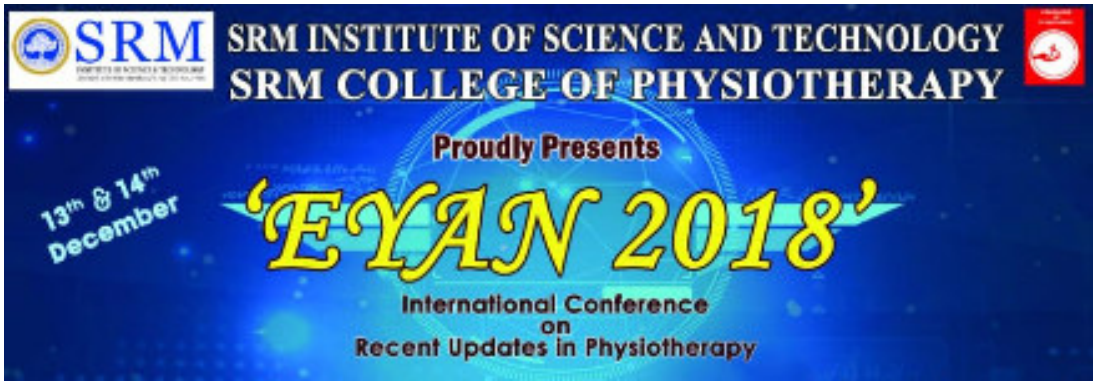

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CONTENT

SP-01

A STUDY TO COMPARE VISUAL VESTIBULAR HABITUATION AND BALANCE TRAINING EXERCISES VERSUS PUMA METHOD IN MOTION SICKNESS

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ABSTRACT

BACKGROUND: Motion sickness is a normal physiological response which causes disorientation and fatigue while travelling. The symptoms can also occur when a visual perception indicates that a motion is taking place, but the body is not actually moving. Motion sickness consists of following of signs and symptoms: drowsiness, dizziness, discomfort, repetitive yawning, stomach upset, nausea, sweating, malaise, vomiting and lack of interest. OBJECTIVE: To compare the effectiveness of visual vestibular habituation and balance training exercises versus Puma method in motion sickness. STUDY DESIGN: Experimental study design. SUBJECTS: 30 subjects were divided into three groups with 10 subjects in each group of age group between 18-26 years. INTERVENTION: 10 subjects in Group-A treated with visual vestibular habituation and balance training exercises, 10 subjects in Group-B treated with Puma exercises and 10 subjects in Group C was control group. OUTCOME MEASURES: Severity of motion sickness in Visual analogue scale (VAS), Motion Sickness Susceptibility Questionnaire-Short form (MSSQ-Short). RESULTS: Statistical analysis was done by using paired 't' test which showed significant improvement in the groups treated with exercise. Group A showed significant improvement than Group C while Group B showed significant improvement than Group A and Group C. CONCLUSION: Puma exercises have shown significant improvement in the treatment of motion sickness.

KEYWORDS: ***Motion Sickness, Visual vestibular habituation, Balance training, Puma exercises.***

INTRODUCTION

The motion sickness was first observed 2000 years ago by the Greek physician Hippocrates. He observed that "sailing on the seas proves that there will be motion disturbance in the human body". In ancient time, only few form of passive motion experienced. But, nowadays passive motions such as car, bus, train and airplane and illusion of passive motion (video games on large screen, virtual reality) are very abundant. So, the symptoms of motion sickness becomes the frequent problem.[1-4] Motion sickness is the normal response of the body which causes disorientation and fatigue while travelling.[5] Motion sickness can also be termed as sea sickness, car sickness, simulator sickness depend on the cause for the symptoms.[6] It is the physiological response occurs in healthy people who are exposed to motion stimuli that are not experienced before.[7] Motion sickness is experienced while travelling in vehicles such as bus, car, boat or airplane.[8] In India, the prevalence of motion sickness was about 28%. The females are more susceptible for the symptoms of motion sickness than males in the ratio of 5:3.[5,9] The symptoms of motion sickness can also occurs when a visual perception indicates that motion is taking place, but the body is not actually moving.[4,10] The syndrome of motion sickness consists of some of the combination of following signs and symptoms:- drowsiness, dizziness, discomfort, repetitive yawning, stomach upset, nausea, sweating, head ache, malaise, vomiting and lack of interest. There is no dysfunction of the visual and vestibular component in the person with motion sickness.[10-12] The individual without labyrinthine vestibular function does not experience motion sickness.[13,14] So, it is understood that vestibular system takes part in producing nauseogenic stimulus. This stimulus can also occurred by the stimuli that doesn't activate the labyrinth such as illusion of passive motion.[15,16] The "Sensory Mismatch Theory" is the widely accepted theory for the causes of motion sickness. According to this theory, the brain combines visual information, proprioception and vestibular information for the balance of the body. These sensory signals are merged in the brainstem and cerebellum

and proceed to obtain the nature of self-motion. When these information's disagree, there will be a conflict in the brain which causes the symptoms of motion sickness.[10,17,18] The eyes are important sensors in the human body. It provides visual information to the brain. The proprioceptors situated in muscles and joints are other sensors that provide information about the position and movement of the body. The most important sensors for balance are called the semi-circular canals located in the inner ear. These canals contain tiny hair like structures which stimulates when there is head movement. The brain receives information from these sensors. Normally, the brain has no difficulty in producing these information's. But when there is any conflicting information, the brain produces the symptoms of motion sickness. During passive artificial motion occurs while travelling, the combinations of these sensory stimuli are found difficult or impossible to be judged by the brain. This is termed as "sensory-conflict".[19-23] The classification of motion sickness is based on the conflicting sensory signal or the sensory conflict occurs between two acute signals. The two major classifications was proposed based on sensory conflict are: [18] Conflict between angular and linear vestibular input, Conflict between visual and vestibular input. When there is conflict between the different signals of the vestibular system without involving visual system it produces vestibular motion sickness. This is termed as vestibular only motion sickness. These conflicts occurs when the signals from semicircular canals provides head rotation and otolith organs provide gravity inertial force vector and integrated. The cross coupled stimulation is the most common form of vestibular motion sickness.[24-26] The semicircular canals in the vestibular system inform us our angular velocity changes but these semicircular canals cannot able to report the constant velocity rotation. The otolith organs in the vestibular system can measure the direction of acceleration but it cannot differentiate between the gravity and inertial force. These conflict within the vestibular system causes vestibular only motion sickness.[27] Cross coupled stimulation is also known as Coriolis-effect. This effect may cause disorientation and motion sickness. It was related to the linear movement of the head in rotating plane. When the head is tilted around a roll axis in earth-vertical yaw rotation, the cross-coupling effect is smaller phase. The head tilt with ongoing yaw rotation active or passive, both area equally disorientating. If these both are performed during locomotion, there is no disorientation or motion sickness.[25,28] The aim of the study is to compare the effectiveness of vestibular habituation and balance training exercises versus Puma method in Motion Sickness. Nowadays, travelling becomes a normal daily activity, which leads to the symptoms of motion sickness in very abundant.[3]. Some studies show that vestibular exercises have good improvement in treating motion sickness. Hence, this study is done to find which types of vestibular exercises have good effect in treating motion sickness.

Materials used

An index card with a letter
A sheet with an horizontal line.
Cushion or pillow.

Procedure

Participants were selected according to inclusion and exclusion criteria. They are asked to sign the consent form. Participants were divided into three groups Group A, Group B and Group C. Each group contains 10 participants. Group A were given visual-vestibular habituation and balance training exercises[9], Group B were given Puma exercises[8] and Group C were control group. No exercises were prescribed for control group. The participants are asked to fill the Motion Sickness Susceptibility Questionnaire –Short form[29] and they are asked to rate their severity of motion sickness in Visual Analogue Scale (0- no symptoms to 10- severe symptoms).[30,31] The prescribed exercises has to be followed once a day, for 5 days a week and for 4 weeks.

Visual-Vestibular Habituation and Balance Training exercises

Sit in a chair; hold an index card with a letter at arm's distance in front of you at eye level. Move the card left to right slowly as you maintain fixation on letters. If you don't feel any symptoms, continue at maximum for 30 seconds. Repeat the same activities but move the card in up and down directions. Now, keep the card steady move your head from left to right focusing on the clear image of the letter in the card. Repeat the previous step but move your head in up and down direction. Repeat the step but move your head in side to side direction. Stand with the support with eyes closed. March in a place and count up to 50. Try to gradually lift the hand. When you are perform the exercise without support try this with arm at your side.

Place thick sofa or cushion on floor and place a sheet of paper with horizontal line 10 to 15 feet away from the place where you standing. March in place on the cushion, as you look at the horizontal line. Count 50.

Puma exercises

Warm up exercises:

Ten hip rotation to right
Ten hip rotations to left
Ten reps of horizontal head rotation
Ten reps of vertical head tilt
Ten reps of lateral head tilt

Gradually increase the speed of the exercise and do these exercises for three sets.

Conditioning exercises

Three to four clockwise spirals
Three to four anticlockwise spirals

Do this exercise for three sets

A figure of eight exercise with upward motion ends.
A figure of eight exercise with downward motion ends.

Do this exercise for three sets.

Outcome measures

Severity of motion sickness in Visual Analogue Scale.
Motion sickness susceptibility questionnaire (MSSQ- Short)

RESULTS

The collected data were tabulated and analyzed using descriptive and inferential statistics. Standard deviation and mean were used to asses all the parameters of the data using paired samples test and independent samples test of statistical package for social science IBM (SPSS) VERSION 22.

Table 1

Comparison of pre test and post test values of VAS for severity of motion sickness and MSSQ-Short among group A treated with visual vestibular habituation and balance training exercise.

GROUP A	MEAN		S.D		T value	Sig.
	PRE TEST	POST TEST	PRE TEST	POST TEST		
VAS	5.90	4.50	1.19	1.43	8.57	.000
MSSQ-Short	25.94	23.22	10.78	9.88	3.17	.011

$p<0.005$, this table shows that there is a significant difference between pretest and posttest values of VAS and there is no significant difference between the pre-test and post-test values of MSSQ-Short($p>0.005$) among group A.

Graph 1

Comparison of pre test and post test values of VAS for severity of motion sickness and MSSQ-Short among group A treated with visual vestibular habituation and balance training exercise.

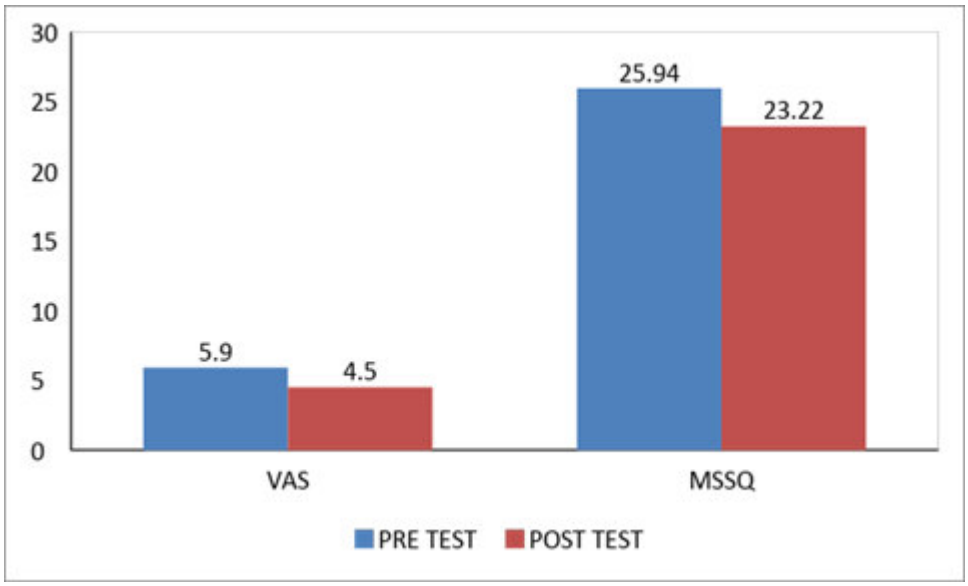


Table 2

Comparison of pre test and post test values of VAS for severity of motion sickness and MSSQ-Short among group B treated with Puma exercises.

Group B	Mean		S.D		T value	Sig.
	Pre test	Post test	Pre test	Post test		
VAS	5.8	3	1.31	1.33	11.22	.000
MSSQ-Short	24.84	19.09	8.42	7.78	9.73	.000

$p<0.005$, this table shows that there is significant difference between pretest and posttest values of VAS and MSSQ-Short form among group B treated with Puma exercises.

Graph 2

Comparison of pre test and post test values of VAS for severity of motion sickness and MSSQ-Short among group B treated with Puma exercises.

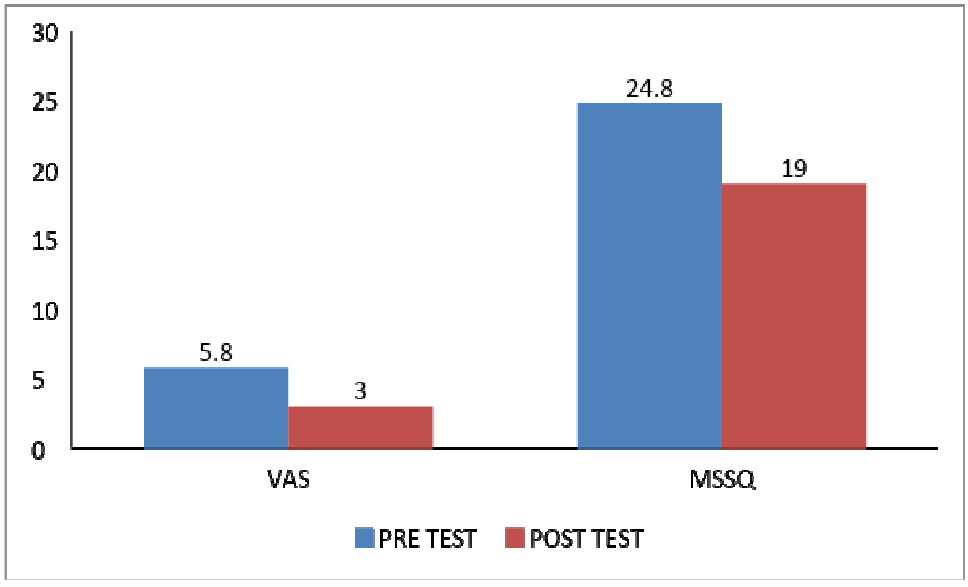


Table 3

Comparison of pre test and post test values of VAS and MSSQ-Short among group C- Control group.

Group C	Mean		S.D		T value	Sig.
	Pre test	Post test	Pre test	Post test		
VAS	5.5	5.5	1.26	1.15	.000	1.00
MSSQ-Short	24.98	24.66	7.70	6.79	0.87	0.40

p>0.005, this table shows that there is no significant difference between pre test and post test values of VAS and MSSQ-Short among group C.

Graph 3

Comparison of pre test and post test values of VAS and MSSQ-Short among group C- Control group.

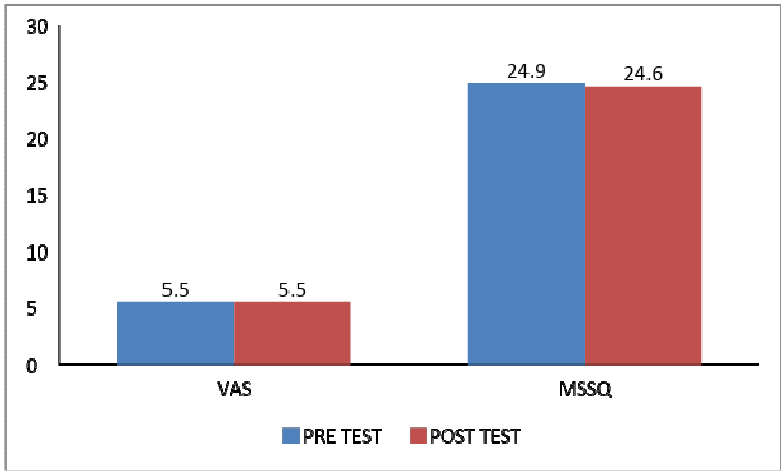


Table 4

Comparison of post test values of VAS between group A, group B and group C.

POST TEST VAS	MEAN	S.D	t value	Sig.
GROUP A	4.5	1.43	9.19	0.01
GROUP B	3.0	1.33		
GROUP C	5.5	1.15		

p>0.005, the table shows that there is no significant difference in post test values of VAS between Group A, Group B and Group C.

Graph 4

Comparison of post test values of VAS between group A, group B and group C.

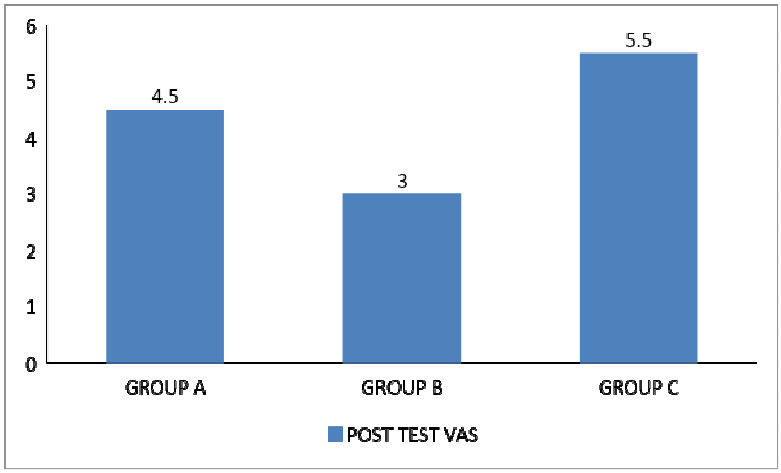


Table 5

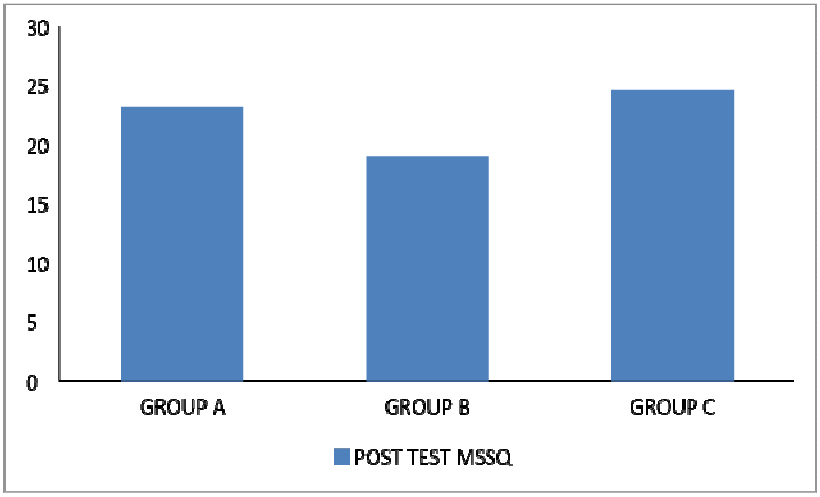
Comparison of post test values of MSSQ-Short between group A, group B and group C

Post test MSSQ-short	Mean	S.D	t value	Sig.
Group A	23.22	9.88	1.22	0.309
Group B	19.09	7.78		
Group C	24.66	6.79		

p>0.005, there is no significant difference between the posttest values of MSSQ-Short form between Group A, Group B and Group C

Graph 5

Comparison of post test values of MSSQ-Short between group A, group B and group C



Visual vestibular habituation and balance training exercise

Figure 1 Maintain eye fixation on letter and the card is moved from left to right.

Figure 2. Maintain eye fixation on letter and the card is moved in up and down directions.

Figure 3. Maintain eye fixation on a letter and the head is moved from left to right.

Figure 4. Maintain eye fixation on a letter and the head is moved in up and down directions

Figure 5. Maintain eye fixation on the letter and move rhe head in side to side directions.

Figure 6. March in plane with eye closed and march in cushion by focusing the horizontal line.

Puma exersices

Figure 7. Hip rotations to left

Figure 8. Hip rotations to right

Figure 9. Vertical head tilt

Figure 10. Horizontal head rotation

Figure11. Lateral head tilt

Figure 12. Clockwise and anticlockwise spirals.

Figure 13. Figure of eight.

TABLE 1: This table compares the pre test and post test values VAS for severity of symptoms of motion sickness and MSSQ-Short among group A treated with visual vestibular habituation and balance training exercises. As $p<0.005$, there is a significant difference between the pre test and post test values of VAS , but there is no significant difference between the pre test and values of MSSQ-Short($p>0.005$). TABLE 2: This table compares the pre test and post test values for VAS for severity of motion sickness and MSSQ-Short among group B treated with Puma exercises. As $p<0.005$, there is a significant difference between pre test and post test values of VAS for severity of motion sickness and MSSQ-Short among group B. TABLE 3: This table compares the pre test and post test values of VAS for severity of motion sickness and MSSQ-Short among group C-Control group. As $p>0.005$, there is no significant difference between difference between pre test and post test values of VAS among group C. TABLE 4: This table compares the post test values of VAS for severity of motion sickness between group A, group B and group C. The post test mean values of group A was 4.5, group B was 3.0 and group C was 5.5. Group B shows significant improvement in the posttest value of VAS than other two groups. As $p<0.005$, there is significant difference on posttest values of VAS between the groups. TABLE 5: This table compares the post test values of MSSQ-Short form between group A, group B and group C. The post test mean values of group A was 23.22, group B was 19.09 and group C was 24.66. Group B shows significant improvement in the posttest values of MSSQ-Short form than other two groups. As $p>0.005$ there is no significant difference on posttest values of MSSQ-Short form between the groups.

DISCUSSION

This study compares the effectiveness of visual vestibular habituation and balance training exercises versus Puma exercises in motion sickness. VAS scale is used to assess the severity of motion sickness and Motion Sickness Susceptibility Questionnaire-Short form (MSSQ-Short) for the susceptibility of the individual for motion sickness in past days. Rose Marie Rine., 1999 conducted a case study for the treatment of motion sickness using vestibular habituation and balance training exercises. He concluded that the patient doesn't experience much motion sickness on 4^{th} week follow up and there is complete relief from the motion sickness on 10^{th} week follow up. He states that habituation and adaptation exercises are very helpful in relieving the symptoms of motion sickness. He also states that though habituation exercises treats motion sickness, this theory requires an experimental design.[13] Cheiranjeevi Janu., 2015 conducted an experimental design in visual vestibular habituation and balance training exercises and concluded that there is a reduced VAS scores in patients with motion who received visual vestibular habituation and balance training exercises for 8 weeks. He also states that Visual-vestibular habituation and balance training exercises are very easy exercises to be performed by the patient. These exercises can performed easily at home and doesn't require any supervision by the therapist.[8] Puma et al., 2007 states that these habituation exercises can be easily performed by the patient and it doesn't require any supervision. The exercises are comprised of

two phases warm up phase and conditioning phase. This exercise requires about fifteen minutes each day and improvement can be seen within 2 weeks.[9] The statistical analysis of this study shows significant improvement in the groups treated with exercise and there is no significant improvement in the control group. The mean value of pre test VAS is 5.9 and posttest VAS is 4.4, pretest MSSQ-Short form is 25.94 and post test MSSQ-Short form is 23.22 among group A treated with Visual vestibular habituation and balance training exercises. As $p<0.005$, there is a significant difference between pre test and post test values among group A. Thus, the result falls in hand with Chiranjeevi Janu, who concluded that Visual vestibular habituation and balance training exercises are effective in treating motion sickness. The mean value of pre test VAS is 5.8 and post test VAS is 3, pre test MSSQ-Short form is 24.84 and post test MSSQ-Short form is 19.09 among group B treated with Puma exercises. As $p<0.005$, there is significant difference between pretest and posttest values among group B. Thus, the results falls in hand with Puma et al. who concluded that these habituation exercises have significant effect in reducing the symptoms of motion sickness. Thus the groups received exercises were shown to have significant improvement in reducing the symptoms of motion sickness. The group which didn't receive any exercise doesn't have any improvement. The mean posttest values of VAS and MSSQ-Short of group A are 4.5 and 23.22. Mean posttest values of VAS and MSSQ-Short of group B are 3.0 and 19.09. Group B who were treated with Puma exercises shown to have reduces posttest values of VAS and MSSQ-Short form than Group A who were treated with Visual vestibular habituation and balance training exercises. Though group A have significant improvement in reducing the symptoms of motion sickness, it is minimal when compared to Group B who were treated with Puma exercises. Puma exercises (Group B) were shown to have significant improvement in reducing the symptoms of motion sickness than Visual vestibular habituation and balance training exercises within four weeks of exercise protocol.

CONCLUSION

This study concludes that Group B participants treated with Puma exercises have shown to have significant improvement in treating motion sickness than Group A participants who were treated with Visual vestibular habituation and balance training exercises within four weeks exercise protocol. Thus, this study concludes that Puma exercises have significant effect in treating motion sickness.

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SP-02

EFFECT OF PASSIVE, ACTIVE AND COMBINED WARM UP ON LOWER LIMB OF HEALTHY INDIVIDUALS

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ABSTRACT

Aim of the study is to determine the effect of passive, active and combined warmup on lowerlimb of healthy individuals. Methodology of the study is 30 individuals based on inclusion and exclusion criteria. Detailed procedure will be explained in patient words and informed consent will be obtained from all participants. Effect of active, passive and combined warm up will be evaluated in the subjects. The post-test value will be taken after four weeks. The results we determined from the static analysis has been revealed that there is a significant improvement in physical fitness of combined warm up group than the active and passive warm up separately. In the vertical jump test for passive warm up group, the pre-test mean is 37.71, with the standard deviation being 6.53 and the post-test mean being 38.24 with a standard deviation of 6.60. And for the active warm up group, the pre-test mean is 38.69, with the standard deviation being 6.606 and the post-test mean being 39.4 with a standard deviation 6.65. And for the combined warm up group, the pre-test mean is 38.94, with the standard deviation being 7.12 and the post-test mean being 40.57 with a standard deviation of 6.88.Hence, we conclude that it has been proved statistically that although improvements have been observed in three groups, the improvement is much more significant in the combined warm up group.

Key words: ***active warm up, passive warm up, vertical jump test, healthy individuals.***

INTRODUCTION

Physical inactivity is a term used to identify people who do not get the recommended level of regular physical activity. The WHO (WorldHealth Organisation) reported that around 3.2 million deaths each year are attributable to physical inactivity (DA ouakrin et al.,). The leading global risk for mortality in the world are high blood pressure (13%), tobacco use (9%), high blood glucose (6%), physical inactivity (6%), and overweight and obesity (5%) (nelson et al.,2007). Warm up is usually an integral part which helps the body and mind for workout. Any activity thatincreases the body temperature for few degrees Celsius is called a warm up (Andrade et al.,2015). Warm up can be classified into active warm up and passive warm up (McGowan C et al., 2015). The effect of heating on the contractile properties of skeletal muscle have been studied. It is clear that increasing muscle temperature increases the speed of muscle contraction, and decreases both time to peak tension and half relaxation time (susangray et al., 2001). Active warm up is a dynamic stretching that activates muscles we use during workout (Gray SC et al.,2002). Passive warm up involves raising muscular or core temperature by some external means without depleting energy substrates.(kedargogte et al.,2017).Active arm up significantly increases the concentration of the muscle acetylcarnitine before the onset of exercise. The accumulation of large preexercise store of mucle acetylcarnitine provides extra substrate for oxidative ATP production at the onset of exercise (Greenhaff, P. L., et, 1998). The active warm up incorporates within itself a whole series of physical activities by riding an unloaded lower extremity bicycle ergometer set up at a speed of 60minutes/second for 15 minutes. The passive warm up was given by infrared light to lower limb muscle for 15 minutes. Combined warm up includes both. Active warm up helps in increase in blood flow, increase in oxygen consumption and leads to breaking of actin and myosin bonds which improves flexibility (marshallpw et al., 2015). Passive warm up helps in improving athletic performance by increasing flexibility, increase in metabolism of energy system, increase in oxygen releasing tissues, increase in nerve conduction velocity, reduction in peak tension time in muscle, it increase the temperature strain on the body and can help in increasing performance (ross et al., 2001). Combined warm up provides both. So the warm up is widely used by trainers and physical therapist

before a range of exercises and athletic performance (emilianoCe et al., 2008). There was also an hypothesis that the warm up may involve some psychological effects such as increased preparedness (bishop D et al., 2003). These conflicts results as a lack of studies, as far as we know, evaluating the effect of active warm up + passive warm up on the muscular performance prompted the study. Our final aim is to provide practical suggestions to trainers, coaches, and sports medicine physicians on the use of active warm up combined with passive warm up to increase muscular performance.

METHODOLOGY

The study is designed as Quasi experimental Design, study setting is done at Saveetha College of Physiotherapy, thandalam. Sample size was 30 healthy students. The inclusion criteria were both the gender were taken between age group of 19-23 years without any significant musculoskeletal issues and risk for cardiovascular complications during exercise and absence of any other medical condition which could preclude from exercise were included. The exclusion criteria are those who have contraindications to infrared radiations, musculoskeletal disorders affecting lower extremities that will prevent the subject from using bicycle ergometer, cardiovascular disorder such as angina, valvular disease, arrhythmias. The materials required are bicycle ergometer set at a speed of 60meters/second for 15 minutes, infrared lamp, stop watch, inch tape. Procedure, a total of 30 samples were selected according to the inclusion and exclusion criteria. The safety and simplicity of the entirety of the procedure will be explained before handed. All of 30 samples will be randomly selected using the convenient sampling techniques. The participants were randomly divided into three groups. Active warm up group, n=10 participants, passive warm up group, n=10 participants, and combined warm up group, n=10 participants. All 30 of the samples were undergoing vertical jump test. In the vertical jump test, the person stands side on to a wall keeping the feet flat on ground and reaches up, the point of fingertip is marked. This is called standing height. The person then stand away from the wall and leaps vertically as high as possible. The difference in distance between the standing reach height and jump height is the score. The best of three attempts is recorded.

RESULT

From the statistical analysis, it has been revealed that there is a significant improvement in physical fitness of combined warm up than the active and passive warm up separately. In the vertical jump test for the passive warm up, the pre-test mean is 37.71 , with the standard deviation being 6.538 and the post-test mean being 38.24 , with a standard deviation of 6.60, and for the active warm up, the pre-test mean is 38.69 , with the standard deviation being 6.66 and the post-test mean being 39.4, with a standard deviation of 6.65, and for the combined warm up, the pre-test mean is 38.94 , with the standard deviation being 7.12 and the post-test mean being 40.57 , with a standard deviation of 7.25.

Table 1
passive warm- up group

Vertical jump test	Mean	Standard deviation	P- Value
Pre-test	37.71	6.53	
Post-test	38.24	6.60	P<0.001

The data from the above table showsthe pre-test and post-test values of VERTICAL JUMP TEST FOR PASSIVE WARM UP GROUP. The pre-test mean value of this test is 37.71 (SD is 6.53) and post-test mean value is 38.24 (SD is 6.60) with p value (<0.001) statistically significant.

Figure 1: V*ertical jump test for passive warm up group*

Table 2: A*ctive warm up group*

Vertical jump test	Mean	Standard deviation	P-Value
Pre-test	38.69	6.66	
Post-test	39.4	6.65	P<0.001

The data from the above table shows the pre-test and post-test value of VERTICAL JUMP TEST FOR ACTIVE WARM UP GROUP. The pre-test value is 38.69 (SD is 6.66) and the post-test mean value is 39.4 (SD is 6.65) with p value (<0.001) statistically significant.

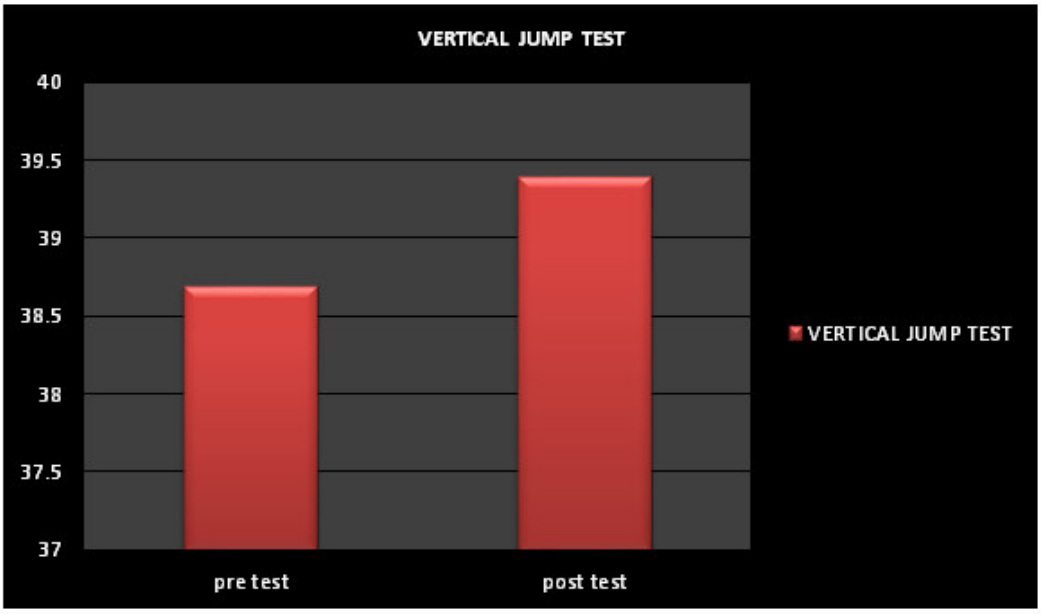

Figure: 2 *Vertical jump test for active warm up group*

Table 3: *Combined warm up group*

Vertical jump test	Mean	Standard deviation	P-Value
Pre-test	38.94	7.12	
Post-test	40.57	6.88	P<0.001

The data from the above table shows the pre-test and post test values of VERTICAL JUMP TEST FOR COMBINED WARM UP GROUP. The pre-test mean value is 38.94 (SD is 7.12) and post-test mean value is 40.57 (SD is 6.88) with a p value (<0.001) statistically significant.

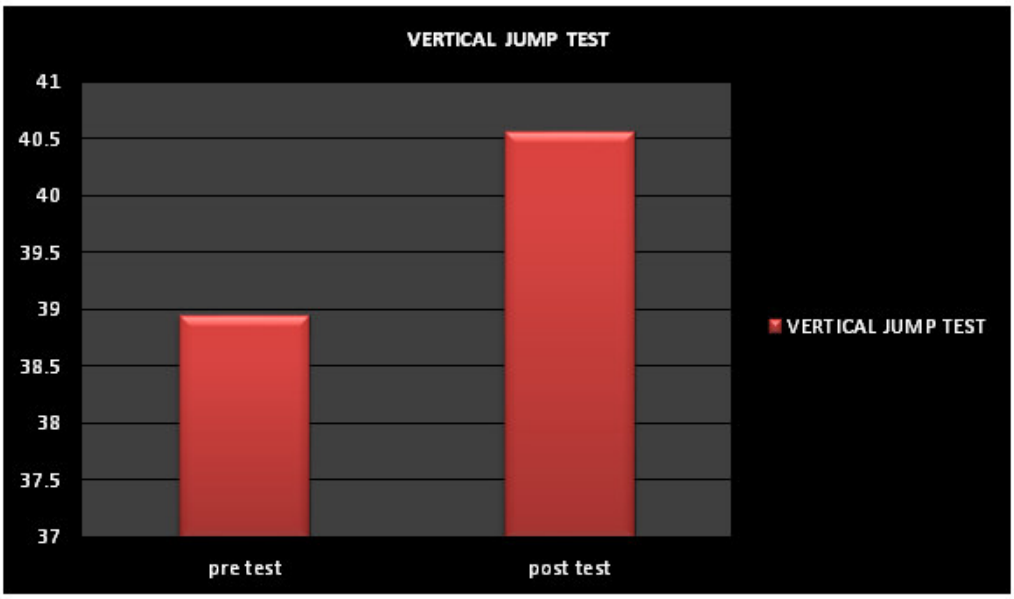

Figure: 3 ***Vertical jump test for combined warm up group***

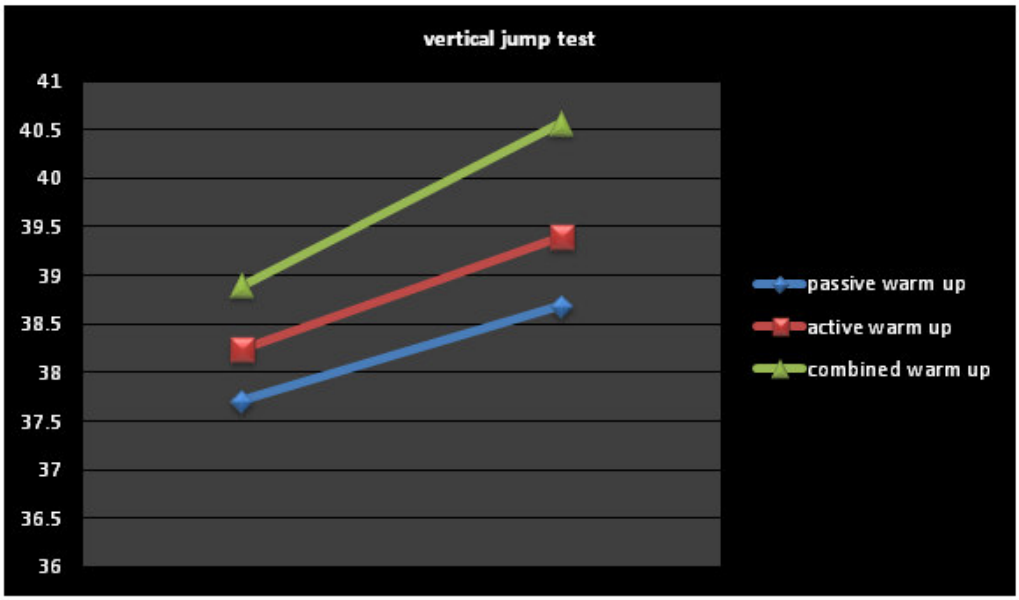

Figure 4: ***Comparison of passive, active and combined warm up.***

DISCUSSION

The present study aimed to investigate the effect of 4 weeks active warm up and active warm up in healthy individuals on physical activity. This study was detailed on 30 healthy individuals. The results of the present study demonstrate that, after a combined warm up, there is an increased effect of which combined warm up of active and passive comparatively better among the other two groups comprising of 10 participants each, group A received active warm up and group B received passive warm up. Measurements were assessed using vertical jump test (Sargent, D.A.1921). In this test the subject stands in the position with the arm extended above the head as high as he could by keeping his soles of the feet in a plain surfacewithout elbows and knees, next to the graduated surface. The participant was asked to mark with his fingers the highest position he could reach. To facilitate reading the fingers of each individual were marked with colour powder. The jumping was performed by freely flexed lower limbs as well as move the upper limbs for the excursion of the jump to provide the greatest possible thrust. Each participant performs three jumps and the

greatest value is considered (Bosco, C et al,1983). The data that presented normally were expressed as mean and standard deviation. Figure 1, figure 2, figure 3 presents the correlation between the pre-test and post-test values of passive warm up group, active warm up group and combined warm up group respectively. It shows that combined warm up have significant improvement on comparing with passive warm up group and active warm up group. The limitations of my study, was the small sample size of 30. Only younger age group were included. The study can also be conducted for a longer duration like 6 weeks for obtaining further information, if any. Future recommendations are, a future study can be done with a larger population and in a longer duration. Older age people might be included.

CONCLUSION

From the results, it has been proved statistically that although improvements have been observed in three groups, the improvement is much more significant in the combined warm up group than it is in the passive warm up and active warm up separately.

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SP-03

PREVALENCE OF FUNCTIONAL HALLUX LIMITUS AMONG COLLEGE STUDENTS USING HIGH HEELS

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ABSTRACT

BACKGROUND: The functional hallux limitus is defined as the limitation of dorsiflexion of the proximal phalanx of the great toe during walking, despite there will be normal function of this great toe during non-weight bearing .In high heels users it is more common due to undue stress over the ball of the foot causes the limitation of the movement .Thus there are various problem arises in girls wearing high heels. Hence lot of studies explained about the malalignment of the posture, heel pain in women using high heels. OBJECTIVE: The aim of the study is to find the prevalence of functional hallux limitus among college students using high heels. STUDY DESIGN: Non-experimental design. METHODOLOGY: According to the inclusion and exclusion criteria samples were selected. The prevalence of functional hallux limitus is assessed using the functional hallux limitus test and goinometer is used to check the ROM. RESULTS AND CONCULSION: Among 100 college students using high heels, 67% of the girls have the limitation of great toe extension. This is due to prolonged use of high heels hence this functional hallux limitus may further lead to hallux valgus, hallux rigidus and in severe cases it may also cause sesamoiditis.

KEYWORDS: ***Functional hallux limitus, College students, Range of motion (ROM)***

INTRODUCTION

Functional hallux limitus is defined as the limitation of dorsiflexion of the proximal phalanx of the great toe during gait. Functional hallux limitus (FHL) is a pathology that described in 1972, have a normal range of hallux dorsiflexion during non-weight bearing but there is a decrease in hallux dorsiflexion during weight bearing. In normal individual during weight bearing the ROM of the great toe dorsiflexion in propulsive phase is between 65◦ and 75◦ but in functional hallux limitus this ROM is reduced. If this limitation of movement persists, it leads to hallux rigidus and also osteoarthritis of the joint will result. Dudley Morton described that main cause for this foot dysfunction is associated with first ray hyper mobility because this 1st MTP joint only helps to prevent the first ray from contact on the floor during gait. Recently studies have been described that this hyper mobility contributes less common than believed because this hallux limitus is also present in healthy individuals wearing high heels and tight shoes or boots. This will create an undue pressure over the foot. Hence this study has been done among the college students wearing high heels more frequently. The weight distribution is altered between bare foot and individual wearing high heels. In bare foot the weight is distributed equally on the ball of the foot and heel of the foot i.e. 50% over the ball of the foot and 50% on the heel, but while wearing high heels there will be impaired in this ratio i.e.90% over the ball of the foot and only 10% on the heel. When standing erect or even in sitting wearing heels causes the weight is shifted forward to the ball of the foot. Thus this forefoot is not that much have the potential energy to withstand this pressure. This pressure results in excessive strain on the muscle, ligament, tendon complication and also restricted ROM.

MATERIALS AND METHODS

The goinometer is the instrument which is used to measure the ROM of the dorsiflexion of the great toe .The functional hallux limitus test is done to detect whether there is limitation in the movement of the big toe.

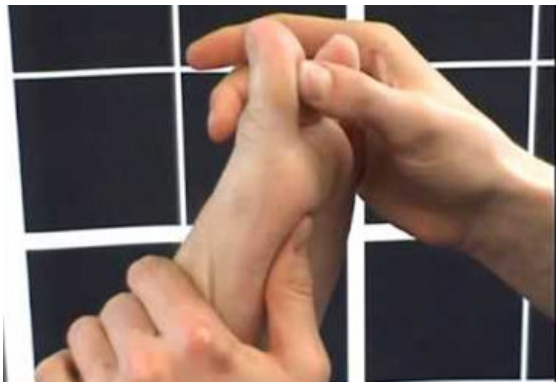
Functional hallux limitus test

The functional hallux test has a 0.72 sensitivity means that 72%of feet with a pronated midtarsal joint also the test being positive for functional hallux limitus. A specificity of 0.66 was reported as 66% of feet with normal midtarsal joint motion shows a negative test result

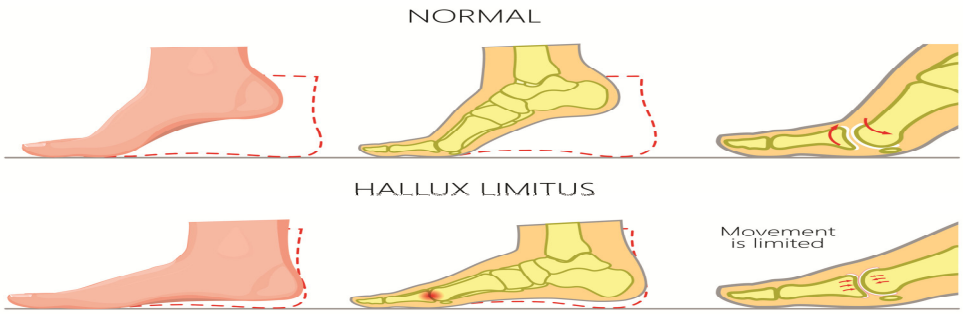
Procedure

The participants were selected according to the inclusion and exclusion criteria. College girls of age around 18 to 22 years and wearing high heels for at least 1 year or at least 6 to 7 times a month were included in this study and those with any musculoskeletal disorders i.e. any fracture on the leg and foot, infections such as paronychia, onychomycosis, any neuromuscular conditions and those who are not willing to participate are excluded in this study. The patient should be in a non-weight bearing position. The foot was held in dorsiflexion with the foot maximally pronated but not in subtalar neutral position. An axial load, stimulating ground reaction force was applied under the first metatarsal head. This was done with the thumb of the examiner hand medial to the first metatarsal. This load was relatively firm, considering the body weight going through the foot during stance. If the force is inadequate, the test will be difficult to interpret. The thumb of the opposite hand of the examiner should dorsiflex the proximal phalanx of the hallux. The test is positive if examiner noted immediate plantarflexion of the first metatarsal upon dorsiflexion of the proximal phalanx. The goinometer is used to assess the ROM .The axis should be placed over the head of the 1st metatarsal, stationary arm should towards the medial side of the leg and moving arm is pointing towards the proximal phalanx of the great toe or hallux.

This how the test to be done:

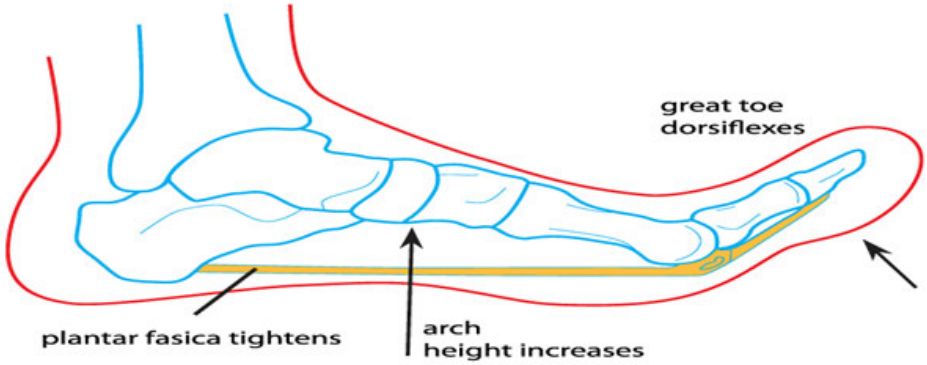


This picture defines the difference between the movement of the normal foot and hallux limitus foot



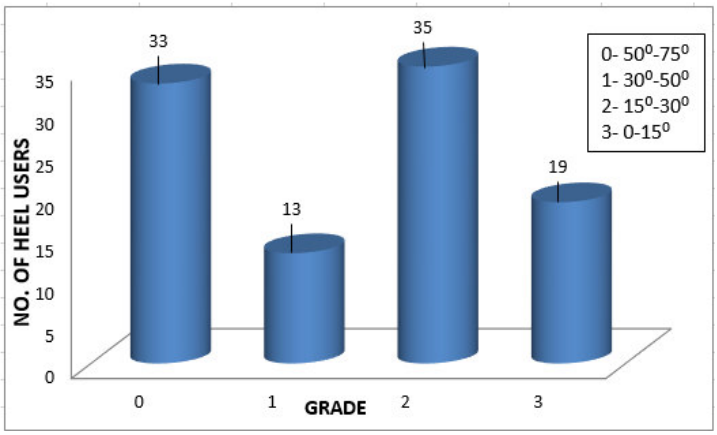
The Windlass Mechanism

This mechanism takes place during the dorsiflexion of the proximal phalanx of the great toe, when this mechanism is activated there are certain changes takes place they are 1.The arch appears to rise 2. The posterior part of the foot will be in present in an inverted position 3. There will be lateral rotation of the leg 4.and there appears to be a tight band in the region of the plantar fascia. Hicks discovered that the arch that rises during propulsion will not be dependent on muscle function and often related to the dorsiflexion of the toes.



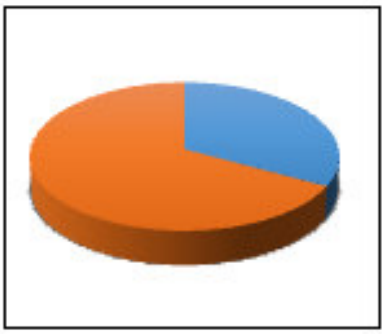
DISCUSSION

The purpose of the study is to the find relationship between the restriction of movement and the high heels. Due to prolonged plantar flexion of the foot while wearing high heels in gait as well as standing causes too much load on the lower extremities and the back .while wearing high heels the heel is raised this causes the shortening of muscle fibres that innervates the muscle (Gastrocnemius and soleus). This muscle becomes inconsistent and thus less favourable position on its length-tension curve. Inclination of the foot in high heels causes disappropriate weight distribution. This causes the weight to be transmitted to the ball of the foot when standing erect or even sitting, but the forefoot cannot able to withstand this greater quantity of potential energy for a prolonged period of time. This results in muscle strain, ligament and tendon complications and fatigue. As the heel height and the duration of the wearing increases, there is an increase in the limitation of the movement. This table 1 shows the number of heel users and their level of limitation.



RESULT

From the Table 1:
It shows that 33% of the girls wearing high heels have the normal ROM 65˚to 75˚,
23% of the girls wearing high heels have the ROM ranging from 30˚ to 50˚
29% of the girls wearing high heels have the ROM ranging from 15˚to 30˚
Then 15% of the girls wearing high heels have the ROM ranging from 0˚to 15˚



- Red indicates- Restricted great toe extension (67%)
- Blue indicates- Normal great toe extension (33%)

CONCLUSION

From this study we have concluded that girls wearing high heels have the Functional Hallux Limitus. Furthermore using of the heels leads to Hallux Valgus and Hallux Rigidus, in chronic cases it may also lead to sesamoiditis. It causes exaggerated pain during the dorsiflexion of the metatarsophalangeal joint. The limitation and recommendation of this study is we have selected participants irrespective of their height of the heels hence further studies can be done on the professionals those who wear heels daily in a particular height in order to get a accurate result.

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SP-04

COMPARING THE EFFECTS OF BODY MASS INDEX AND FEAR OF FALL ON FUNCTIONAL MOBILITY IN ELDERLY

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ABSTRACT

Fear of falling in elderly is a major cause of loss of independence, which has an effect on the physical function in them. The focus of the study is to compare the effects of BMI and fear of fall on functional mobility in elderly. The sample consisted of 30 community dwelling elderly people of age ≥65 years. Fear of falling was measured using modified falls efficacy scale (MFES) and functional mobility was assessed using the Timed Up and Go test (TUG). The data was analyzed using paired t-test and independent t- test to examine the relationship between MFES, BMI and TUG test. The paired samples test of TUG between overweight and normal BMI were .008 which showed a high correlation between them with the significance of $p < 0.01$.The correlation between the MFES of overweight and normal BMI was 0.975 with the significance of $p > 0.05$ which also showed no significant correlation between them. The independent T – Test compared the BMI, MFES (modified falls efficacy scale). It was 0.975 with significance of $p > 0.05$ which also showed no significant correlation between them. The independent T – Test compared the BMI, TUG (Timed up and go test). It was .001 which showed a high correlation between them with the significance of $p < 0.01$. The present study concluded that the functional mobility is decreased in overweight individuals than normal and both have lack of fear.

KEYWORDS: ***BMI, fear of fall, functional mobility, elderly***

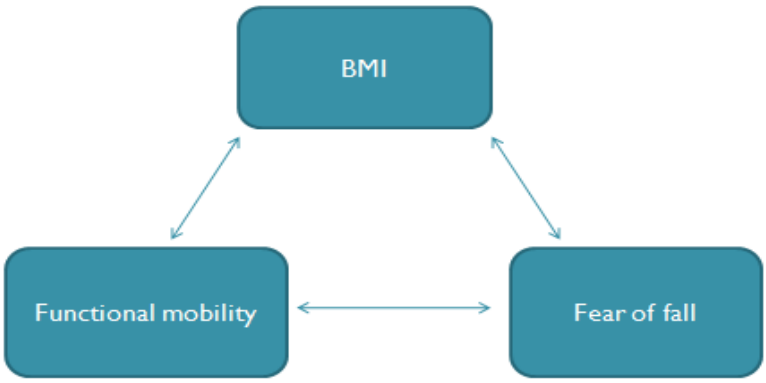
INTRODUCTION

YOU DO NOT HEAL OLD AGE; YOU PROTECT IT; YOU PROMOTE IT; YOU EXTEND IT
- SIR JAMES STERLING ROSS.

The aging is a natural process, mainly characterized by increased fat mass and concomitant reduction in lean mass[1]. The age above 65 years is considered as elderly. The skin wrinkles with years but the soul wrinkles by the anxiety, worry, fear, doubt and self distrust[2]. Elderly people have common geriatric problems like impaired mobility, falls, impaired cognition, urinary incontinence, etc. falls are common events in their lives[3].Nationally, one-third of adults >65 yr old and nearly half of those >80 yr old fall every year[4]. Interestingly fear of falling also leads to the falls. People who have fear of fall change their gait, decrease their activity, or more chance to use assistive devices to prevent falling. The fear of falling can leads to de-conditioning and overall decrease in strength due to decrease in activity and walking [3].The fear of fear is not limited to people who have history of fall[5]

Figure 1

Illustration of interactions between BMI, functional mobility and fear of fall

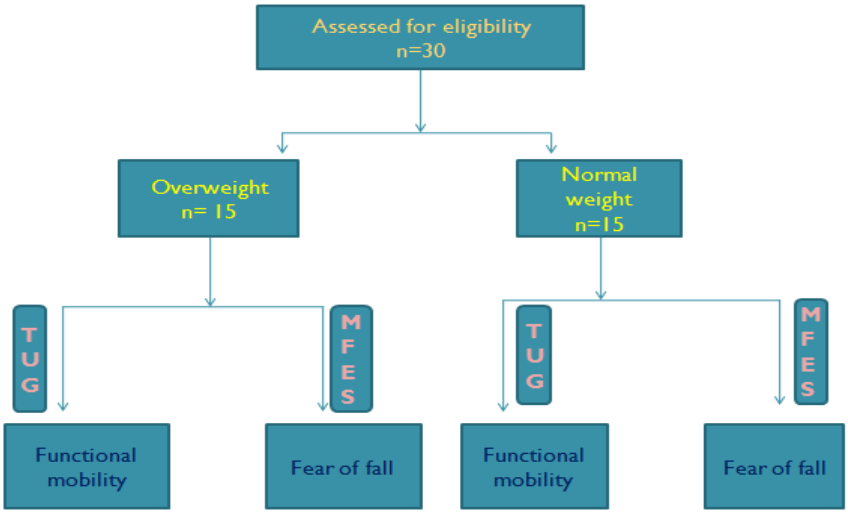


In many countries across the world, the prevalence of overweight and obesity in adults is increasing. Excessive body weight can cause chronic health conditions such as diabetes, cardiovascular disease, hypertension and arthritis, and can also decrease the performance in the activities of daily living[6]. When a person is able to do physical activities at home, school and in the community thereby increasing their health related quality of life[7]. One study discussed that in modern society, elderly people tend to have a high BMI due to excessive nutritional intake and low activity levels, and the relationship between falls and obesity needs to be studied continuously. People with age above 65 years show more than 25% muscle loss and approximately 50% in people over 80 years old. This change in the muscle mass affects functional movement and increases the fear of falling. Previous studies has predicted that fear of falling associated with activity limitation is a predictor of future falls, reduced functional capacity and increased dependency[8]. Due to the lack of studies on the relation between BMI, fear of fall and functional mobility in elderly, there is a need to find out the relationship. By understanding the relationship will help to improve health related quality of life of elderly that helps them to live and function independently.

MATERIALS AND METHODS

This cross sectional study was conducted in elderly people fulfilling the criteria, from the tertiary hospital, Mangalore. The sample consisted of 30 community dwelling elderly people of age ≥ 65. All participants were able to walk without human assistance and were able to follow the instructions given to them. The eligibility criteria were as follows: age ≥65 years, normal weight (BMI between 18.5- 24.9 kg/m2, overweight (BMI between 25.0 - 29.9 kg/m2). Subjects who are under normal weight (BMI< 18kg/m2), Obese (BMI≥30kg/m2) and who had unstable cardiac disease (e.g., angina), respiratory conditions requiring oxygen supplementation or frequent use of inhalers, documented dementia or significant clinical depression, history of neurological disease (e.g., Stroke, Parkinson disease) and history of fracture within the previous 6 months (especially spinal or hip fracture) were excluded. Prior to the beginning of testing, the purpose and procedures of the study was explained to all participants and all participants provided written informed consent. BMI of each individual was calculated and classified the individuals into overweight and obese.[9] Then the modified falls efficacy scale (MFES) questionnaire was administered through interview. Following the interview, functional mobility was assessed by timed up and go test (TUG).

Figure 2



Modified Falls Efficacy Scale (MFES): The MFES scale is a visual analog scale in which items are scored from 0 to 10, with 0 meaning "not confident/not sure at all," 5 being "fairly confident/fairly sure," and 10 being "completely confident/completely sure." Total the ratings (possible range = 0 – 140) and divide by 14 to get each subject's MFES score. Scores of < 8 indicate fear of falling, 8 or greater indicate lack of fear.[10] Timed Up and Go Test **(**TUG**)**: Participants instructed to rise from the chair an armless chair, walk 3 m forward, turn around, return, and sit down. The participants performed TUG at their usual pace. Timing was calculated from when the participant rose from the initial sitting position at the go command to return to sit down.[11]

RESULT

The Paired T – Test was used to examine the relationship among the BMI, MFES (modified falls efficacy scale) and TUG (Timed Up and Go test).The paired samples test of TUG between overweight and normal BMI were .008 which showed a high correlation between them with the significance of $p < 0.01$. (Table 1)

Table 1

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Over Weight and Functional Mobility – Normal BMI and Functional Mobility	6.33333	7.96122	2.05558	1.92456	10.74211	3.081	14	.008

The correlation between the MFES of overweight and normal BMI was 0.975 with the significance of $p > 0.05$ which also showed no significant correlation between them. (Table 2)

Table 2

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Over Weight and Fear of fall - Normal BMI and Fear of fall	-.02000	2.46930	.63757	-1.38745	1.34745	-.031	14	.975

Mean test scores (±SD) for the sample were as follows: BMI 1.62035±1.69093, MFES 0.73724±2.37471 and TUG 4.18842±5.44409 seconds. The independent T – Test compared the BMI, MFES (modified fall efficacy scale). It was .975 with significance of p> 0.05 which also showed no significant correlation between them. The independent T – Test compared the BMI, TUG (Timed up and go test). It was .001 which showed a high correlation between them with the significance of p < 0.01. (Table 3)

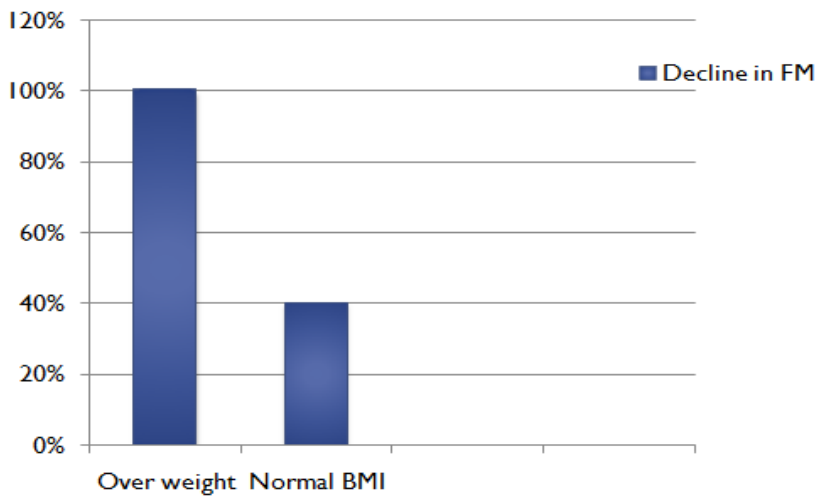
Table 3

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Fear of fall	Equal variances assumed	1.441	.240	.031	28	.975	.02000	.64202	-1.29511	1.33511
	Equal variances not assumed			.031	16.674	.976	.02000	.64202	-1.33656	1.37656
Functional mobility	Equal variances assumed	.822	.372	-3.571	28	.001	-6.33333	1.77353	-9.96624	-2.70043
	Equal variances not assumed			-3.571	26.273	.001	-6.33333	1.77353	-9.97702	-2.68964

Graph 1

Comparison of decline in functional mobility and BMI



DISCUSSIONS

The aging is associated with important changes in the body. Increased body fat can compromise the health and quality of life. Excessive weight is a growing and costly problem that requires public attention. Mobility is a person's ability to move himself or herself independently and safely from one place to another. Mobility limitations hinder the ability to manage tasks of daily life and may lead to the need for help and an increased risk for disability. The fear of falling is one of the most significant factors that increase the risk of fall and it can lead an individual to avoid activities that he/she remains capable of performing. It is a serious and common problem among aging individuals. The result of this study showed the association between BMI, fear of fall and functional mobility in the elderly people. Among 30 elderly people, 15 overweight individuals showed 100% decline in functional mobility and lack of fear and 15 normal weight individuals showed 40% decline in functional mobility and 60% good mobility and lack of fear.TUG assessed ability to maintain balance during timed locomotion and ambulatory transfers. It correlates with BMI demonstrating that a relationship existed between BMI and functional mobility in the elderly population. The result also demonstrated that the study couldn't find a relationship between BMI and fear of fall and also fear of fall and functional mobility. The results of study are comparable with the results of other studies in this area. E Zoico.et, al.conducted a study that shows high body fat and high BMI values were associated with a greater likelihood of functional limitation in a population of elderly women at the high end of the functional spectrum.[12] Jenkins KR suggested that several studies have analyzed the relationship between body weight and functional impairment showing that extreme high or low body weight is associated with poorer physical functioning.[9] Daphne P Guh.et,al concluded that both overweight and obesity are associated with the incidence of multiple co-morbidities including type II diabetes, cancer and cardiovascular diseases. Maintenance of a healthy weight could be important in the prevention of the large disease burden in the future. Further studies are needed to explore the biological mechanisms that link overweight and obesity with these co-morbidities.[13] H.K. Vincent.et, al.concluded that obesity is consistently associated with mobility disability in older adults. Available evidence indicates that increased adiposity combined with the relative or absolute reduction in skeletal muscle influences the development of mobility and functional impairments.[14] Further study should focus on BMI, fear of fall and functional mobility in wide samples of subjects. This relationship can help the well being of elderly.

CONCLUSION

This study has shown that overweight individuals aged 65 years and older have decreased functional mobility than normal individuals and both have lack of fear. This study couldn't find a relationship between BMI and fear of fall and also fear of fall and functional mobility. This result can provide information for developing rehabilitative programs to improve health related quality of life of elderly that helps them to live and function independently. Further research is required to expand the relationship of the current study.

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SP-05

PREVALENCE OF REPETITIVE STRAIN INJURIES AMONG SALOON WORKERS

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ABSTRACT

BACKGROUND: Saloon workers are one of the occupational group in the society. These lead to the highest prevalence of repetitive traumatic and musculoskeletal disorders. OBJECTIVE: To find the prevalence of repetitive strain injuries among saloon workers the most common repetitive strain injuries among saloon workers. METHODOLOGY: Study design was Non-Experimental observational type, men age of 20-35 was included in the study, Subjects with recent fracture subjects were excluded. 100 samples are collected according to inclusion and exclusion criteria. Samples are analysed with NORDIC questionnaire and statistics are done using IBM SPSS 3620. RESULTS: Percentage of discomfort is seen in shoulder (72%), lower back (70%) Upper back (54%) of the body, Percentage of discomfort is seen lower back (75%), upper back (71%) region and Percentage of discomfort is seen in Shoulder (82%), Lower back (75%) upper back (71%). CONCLUSION: This study concludes that prevalence of repetitive strain injuries in saloon workers is predominantly in lower back , upper back and shoulders due to variant changes in ergonomics and the awareness among them is comparatively less**.** Hence, insisting and providing ergonomic advice to saloon workers will be helpful in preventing musculoskeletal disorders in future.

KEYWORDS: ***Saloon workers, Repetitive strain injuries, NORDIC Questionnaire.***

INTRODUCTION

Saloon workers (barbers) are those who mainly deals with cosmetic treatments which include hair styling, skincare and massaging technique[1]. The workplace is exposed with variety of hazards .These consists of chemical agents, physical agents and ergonomic hazards [2]. During work the subjects might adopt improper posture and they work for long period of time which may cause musculoskeletal disorders and it has been described as a common causes for physical disability and pain that may affect many people in the world.[3] Cumulative trauma disorder is a condition where a part of the body is injured by repeatedly overusing or putting stress on that body part. The dysfunction and pain which is characterized to describe the range of conditions is Repetitive Strain Injury (RSI).The pain starts mostly in the hands distally and radiating through proximally to the wrist. The pain is often like "burning". It may be also accompanied with sensory disturbances, tenderness and autonomic dysfunction. Repetitive strain injuries are the most common self-reported work-related illness.[4] Different terminologies used to describe Work related musculoskeletal problems such as Cumulative Trauma Disorders (CTDs), Repetitive Strain Injury (RSI), Repeated Motions Injury (RMI) and Occupational Overuse Disorders (OOD)s[5].Repetitive strain injury is a general term used to describe the difficulty felt in muscles, nerves and tendons. These are conditions associated with repetitive tasks, awkward positions etc. Repetitive strain injuries have been described as the most common cause of severe long term pain and physical disability that may affect hundreds of million people across the world[6]. Due to the repetitive strain injuries many of the people are affected across the world, the most common effect is physical disability and long time pain. The microscopic tears occurs due to repeated fine movements done through hour after hour, day after day thousands times .Usually it strain tendons and muscles in fingers, wrist, and forearms. There may be a decrease in range of motion due to injured muscle contraction. It may affect wrist, hands, back and neck. The occupational diseases induce pathological conditions by long time work, working environment and harmful material inherent. The hazardous work situation is continuous, repetitive often with forceful manner and mostly when the time for recovery is very less. Among saloon workers, contributing factors to repetitive strain injuries are mechanical pressure, repetitive hand exertions7, The occupational activities like how many days they work in a week ,how much

time they work, how many years the subject was doing saloon work all these form an important aspect in creating musculoskeletal complication. The traumatic injuries due to accidents are not considered to be repetitive strain injuries. Repetitive strain injuries are associated with patterns that include: (1) Fixed or constrained body positions.(2) Continual repetition of movements. (3) Force concentrated on small parts of the body, such as the hand or wrist. (4)A place of work that does not allow sufficient recovery between movements.[8] In India according to our knowledge, there was no previous study done to find out the occupational health problems among saloon workers, in long hours with conditions such as poor ventilated and illuminated. In Tamil-nadu, India research done on saloon worker/barbers to find the prevalence of repetitive strain injuries is not available. Hence the study is done to find the prevalence of repetitive strain injuries among saloon workers /barbers in and around Chennai.

Aim of the study

To find out the prevalence of Repetitive Strain Injuries among saloon worker.

Need for the study

The need for the study was to find out the repetitive strain injuries faced by saloon workers. The prevalence of repetitive strain injury is quite important as it affect the quality of life and quality of work among these workers, further more this study may give the knowledge on the most affected area and thus ergonomics or postural advices can be given to prevent the occurrence of injury. Also as there are limited studies among saloon workers, hence this study was done to promote awareness among saloon workers and document the prevalence of Repetitive Strain Injury.

Methodology

It was an observational study, convenient samples were taken, saloons in and around Chennai, the subjects aged between 20-35 years, only men are included in this study, experience should be more than 3 years were included and the participants had any recent injuries or trauma less than 3 month, those who underwent recent surgeries, any other musculoskeletal disorders, autoimmune disorders such as Rheumatoid Arthritis, Psoriatic Arthritis, etc are excluded in this study.

Procedure

The Subjects were selected according to inclusion and exclusion criteria. The whole procedure was explained clearly in detail to the subjects and written informed consent form was taken from each subjects. Demographic data such as name, age, sex, nationality, town, city, was taken. Nordic questionnaire was given for the subjects. True markings and response are encouraged from the subjects. The questionnaire consists of three questions for evaluating trouble with the locomotive organs. The whole body is divided into nine regions.

1) Have you at any time during last 12 month had trouble (ache, pain, discomfort, numbness).
2) Have you at any times during last 12 month been prevented from doing your work (at home or away from home) because of the trouble.
3) Have you had trouble at any time during the last 7 days?

The subjects are assessed by their age, gender, working experience, number of hours working per day. The questionnaire was clearly explained to the subjects. After marking, questionnaire was taken for evaluation. To search for the subjects who fit according to the criteria, various saloons were visited such as potheri, gudvanchery, urapakkam, vandalur, perungalathur, tambaram, chrompet, saidapet, Kattankulathur, maraimalainagar, chengalpattu mostly during the time of evening times. Around, 55-60 Saloons were visited for the data's and took subjects who had 3 or more years of experience in Saloon Industry. The time taken to explain the procedure was 10 minutes, approximately. After explaining clearly, the Written Informed Consent was obtained from each subject. 100 samples were collected in and around Chennai in the age group of 20 -35 years including only males as the subjects.

DATA ANALYSIS

Data was analyzed using IBM SPSS 3620 for Microsoft Windows 7. Frequency distribution with percentages was used to find the prevalence.

Table 1

Prevalence of pain over various region of the body among saloon worker during past 12 months.

	REGIONS OF PAIN	YES	NO
Have you at any time during last 12 months had trouble (ache, pain, discomfort, numbness) in	Neck	45	55
	Shoulders	72	28
	Elbows	14	86
	Wrist/hands	29	71
	Upper back	54	46
	Lower back	70	30
	Hips/thigh	13	87
	Knee	15	85
	Ankle	33	67

According to the total subjects taken, the percentage of pain is calculated. So, that the percentage can be more accurately seen in different regions. The percentage are shoulder (72%), lower back (70%) Upper back (54%) of the body. So the shoulder was found to more affected followed by lower back and upper back during the past 12 months among saloon workers.

Graph 1

Prevalence of pain over various region of the body among saloon worker for past 12 months.

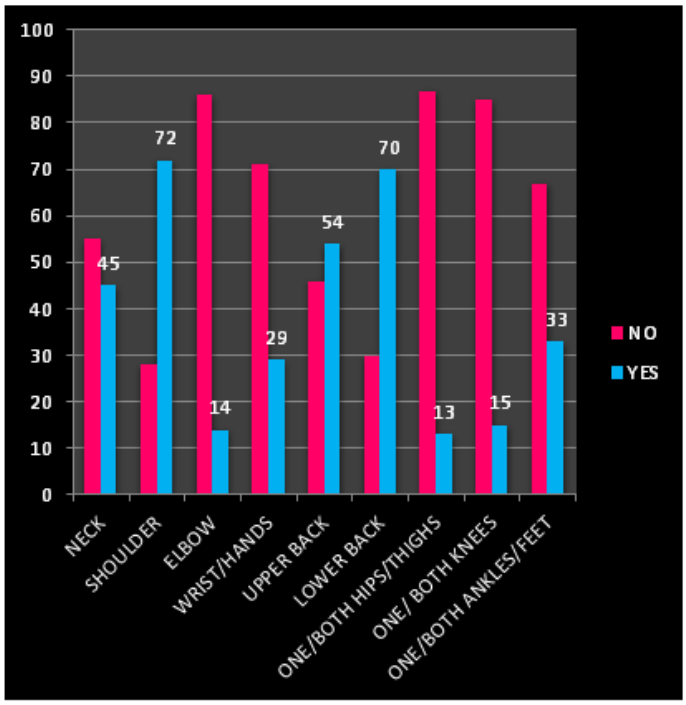


Table 2

Prevalence of disturbance that had prevented them from doing work during past 12 months among saloon workers.

	REGIONS	Percentage of Discomfort.
Have you at any times during last 12 months been prevented from doing your work(at home or away from home) because of the trouble	Neck Yes	50
	Shoulder	
	Yes, right shoulder Yes, left shoulder Yes both shoulder	32 6 44
	Elbow	
	Yes right shoulder Yes left elbow Yes both elbows	7 1 3
	Wrist/Hands	
	Yes right wrist Yes left wrist Yes both wrists/hands	22 6 18
	Upper back Yes	71
	Lower back Yes	75
	One or both hips/thigh Yes	7
	One or Both knees Yes	13
	One or both Ankles/feet Yes	43

In table 2, the subjects were asked to mark that they had a trouble/pain at any times during last 12 months for all the 9 regions .The percentage of lower back (75%), upper back (71%) region have highest percentage .So this table infers that low back pain mostly prevented them from doing work followed by upper back pain for past 12 months.

Graph 2

Prevalence of disturbance that had prevented them from doing work during past 12 months among saloon workers.

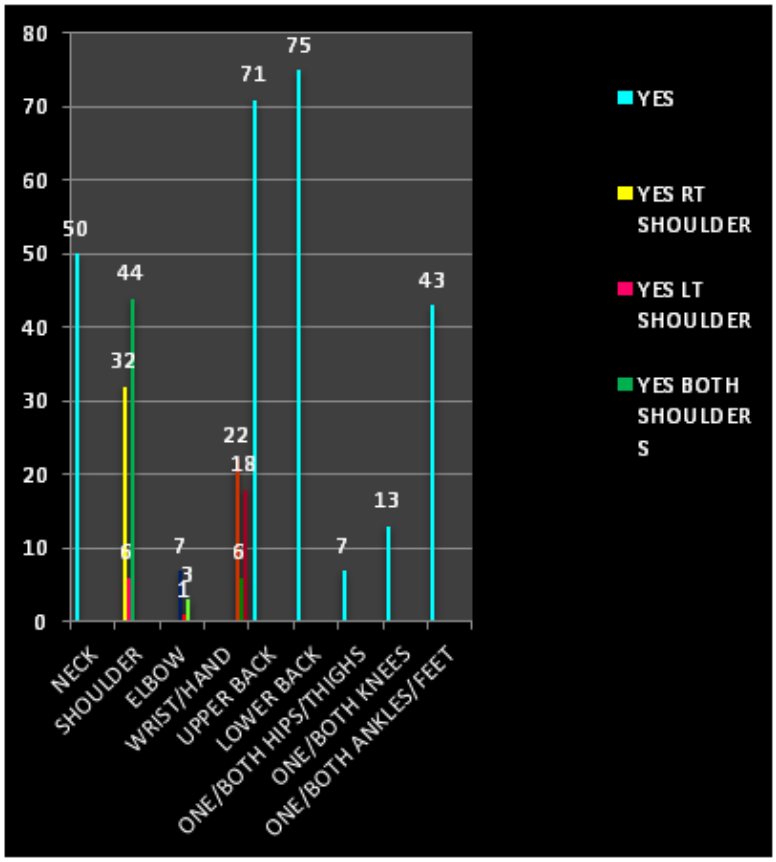


Table 3

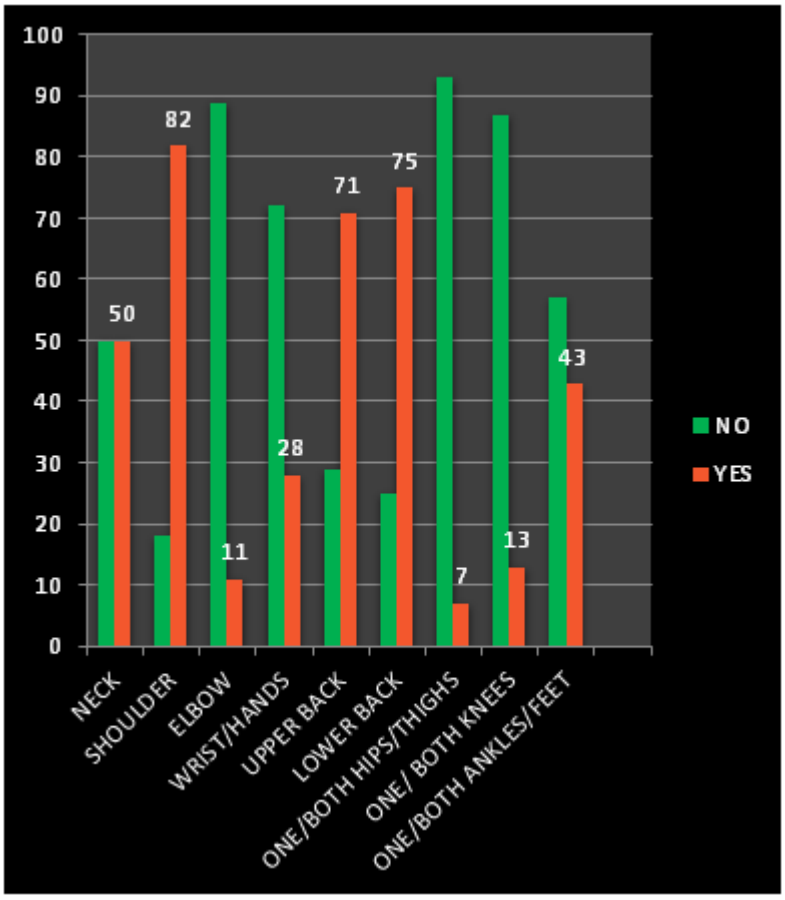
Prevalence of discomfort during last 7 days among saloon workers.

	REGIONS OF PAIN	YES	NO
Have you had trouble at any time during the last 7 days	Neck	50	50
	Shoulders	82	18
	Elbows	11	89
	Wrist/hands	28	72
	Upper back	71	29
	Lower back	75	25
	Hips/thigh	7	93
	Knee	13	87
	Ankle	43	57

The subjects were asked to mark that they had a trouble/pain at any times during last 7 days for all the 9 regions. The Shoulder (82%), Lower back (75%) upper back (71%) region have highest percentage.. So the shoulder was found to more affected followed by lower back and upper back.

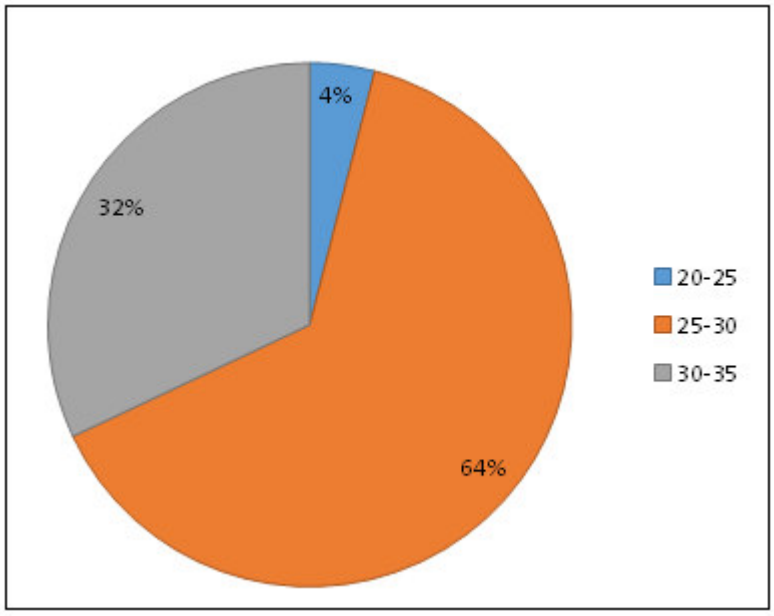
Graph 3

Prevalence of discomfort during last 7 days among saloon workers.



Graph 4

Prevalence of repetitive strain injuries according to the age



In the pie chart shown above the age group 25-30 years shows the highest percentage of Repetitive Strain Injury prevalence being 64% and the lowest being 20-25years with 4%.

RESULTS

According to the Table 1 and Graph 1

According to the total subjects taken, the percentage of pain is calculated. So, that the percentage can be more accurately seen in different regions. The percentage are shoulder (72%), lower back (70%) Upper back (54%) of the body. So the shoulder was found to more affected followed by lower back and upper back during the past 12 months among saloon workers.

According to the table 2 and Graph 2

In table 2, the subjects were asked to mark that they had a trouble/pain at any times during last 12 months for all the 9 regions. The percentage of lower back (75%), upper back (71%) region have highest percentage. So this table infers that low back pain mostly prevented them from doing work followed by upper back pain for past 12 months

According to the table 3 and Graph 3

The subjects were asked to mark that they had a trouble/pain at any times during last 7 days for all the 9 regions. The Shoulder (82%), Lower back (75%) upper back (71%) region have highest percentage. So the shoulder was found to more affected followed by lower back and upper back.

According to Graph 4

According to the pie chart shown the age group 25-30 years shows the highest percentage of Repetitive Strain Injury prevalence being 64% and the lowest being 20-25years with 4%.

DISCUSSION

The aim of the study was to find out the prevalence of repetitive strain injuries among saloon workers. Total 100 men saloon workers are recruited for the study according to inclusion and exclusion criteria. From the above data it has been proved that the pain is variantly seen in saloon workers and data have been collected from various regions of the body (neck, shoulder, elbow, upper back lower back, hip or thigh knee and ankle). The statistical analysis of IBM SPSS 3620 version shows that the pain is mainly seen in upper back, lower back regions and shoulder region with less variant in elbow and hip/thigh region. This in turn impacts on their productivity and ultimately reducing the quality of life of the practitioners. The data have been collected for various regions of the body and both sides in the Neck, Shoulder, Elbow, Upper back, lower back, Hip/Thigh and Knee joint, Ankle joint. In the table 1, subjects were asked to fill the Nordic questionnaire stating ache, pain, discomfort ,numbness) in following regions So, that the percentage can be more accurately seen in different regions .Prevalence of pain over different regions over the past 12 months were on shoulder (72%) lower back (70%), Upper back (54%), Neck (45%), Ankle (33%),Wrist/hands (29%) Knee (15%) elbows (14%) hip/thigh (13%). In the table 2**,** the subjects were asked to mark that they had a trouble/pain at any times during last 12 months been prevented from doing work (at home or away from home) because of the trouble. The percenage of prevalence over different region are (lower back (70%), Upper back (54%), Neck (45%), Ankle (33%),Wrist/hands (29%) Knee (15%) elbows (14%) hip/thigh (13%). In the table 3**,** the barbers were asked to mark that they had a trouble/pain at any times during last 7 days for all the 9 regions .the percentages of prevalence over different regions are Neck (50%) shoulder (82%), Elbow (11%) Wrist/hands (28%), Upper back (71%) lower back (75%), hips thigh (7%), Knee (13%). The above results are supported by Schaufeli et al. (2009) concluded that with high job demands and subsequent additional effort, the engaged worker is able to draw on resources available and sustain high levels of energy, work performance, resilience and well-being. The above results can be explained by Bakker et al. (2008) concluded that employees exposed to high musculoskeletal disorders are generally asked to take on additional responsibilities, are known to be hard workers and are dedicated to the achievement of work goals. Taris et al. (2006) concluded that employees who spend large amounts of energy at work are inclined to experience and demonstrate health problems in time. These health problems are said to develop as a result of high work demands. The risk factors associated with the occurrence of repetitive strain injuries were mostly related to biomechanical (uncomfortable posture at work) and psychosocial factors (lack of acknowledgement of work) and length of profession. Saloon workers are predisposed to pain or injury in different regions of the body depending on the type of work and the position adopted**.** These

problems lead to have a poor quality of life among them. Musculoskeletal problems are more prone in dominant side than non-dominant side in saloon workers. Initially symptoms such as spasm, swelling, inflammation are predominantly seen early in dominant side. Not only the upper limb and lower limb, the trunk also undergoes for biomechanical changes such as nerve root impingement, High repetitiveness and highly forceful movements were two important ergonomic factors associated with musculoskeletal disorders.

CONCULSION

This study concludes that prevalence of repetitive strain injuries in saloon workers is predominantly in shoulders, lower back and upper back due to variant changes in ergonomics and the awareness among them is comparatively less**.** Hence, insisting and providing ergonomic advice to saloon workers will be helpful from preventing musculoskeletal disorders in future.

Limitations and recommendations

Limitations

- Postural analysis was not done.
- Females are not taken in this study.
- Males with 20 to 35 years were included.

Recommendations

- Larger sample size.
- Postural change examination and correction is indeed.
- Age and gender wise statistical analysis can be done.
- Influence of work settings changes over work related musculoskeletal disorders can be done.
- Risk factors among saloon workers can be evaluated.
- Effects of Preventive measures can be analysed.

Region wise intervention with exercise protocol can be analysed.

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SP-06

THE STUDY OF PHYSICAL ACTIVITIES AND SOCIAL SUPPORT AMONG STUDENTS IN SRMIST CAMPUS

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ABSTRACT

AIM: The aim of the study is to observe the physical activities and social support and exercise among students in SRMIST campus. BACKGROUND OF THE STUDY: Physical activity that when performed regularly will affect the individual and his/ her surroundings positively in all aspects. Primary hypertension and other non-communicable diseases has high prevalence due to sedentary life style. Measures taken by most of the health policy makers include more physical activity to reduce the non-communicable diseases. According to WHO, among the top ten risks of global death rate, inadequate physical activity is in the main role. Individuals who perform atleast of two and a half hours of moderate physical activity per week will have less risk when others who does not engage in physical activity will have 20% to 30% risk of all-cause mortality. Cancers, diabetes and other heart diseases can be prevented by engaging in physical activity. METHODOLOGY: A non-experimental observational study was conducted with a convenient sampling of 200 samples in SRMIST Campus, kattankulathur. Exclusion criteria of musculoskeletal disorders, neurological pathologies and cardio-respiratory defects. Inclusion criteria of adolescents and early adults aged between 17-22, normal healthy individuals. Subjects will be observed based on the physical activity questionnaire and social support and exercise survey. RESULTS AND CONCLUSION:

KEYWORDS: ***physical activity; non-communicable diseases; PA questionnaire & social support and exercise survey.***

INTRODUCTION

Physical activity that when performed regularly will affect the individual and his/ her surroundings positively in all aspects. Cardiac diseases, cerebrovascular occlusions, diabetes millites, and other metabolic diseases can be prevented by regular physical activities. In public health, uncurable severe diseases are the evolving significant issue. Young individuals like college students are the ones who are increasingly adopted to sedentary behaviour and show decreased participation to the physical activity inspite of knowing its value. When students transform from school life to college life they show decline in the physical activity. There are many factors which are the causes for this decline. They experience different changes in their daily life. Students tend to experience the change of place, this location change may induce the decline in their psychosocial behaviour and influence for physical activity may be decreased due to the benefits. Class hours will also impact their physical activity. Hostelers and day scholars will have different levels of physical activity. Health in all aspects (like physical, mental, and social) will be improved by doing regular physical activity as per evidence. Mandatorily every individual should participate in physical activity. Many researches says that more than half of the college students participate in very less physical activity during their graduation. Healthy behaviour of each and every individual can be predicted by the social support they gain from the society. One individual guiding and helping out the other individual to meet his desired target and aid him/her to participate in smoking cessation program, weight loss program and any other programs is known as social support. Physical activity and social support is directly related. When social support is increased, influence of physical activity is also increased. There is a scale deviced to observe family support and friend support for exercise. The present study was done to observe the physical activities among campus

students and to observe the contributions of families and friends through social support for exercise questionnaire.

METHODOLOGY

The study was a non-experimental observational type of study. The participants in this study were undergraduate campus students at SRM Institute of Science and Technology. We obtained the informed consent regarding the study. After we gave the confidential believes to the students, students were participated voluntarily. Each and every questions in the questionnaire were answered genuinely and authors were there to explain the doubts they had during administration and completion of the questionnaire. Participants took less than 15 mins to complete the questionnaire. Data analysis was done using the SPSS software.

DATA ANALYSIS AND RESULTS

Individuals who were participated in the study were asked to recall their activities for the past one year. The issued questionnaire implies the relationship between physical activity and the social support. Each and every questions in the questionnaire helps to classify the physical activities into broad categories based on the participant's location, public transport, home based activity, leisure activities(TV or video viewing), stair climbing activities and class working hour. Information gathered out of the questionnaire reveals the retrieval of memory and frequency, intensity and duration of activities. Hence, there is a drastic decline in the physical activity among the college students.

Frequency Table

GET UP TIME ON WEEKDAY					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	7:00-10:00	20	10.0	10.0	10.0
	4:30-6:30	180	90.0	90.0	100.0
	Total	**200**	**100.0**	**100.0**	

GET UP TIME ON WEEKEND					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	7-10	161	80.5	80.5	80.5
	4:30-6:30	39	19.5	19.5	100.0
	Total	**200**	**100.0**	**100.0**	

BED TIME ON WEEKDAY					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	After 11	69	34.5	34.5	34.5
	Before 11	131	65.5	65.5	100.0
	Total	**200**	**100.0**	**100.0**	

BED TIME ON WEEKEND					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	After 11	100	50.0	50.0	50.0
	Before 11	100	50.0	50.0	100.0
	Total	**200**	**100.0**	**100.0**	

MODE OF TRANSPORT					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Car	34	17.0	17.0	17.0
	Public transprt	102	51.0	51.0	68.0

	Walk	47	23.5	23.5	91.5
	Cycle	17	8.5	8.5	100.0
	Total	**200**	**100.0**	**100.0**	

LEISURE ACTIVITY ON A WEEKDAY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	More than 4 hours	6	3.0	3.0	3.0
	33-4 hours	2	1.0	1.0	4.0
	2-3 hours	10	5.0	5.0	9.0
	1-2 hours	34	17.0	17.0	26.0
	Less than 1 hour	74	37.0	37.0	63.0
	None	74	37.0	37.0	100.0
	Total	**200**	**100.0**	**100.0**	

LEISURE ACTIVITY ON A WEEKEND

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	More than 4 hours	43	21.5	21.5	21.5
	33-4 hours	34	17.0	17.0	38.5
	2-3 hours	43	21.5	21.5	60.0
	1-2 hours	46	23.0	23.0	83.0
	Less than 1 hour	23	11.5	11.5	94.5
	None	11	5.5	5.5	100.0
	Total	**200**	**100.0**	**100.0**	

CLIMBING STAIRS ON A WEEKDAY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	31	15.5	15.5	15.5
	1-5 times	96	48.0	48.0	63.5
	6-10 times	50	25.0	25.0	88.5
	11-15 times	14	7.0	7.0	95.5
	16-20 times	4	2.0	2.0	97.5
	More than 20 times	5	2.5	2.5	100.0
	Total	**200**	**100.0**	**100.0**	

CLIMBING STAIRS ON A WEEKEND

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	31	15.5	15.5	15.5
	1-5 times	101	50.5	50.5	66.0
	6-10 times	42	21.0	21.0	87.0
	11-15 times	11	5.5	5.5	92.5
	16-20 times	8	4.0	4.0	96.5
	More than 20 times	7	3.5	3.5	100.0
	Total	**200**	**100.0**	**100.0**	

ACTIVITIES IN AND AROUND HOME

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	91	45.5	45.5	45.5
	Less than 1 hour	66	33.0	33.0	78.5
	1-3 hours	34	17.0	17.0	95.5
	3-6 hours	6	3.0	3.0	98.5
	6-12 hours	2	1.0	1.0	99.5
	More than 15 hours	1	.5	.5	100.0
	Total	**200**	**100.0**	**100.0**	

RESULTS

Overall physical activity is declined among the participants of SRMIST campus. Though declined physical activity is a known cause of non-communicable diseases, the two sets of social support for exercise shows no significant results. This indicates that awareness should be created among campus students regarding the regular physical activities and improvement in the social support and participation for regular exercises program.

DISCUSSIONS

This study of college students reveals relationship between physical activity and social support for exercises. participant's location, public transport, home based activity, leisure activities(TV or video viewing), stair climbing activities and class working hour has more impact on health status. There is a strong correlation between physical activity and the social support. Study on physical activity and social support on campus students implies that the need for the improvement of many awareness programs on physical activity among the college students to reduce the risk on non-communicable diseases. The participants in the study used very few physical activities and used more hours for TV and other leisure activities per day. These findings are positively associated with non-communicable diseases.

CONCLUSION

As a conclusion, physical activity is essential component and friends and families should be given awareness about the physical activity and regular physical exercise programmes can be approved for college students to reduced the decline in the physical activity.

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SP-07

PHYSICAL FITNESS EVALUATION AMONG FEMALE PHYSIOTHERAPY STUDENTS: A CROSS – SECTIONAL STUDY

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ABSTRACT

AIM: The aim of the study is to evaluate the physical fitness and to create awareness among female physiotherapy students. BACKGROUND OF THE STUDY: Physiotherapists in general need to be physically and mentally fit to deal the circumstances and obstacles they face during the therapy session. Health in the later life can be predicted by physical fitness levels. Individual who can perform a task competitively and without much loss of energy and at the particular time to solve a difficult situations is called as physically fit. This ability with less medical conditions is known as physical fitness. Evaluation and maintaining the physical fitness level is much more essential in the society in order to prevent non-communicable diseases. METHODOLOGY: A study was conducted with a convenient sampling of 123 samples in SRM College of Physiotherapy, SRMIST campus, kattankulathur. Inclusion criteria of female physiotherapy students aged between 17 – 22 years, normal healthy individuals. Subjects with neuromuscular pathologies, recent musculoskeletal injuries, cardio-respiratory diseases, congenital deformities will be excluded. Students were assessed based on INTERNATIONAL FITNESS SCALE (IFIS), Anthropometric measurements, Step up test (Aerobic test), Hand grip test (muscle strength), Sit and reach test (Flexibility) and Edgren 10s side step test (speed / agility). RESULTS AND CONCLUSION: The data analysis ends in the results that the subjects are around the normal level fitness and some falls under less fitness level.

KEY WORDS: ***Physical Fitness, International Fitness Scale (IFIS), BMI, Muscular strength, Cardio respiratory Fitness, Speed / agility, Flexibility.***

INTRODUCTION

Without fatigue of any muscles, when a task of a daily life is performed is called physical fitness. Balanced diet and strenuous exercise program is must to maintain the physical fitness. One must improve the physical activities by engaging themselves more in home based, work based, and society based activities. Set of physical exercises should be performed along with balanced diet, frequent rest in between the activity, body composition and genetic factors may influence the person's improvement in the physical fitness level. Men and women have many variation physiologically. In general men are more fit than the women as there are many hormonal changes in different periods of women's life, she loses her sustainability of maintaining the physical fitness. At the same time, men often take measures to show their excellence in building up their body compositions with muscles strength and endurance. As per evidence, the gender difference in showing their muscle strength is proven using isokinetic dynamometer, and also by evaluating the ability to perform the sit-ups and push-ups. In recent studies, there is marked decline in the physical performance among the college going adolescents and early adults. As they know the benefits, the emerging programs emphasis the people to be more physically active. Though there are many programs to create awareness, women have different patterns of physical activity in their life and still the gender difference persists in the muscles strength and endurance level. The physiotherapy profession needs physical fitness that includes muscle strength, endurance and more flexibility to deal with different patients and for the successful completion of the therapy tasks. Therapist who works in hospitals have varieties of tasks to perform with patients with different body compositions like transferring the patients from wheel chair to bed, ambulating the patients and changing the positions of endomorphic patients and gait training. Other than hospitals, physiotherapist

who work in clinic and sports team, should mandatorily have to follow certain physical attributes to maintain their fitness level and to have a healthy life style. According to the study of Punjab and Haryana physiotherapy students physical fitness among female physiotherapy students is less than that of male student. There are five components to measure the physical fitness. They are body composition, cardiovascular fitness, muscle strength, agility/speed and flexibility. The present study was done to evaluate the physical fitness level and to create awareness among the female physiotherapy students.

METHODOLOGY

A study was conducted with a convenient sampling of 123 samples in SRM College of Physiotherapy, SRMIST campus, kattankulathur. Inclusion criteria of female physiotherapy students aged between 17 – 22 years, normal healthy individuals. Subjects with neuromuscular pathologies, recent musculoskeletal injuries, cardio-respiratory diseases, congenital deformities will be excluded. Students were assessed based on International Fitness Scale (IFIS), Anthropometric measurements, Step up test (Aerobic test), Hand grip test (muscle strength), Sit and reach test (Flexibility) and Edgren 10s side step test (speed / agility).

Body composition
To check the built of a person.
BMI – Body Mass Index
Height measured using stadiometer in cm.
Weight measured using weighing scale.

Cardiorespiratory endurance
This refers to adequate supply of blood to heart and lungs to function normally. This test can be performed at rest and as well as during exercise (aerobic) and test gets completed by measuring blood pressure and heart rate. In general, low measurement indicates more efficient cardio respiratory functioning and better cardio respiratory fitness.

Aerobic test – step up (havard step test)

Purpose
The purpose of this test is to determine the aerobic fitness of the client.

Procedure
1. With a step or platform in front of the client, have them step up and backdown for 5 minutes (or exhaustion). The rate at which they step is 30 stepsper minute.
2. Make sure that the client steps up with the full foot planted on the platformand then brings the second foot up to meet it before they step down.
3. The client sits down immediately following the test and counts the number ofheart beats between 1-1.5 minutes, 2-2.5 minutes and 3-3.5 minutesrecovery.
4. The heart beats are added up and totalled.

Equipment
- A step or platform
- A stopwatch

Results
To work out the results of the test use this formula:
(100 x test duration in secs) divided by (2 x sum of heart beats in the recovery period)
Example: (100 x 300) / (2 x (90 + 80 + 70)) = 62.5

Muscle strength
Maximal force that can be generated by a specific muscle or muscle group.

Hand grip test

1. Have the subject stand for the test. Usually, this is performed with each hand. The norms provided use a combined score for the right and left hands. The test can also be performed with only the dominant hand.
2. Adjust the grip bar so that the second joint of the fingers will be bent to grip the handle of the dynamometer.
3. Have the subject hold the handgrip dynamometer parallel to the side of the body. The elbow should be flexed at 90 degrees. Make sure that the dynamometer is set to zero.
4. The subject should then squeeze the handgrip dynamometer as hard as possible without holding the breath (to avoid Valsalva maneuver). It is optional if the subject wishes to extend the elbow; however, other body movement should be avoided.
5. Record the grip strength in kilograms. Repeat this procedure using the opposite hand.
6. Repeat the test two more times with each hand. Take the highest of the three reading for each hand and add these two values (one from each hand) together as the measure of handgrip strength to compare with the norms.

Speed / agility

ability to move quickly and easily.

Edgren side step test

All about the Edgren side step test

1. Purpose / Use of test: To test a person's agility.
2. Goal: To see the amount of agility a person has
3. Component of fitness: This falls under the agility component of fitness
4. Predictive value: It is a positive statistic and diagnostic test, it is used to screen for agility

Equipment

- 5 pieces of tape or 5 cones
- Tape measure
- Stop watch or timer
- Clear, flat surface

Setup of the Edgren Side Step Test

You will need to get the tape or cones, use the tape measure to place the cones at 0,3,6,9,12 feet. There should be 3ft between each piece of tape or cone.
This test has to be performed on a flat surface.

Warm up

The only warmup needed to be taken through the full range of motion so the muscles are ready to perform the test.

Administration of the Edgren side step test

The subject performing the test will need to start at the corner of the 5 cones. The cone they start at they should be 6 feet from each other cone. They will go from left to right. (this doesn't really matter, just make sure you are consistent from subject to subject). They will need to assume the athletic stance (feet facing forward, knees bent, feet shoulder width apart), facing forward. Subjects are not to cross their foot at any point this will have points deducted from their final score. Once subject is ready you will start a stop watch subject will shuffle from left to right as fast as they can for 10 seconds. Once time is up you will tell the subject to stop. Before you begin the test make sure your subject completely understands the test. You will perform this test three times and take the best of the three scores.

Common mistakes made

Crossing foot over – not facing forward during the duration of the test
Not taking inside foot to the outside cones
Not being in the athletic stance

Remember every mistake made is minus one point before you multiply the scoring number by 5.
EQUATION: number of times passed cone minus mistakes times 5 equals agility.

Flexibility
Flexibility refers to the ability to move a joint throughout its natural range of motion.

Sit and reach test
Trunk flexion (sit and reach) test procedures
Pre-test: subjects should perform a short warm-up prior to this test and include some stretches (e.g., modified hurdler's stretch). It is also recommended that the participant retrain from fast, jerky movements which may increases the possibility of an injury. The participant's shoes should be removed.

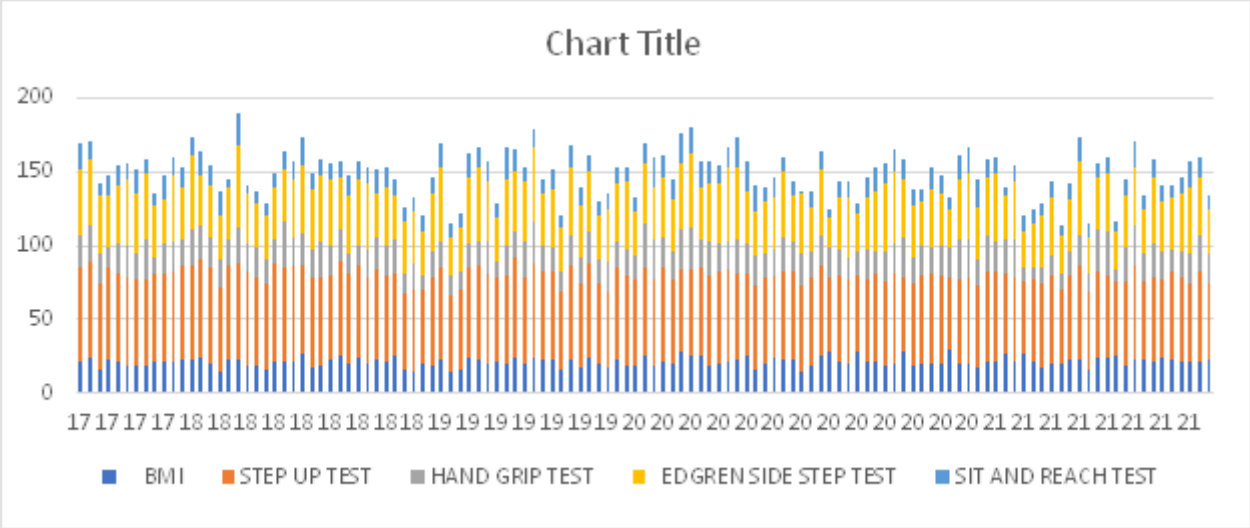
1. For the YMCA sit and reach test a yardstick is placed on the floor and tape is placed across it at a right angle to the 15inch in mark. The subject sits with the yardstick between the legs, with legs extended at right angles to the tapped line on the floor. Heels of the feet should touch the edge of the taped line.
2. The subjects should slowly reach forward with both hands as far as possible, holding this position approximately for 2s. be sure that the participant keeps the hands parallel and does not lead with one hand. Fingertips can be overlapped and should be in contact with the measuring portion.
3. The score is the most distant point inch reached with the fingertips, the best of two trials should be recorded. To assist with the best attempt, the subject should exhale and drop the head between the arms when reaching. Physiotherapist should ensure that the knees of the participant stay extended. The subject should breathe normally during the test and should not hold their breathe at any time.

DATA ANALYSIS AND RESULTS

A comprehensive physical fitness assessment includes at least one test to measure each of the five components of fitness: body composition, cardiorespiratory fitness, muscular strength, Agility / Speed and flexibility. Accurate assessment of the level of physical activity in large populations becomes important when investigating associations between health benefits and a physically active lifestyle. The data was analysed using IBM SPSS STATISTICS software. INTERNATIONAL FITNESS SCALE (IFIS) questionnaire was scored on a scale of 1 to 5 for each component. The score of each component was correlated with the measure of the same component in fitness testing. According to Body Mass Index (BMI), the subjects were divided into three categories as underweight(less than 18.5), normal(18.5 to 24.9), overweight(more than 25). On the basis of sit and reach test, the subjects were categorized into flexible and non flexible. The strength test were scored in kgs using the readings in the Baseline Hand grip dynamometer from weak to strong. The score of Harvard step test was categorized into five categories from poor to excellent (i.e.) 30 steps per minute is normal. The speed / agility was scored by Edgren side step test from poor to high. A total number of 123 subjects (females) participated in the study. The mean age of females was 17 to 22 years.

Descriptive Statistics

	Statistics				
Variables	N	Minimum	Maximum	Mean	Std. Deviation
AGE	123	17	22	19.35	1.280
BMI	123	14.400000000000000	28.700000000000000	21.058536585365854	3.120238715890556
STEP UP TEST	123	50	68	58.80	4.065
HAND GRIP TEST	123	9.000000000000000	31.700000000000000	19.643902439024384	4.742416661754060
EDGREN SIDE STEP TEST	123	20	55	37.80	6.929
SIT AND REACH TEST	123	2.0	22.0	12.362	3.6666
Valid N (listwise)	123				



DISCUSSION

At the end of the study, the female physiotherapy students understood the benefits and importance of physical attributes and physical fitness and also it's significant role in the profession of physiotherapy when compared to any other profession. Laziness towards the regular exercise is the main reason for the decline of physical fitness level in nearly half of the female physiotherapy students. The results obtained by correlating between individual's self assumed fitness level and evaluated fitness level. Among female physiotherapy students, body compositions was under weight to near normal when most of them are normal. This indicates some more programs should be developed in order to bring awareness on building the proper body composition. The cardio respiratory fitness is evaluated and as a result, most of the students had good level of fitness in cardio respiratory endurance and this indicated they can withstand very well during the therapy session. The muscle strength is evaluated by measuring the hand grip test using hand grip dynamometer, the results obtained was below average to average. This indicates that strengthening exercises should be given to improve the grip in order to hold the patient in correct positions even for quite a long time. Agility or speed plays another important role in the profession of physiotherapy. Quick transferring of the patients, immediate measures to rescue the patients and for all the other activities, a physiotherapist needs agility. The agility level among the female physiotherapy students is mostly near normal. Hence there is a little requirement for the improvement of speed. The flexibility is measured using sit and reach test and it is mainly concentrated on the hamstring tightness. Most of the female physiotherapy students had low level of flexibility and had hamstring tightness which restricted them. This indicates stretching exercises should be carried out to improve their flexibility level.

CONCLUSION

The self assumed level of physical fitness level is good among the female physiotherapy students but in the reality the evaluated value reveals the truth that they were poor in certain components of fitness measurement. Particularly, muscle strength and flexibility should be given more priority to bring the complete normal fitness level and measures should be taken to increase physical performances, to have a healthy life style and to provide a good treatment to their patients.

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SP-08

ASSOCIATION OF EXECUTIVE FUNCTION AND VISUAL SPATIAL PERCEPTION TRAINING AMONG BELOW AVERAGE SCHOOL STUDENTS.

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ABSTRACT

Brain deals with various geometric problems to transfer a stimulus into a purposeful movement. Hand eye coordination always remains complex as it requires an appropriate spatial temporal activation. Below average students have difficulty in attention, memory and hand eye coordination when compared to above average students. Hence this study explores the Association of executive function and visual spatial perception training among below average school students. Materials and Methods: A quasi experimental study was conducted for 50 below average school students from Government school, Hasthinapuram using convenient sampling technique with a follow up period of 8 weeks with intervention duration of 30 minutes (Executive function Exercises – 10 mins & Visual Spatial Perception Training - 15 mins with rest period of 5 mins) daily using their non-dominant hand and were assessed for pre and post test values with Ravens questionnaires and Revised Edinburgh questionnaires. Results: There was a significant difference with $p<0.001$ in Ravens Questionnaires and Revised Edinberg Questionnaires. Conclusion: The executive function based training and visual spatial perception training using their non-dominant hand among below average school students has improved their Intelligent Quotient and their academic performance.

KEYWORDS: ***Executive functions, hand-eye coordination, Intelligent Quotient, Ravens Questionnaires***

INTRODUCTION

Brain deals with various geometric problems to transfer a stimulus into a purposeful movement. A child intelligent quotient is determined by both genetic and environmental factors that start from the prenatal period. Handedness is the natural or biological preference for using one hand more than the other in performing special tasks depending on which hemisphere is dominant for the task. [1] The spatial and musical intelligence of left- hander individuals have better performance because of activation of non-dominant hemisphere and it would improve his/her retention and memory if well utilized. Executive Functions are generally thought to be involved in maintain an appropriate problem-solving set for attainment of a future goal. Hand eye coordination always remains complex as it requires an appropriate spatial temporal activation. People are referred to be ambidextrous, if they use both hands equally well and approximately on equal amount of the time. Jaffe, stated that relation of biological traits with handedness proves the relationship between handedness and biology.[2] Cardwell stated that lateralization is biologically programmed from the day a baby is born. The dominant and preference of one of the two hemisphere is directly connected with the body preference of handedness and it is immutable. [3] Left handers are more creative, more likely to notice the size, shape and form of things, and the whole picture or concept. All this show that they have more power of perception as compared to right handers [4] The school plays one of the major roles in child's life where the socialization beings and improvised. From the studies conducted on the brain activation during perceptual tasks it has been discovered that the non-dominant hemisphere is more activated than dominant hemisphere. According to McManus (1997), the increase in the proportion of left-handedness could produce a corresponding intellectual advance and a leap in the number of mathematical, sporting or artistic geniuses. The left-hand users are more introverted, intelligent and creative but the fact is we get more mixed handed as we get older. It has been proposed that perception has direct relationship with

the intelligence of a person and studies have indicated that perceptual power of left-handers is more specialized than that of right-handers because of the dominance of right hemisphere. [5] Brain lateralization refers to the left and right sides of the brain are not same. Left handedness is an intriguing phenomenon in its own right. Executive Function and Visual Spatial Perception plays an important role for the early recruitment in letter processing of brain regions known to successful reading and they facilitate reading acquisition and writing skills in young children. Hence this study was aimed to know the Association of Executive Function and Visual Spatial Perception training among below average school students when trained using non-dominant hand in improving their intelligent quotient level.

MATERIALS AND METHODS

Inclusion criteria: Students with age group 12 -14 years, Both Gender, IQ level - Below average (85 to 89), Students with Normal vision, hearing, motor development and able to understand. Exclusion Criteria: Un co-operative students, any Neurological deficits, recent upper limb fractures, Recent upper limb surgeries. An quasi experimental study was conducted for 50 below average school students from Government school, Hasthinapuram using convenient sampling technique with a follow up period of 8 weeks with intervention duration of 30 minutes (Executive function Exercises – 10 mins & Visual Spatial Perception Training - 15 mins with rest period of 5 mins) daily using their left hand and were assessed for pre and post test values with Ravens questionnaires and Revised Edinburgh questionnaires

Procedure

The willing subjects who fulfilled the inclusion criteria were included for the study and informed consent was obtained from their parents. Subjects demographic data, class test marks and IQ level assessment was noted, handedness questionnaire was used to find the most preferred hand by the subjects to perform a work either right or left was found before entering into the training intervention. 50 students were selected and group therapy was given under therapist supervision. The exercises were clearly instructed, demonstrated and explained to the subjects involved in the study in their own mother tongue language and was informed that they can withdraw from the study if they have any discomfort or difficulty during the study. Subjects were asked to do the exercise and practice it in the left hand. Executive Function Exercises (Playing with cards, Cross words, Puzzles & Memory games) for 10 mins and Visual Spatial Perception Training – using left hand (Writing – 5mins, Drawing and Colouring - 10mins) for 15 mins. Activities like taking a glass of water, arranging the books, brushing, locking and unlocking the lock/ door, usage of mobile/remotes are asked to practice at home Subjects were followed up for a period of 8 weeks with intervention duration of 30 minutes (Executive function Exercises – 10 mins & Visual Spatial Perception Training - 15 mins with rest period of 5 mins) daily using their left hand and were assessed for pre and post test values with Ravens questionnaires and Revised Edinburgh questionnaires.

DATA ANALYSIS

All statistical analysis were performed on IBM compactible micro computer using statistical package for the social sciences (SPSS 17.0). The significance was set at alpha=0.005 level paired-t test was used to compare the pre and post values of Ravens Questionnaires, and Revised Edinburgh questionnaires.

Table1

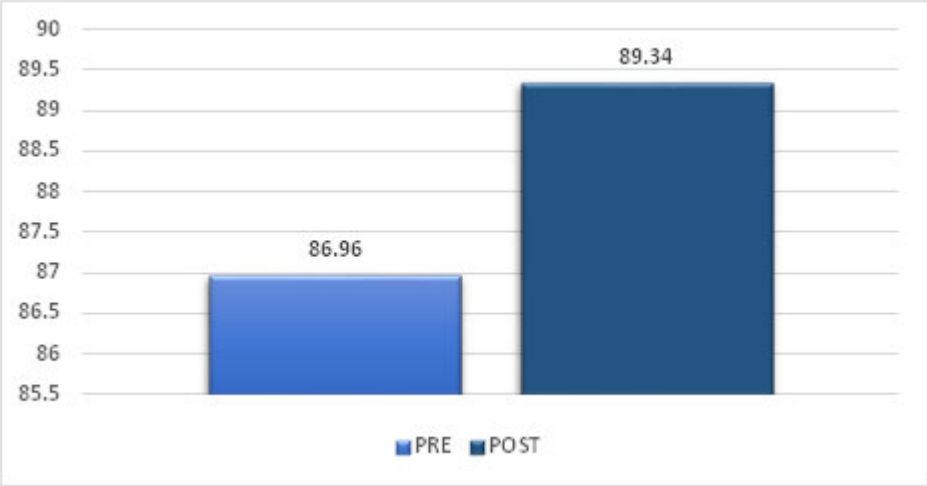
Association of Executive Function and Visual Spatial Perception training among below average school students using non-dominant hand in improving their intelligent quotient level using Ravens Questionnaires and Revised Edinburgh Questionnaires.

	Mean	Std.Dev	S.E	t-Value	Sig(2-tailed)
Ravens Progressive Matrix	2.38	0.61	0.11	21.59	0.001
Revised Edinburgh Questionnaire	-29.25	361.03	7.22	-10.89	0.001

RESULT

Graph 1

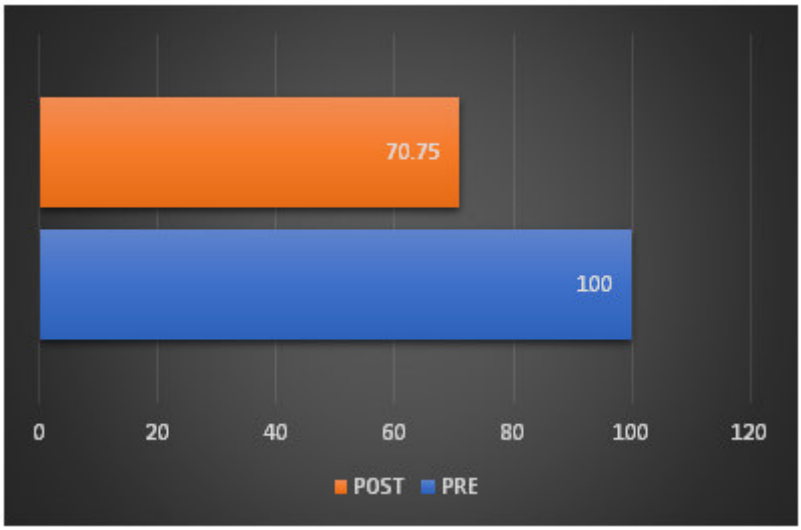
Comparison of Ravens Progressive Matrix before and after the Executive Function and Visual Spatial Perception training among below average school students using non-dominant hand



According to the numerical data obtained from the study there was a significant improvement in the intelligent quotient level after the training the non-dominant hand.

Graph 2

Comparison of Revised Edinburg Questionnaires before and after the Executive Function and Visual Spatial Perception training among below average school students using non-dominant hand



Graph 2:shows there was a significant improvement in using non-dominant hand by the below average school students.

DISCUSSION

Executive Function and Visual Spatial Perception plays an important role in planning, judging, executing, abstract thinking, attention and memory to facilitate reading acquisition and writing skills in young children. Despite their mirror-image appearance, the two hemispheres do not mirror one another's abilities. Instead, each hemisphere tends to specialise in different abilities and tend to possess different kind of information [6]. This is to say that some process or functions can happen in only one particular hemisphere. Different functions or actions within the brain tend to rely more heavily on one hemisphere or the other or tend to be performed differently in the two hemispheres. The right hemisphere seems to be somewhat more specialised than the left hemisphere for non-verbal, spatial, and more perceptual information processing and mental

rotation of shapes. Left handedness is also more common among musician, mathematician, professional baseball and cricket players, architects and artists [7]. There is higher creativity in persons who use left hand and right eye when compared with people who use right hand and right eye. The cerebral asymmetry of a left-handed individuals gives him/her good executive functioning capacity like retention, memory and co-ordination to achieve furtherance academically. Left-handers are also seen to be more creative, more likely to notice the size, shape and form of things, more likely to see the whole picture or concept [4]. All these show that they have more power of perception as compared to right-handers. James Adeniyi Adekoya and Abiodun Adekunle Ogunola did a study on Relationship between Left-Handedness and Increased Intelligence among University Undergraduates are better in these areas. Past research has shown that increase in the ratio of lefthanders can produce a corresponding intellectual advances and leap in the number of mathematical, sporting or artistic geniuses [8]. Many researchers in the past have tried to study the brain functioning of intelligent people. L. Thurstone (1938, 1955) found that he could carve intelligence into seven distinct factors called primary mental abilities – word fluency, verbal, comprehension, spatial ability, perceptual speed, numerical ability, inductive reasoning and memory. In the present study school going children's of age 12-16 were practiced with left hand writing for 2 months and after the completion 2 months they had significant increase in their IQ level , so the study proves that left hand writing has positive effects on the IQ level . From results gathered, it was obvious that while some other factors might contribute to the intelligence level of an individual, left handedness offers an additional advantage over right handedness.

CONCLUSION

The present study concludes that there is an association between executive function based training and Visual Spatial Perception Training using left hand among below average school students which has improved their Intelligent Quotient and their academic performance.

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SP-09

AWARENESS AND KNOWLEDGE ABOUT PHYSICAL THERAPY AMONG HEALTH CARE PROFESSIONALS

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ABSTRACT

BACKGROUND: The knowledge about the physical therapy education and profession seems to be demanding which other health care professionals should aware to meet the health care needs. OBJECTIVE: To find out current awareness and knowledge of physical therapy among health care professionals. METHODOLOGY: The survey was conducted online using social media in the form of questionnaire which had open ended and closed ended questions. PROCEDURE: 40 subjects answered the questionnaires which was uploaded as google survey form which the score of the questionnaires was recorded and calculated for obtaining the results after the data analysis. RESULT AND CONCLUSION: The results obtained after data analysis were statistically proved that there is an increased awareness about physical therapy which shows about 91.9% awareness about physical therapy among health care professionals.

KEYWORDS: ***Physical therapy, health care professionals, knowledge, awareness***

INTRODUCTION

According to World Confederation of Physical Therapy, "Physical therapy is concerned with identifying and maximizing quality of life and movement potential within the spheres of promotion, prevention, treatment/intervention, habilitation and rehabilitation. This encompasses physical, psychological, emotional, and social wellbeing. Physical therapy involves the interaction between the physical therapist, patients clients, other health professionals, families, caregivers and communities in a process where movement potential is assessed and goals are agreed upon, using knowledge and skills unique to physical therapists" Physiotherapy has emerged not only as an important medical and rehabilitative complement in health care delivery but also as a health profession with a vital therapeutic tool that employs defined scientifically-based protocols, and is an integral part of the treatment of most patients (American Physical Therapy Association, 1997). It is widely used in health institutions, private practices, schools, sports and work place settings (Hogue, 2005) involving interaction between the physical therapist, patients/clients, other health professionals, families, care givers and communities, using knowledge and skills unique to physical therapists.[1] The awareness about physical therapy profession among health care professionals is much lagging hence it essential to create awareness regarding this profession in order to meet the proper rehabilitative needs of an individuals in which physiotherapy plays a major role in improving the functional needs and restoring in to normal individual. Recent studies suggests that there is full awareness of physiotherapy among general practitioners. Musculoskeletal Physiotherapy showed good awareness among the study subjects. This was followed by Neuro Physiotherapy, Cardio respiratory and Sports Physiotherapy. However, community-based rehabilitation was least known. Also, physicians believe that prescribing exercises is the main intervention used by a therapist and there is less information regarding the recent advances in rehabilitation.[2] Due to its non-invasive and cost effective techniques, physiotherapy is rapidly gaining popularity among the people, but despite the recognition and advances, there are just a few researches done in India to evaluate its awareness among clinical doctors. Although physiotherapists practice independently of other healthcare services and also within interdisciplinary rehabilitation programs, the method of practicing physiotherapy as a first contact profession is infrequent since they often depend on referrals from practitioners from different fields[2] The growth and development of physiotherapy has been increased but still the right referral from the physicians and awareness about physical therapy rehabilitation is much needed to shorten the recovery period of an individual and to promote their health.

Aim and objective of the study

To find out current awareness and knowledge of physical therapy among health care professionals.

METHODOLOGY AND PROCEDURE

- It was an observational study. The survey was conducted online using social media in the form of questionnaire which had open ended and closed ended questions. The questionnaire was submitted using Google forms to all using a link shared via social media, (Whatsapp, Facebook, Gmail) for a period of one week. and validated for health care professionals.

The questionnaire form consists of 3 sets of 30 questions as per the following. Section one: Consists of Qualification, Age, gender, Month (s) of practice, Section two: Includes the questions based on awareness of physical therapy, Section three: Consists of questions based on conditions treated in physical therapy, the modalities used in physical therapy, and the source of information about physical therapy among medical interns. After administering the questionnaires from the participants the data was recorded and calculated accordingly and the results were obtained after the data analysis using SPSS version 20.

DATA ANALYSIS

Table 1

Questions	responses
1. About duration of physical therapy course	73.7 %
2. Aware of special techniques in physical therapy	8.3 %
3. Aware of treatment in physical therapy	86.5%
4. Aware about eligibility in entering physical therapy degree	89.5%
5. Aware about physical therapy specialization	50 %
6. Is physical therapy and occupational therapy the same	78.9 % (no)
7. Physical therapy is effective in reducing pain	86.5% (yes)
8. Physical therapy services are expensive	34.2% (yes)
9. Physical therapy role in community based rehabilitation	91.7%

RESULTS

Table shows that the questionnaire given, and each individual question carries respective percentange. Over all awareness showed about 91.9% about physiotherapy among health care professionals.

DISCUSSION

The intent of the study is to find the awareness about physical therapy profession among health care professionals. So the responses were obtained from the health care professionals from the data came to know that still knowledge about physiotherapy is still needed to provide rehabilitation. Regarding physical therapy specialization only 10% response shows about known about various fields in physiotherapy. Among this 15.8% knows about orthopaedic specialization,13.2% knows about sports physiotherapy, rest the field such as cardio respiratory, paediatrics, vetenary physiotherapy, obstetrics and gynaecology, manual therapy etc..thus physiotherapy plays major role in intensive care units in order to prevent muscle contracture, muscle wasting, early mobilisation. In the field of obstetrics and gynaecology conditions such as urinary incontinence, post delivery, dysmennorhoea etc.. and vast role in the field of neurology in rehabilitation such as hemiplegia, parkinsonism and neurological related problems. Additionally the modalities that are used in the physical therapy, among those 31.6% responses were for IFT, 10.5% for ultrasound, 7.9% for short wave diathermy. Rest of the modalities such as laser, muscle stimulator, Ultraviolet radiation got less than 10% responses. Traditionally, physical therapists have more often been seen as technicians subordinate physicians with no freedom to evaluate, diagnose or decide treatments for the patients[3]. However, things have changed recently. Our results show that awareness about PT is higher among healthcare professionals. This indicates the growth of physiotherapy as a profession in recent times. But, still awareness is needed to promote our growth.

Limitations

Sample size could be extended more than 100 to cover vast professionals. More relevant questions can be added.

Recommendations

Hence there is an increase awareness of physical therapy among health care professionals, hence studies can be done regarding with indepth necessity of knowledge on physical therapy.

CONCLUSION

This study concludes that there is an increase awareness of physiotherapy among health care professionals.

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SP-10

CORRELATION OF HAND GRIP STRENGTH AND HAND FUNCTIONS AMONG WOMEN SWEEPERS

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ABSTRACT

BACKGROUND: Prevalence of musculoskeletal discomfort on upper extremity is more among sweepers than lower extremity. The varying demand of the job and potential of the workers influence their physical and mental well-being highly. Impact of hand grip strength and hand functions was not well documented. This study aimed to find the correlation of the hand grip strength and hand functions among the women sweepers before and after sweeping. A non-experimental design pre and post test type was carried out on 40 samples of women sweepers. The population included the age group of 30-50 who never underwent any physiotherapeutic treatment with musculoskeletal discomfort. Exclusion criteria included diabetes, cervical radiculopathy, Peri arthritis of shoulder, recent fractures, surgeries, and burns in upper extremity. Hand grip strength was measured by Hand held dynamometer and Hand functions test was performed using Sollerman hand functional test. The study results with mean difference of hand grip strength 2.62 and mean difference of hand function is 0.04.Though hand grip strength was reduced after sweeping, they could perform the hand function test nearly to the same level as well as faster than before sweeping . Thus there is no correlation of hand grip strength and hand function among women sweepers.

KEYWORDS: ***Sweepers, hand grip strength, Sollerman hand function test, hand dynamometer***

INTRODUCTION

Sweepers are daily workers removing harmful pollutants and preventing illnesses or diseases. They have a continuous workload of sweeping and floor cleaning. Sweepers use brooms and a dustpan for cleaning wastes and squeegee for floor cleaning. A Study was conducted on occupational hazards on sweepers stated that these workers were exposed to number of environmental and occupational hazards leading to musculoskeletal disorders that accounts for 100%,while 95% with respiratory , dermatological problems (90%), headache (75%) and gastrointestinal problems (15%) during work.[5] Prevalence of musculoskeletal discomfort on upper extremity is more among sweepers than lower extremity. Pune research club has the data supports the fact that the 91.67% sweepers experienced pain on shoulder, 83.33% on arm, 76.67% on hand/wrist and 48.33% on upper back.[(6,7)] Hand grip strength is required to handle the tools. Handgrip is important function for performing movements. Reduction of hand grip strength leads to physical and psychological factors that affects the work. Physical factors include reduction in contracting muscle fibres, reduction in firing rate of motor unit. Psychological factors include pain, fear of pain, fear of injury.[(8,9)] Thus Hand grip play very important role in handling of brooms, squeegee and dustpan. Hand grip strength and function might be reduced due to repeated movements of upper extremity, but there was no evidence that hand grip reduction among sweepers. This study concentrates on the hand grip strength and hand functions of sweepers before and after sweeping. Thus the study focus to investigate the correlation of hand grip strength and hand function among women sweepers.

METHODOLOGY

Study design

A non - experimental study was conducted among the sweepers of convenient sampling of 40 samples. Pre and post test analysis were taken.

Subjects

Sweepers with musculoskeletal discomfort of upper extremity were taken for this study. Numerical pain rating scale (NPRS) was used and only those with a rating of 4-6 (moderate) were included in this study. All

the 40 participants were females and right hand dominant. The population included the age group of 30-50 who never underwent any physiotherapeutic treatment with musculoskeletal discomfort. Exclusion criteria included diabetes, cervical radiculopathy, periarthritis of shoulder, recent fractures, surgeries, and burns in upper extremity. None of the participants dropped out from the study.

Procedure

The subjects were selected based on inclusion and exclusion criteria. Informed consent was obtained after the detailed explanation of the procedure. The hand grip strength was measured using hand held dynamometer and three trials were obtained. The hand function was used to assess 7/8 handgrips by Sollerman hand function test

Sollerman hand functional test

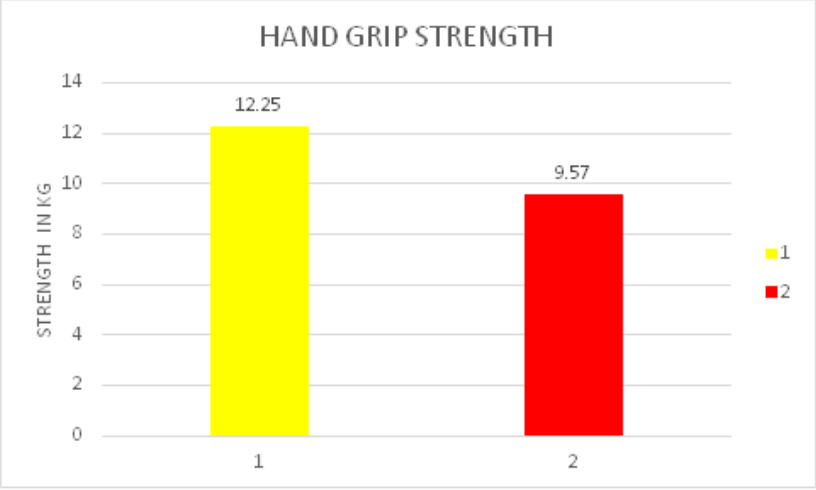
Sollerman hand function test was designed to assess 7 of 8 handgrips that are needed for certain ADL such as eating, driving, personal hygiene by using the certain functional tests. A test box is placed in front of the samples who are required to start each subtask in a seated position. The test consists of 20 activities of daily living. The tests were evaluated by the time taken to complete the 20 tasks. Each task were allotted 1 minute of time and scores were awarded based the speed of completion of test.

Hand held dynamometer

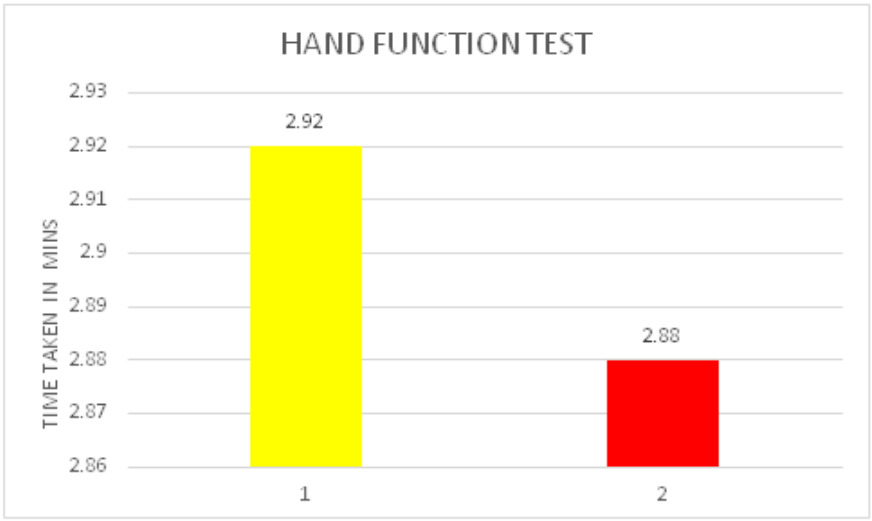
Hand dynamometer is a device used to measure the hand grip strength and muscle fatigue studies. The normal hand grip strength varies depending on age, gender and their muscle property. The instrument is scored using force production: kilograms (0-90).[1,2]

- The sweepers were positioned and the test was conducted in the right hand. They were instructed to hold the hand dynamometer for 5 seconds and the values were noted. Three trials were performed by the samples. This test was conducted before and after sweeping, to know their hand grip strength.
- The sollerman hand function tests were conducted before and after sweeping to evaluate the hand function of sweepers.
- The two tests were conducted after sweeping for 20 minutes as well to know if the grip strength and the time taken to complete the sollerman hand function test vary as of the prior test. The results are reflected based on the two tests.

RESULTS



Graph 1 ***shows pre test and post test values of hand grip strength taken before and after sweeping of nearly 20 minutes of work. There is a reduction in hand grip strength among all the sweepers with mean value of 2.62***



GRAPH 2 ***shows pre and post test values of sollerman hand function test taken before and after sweeping following the grip strength measurement. There is an increase in hand function scores of post test among all the sweepers with a mean of 0.04***

DISCUSSION

- The study focused on hand function and grip strength analysis among women sweepers. Sweepers are of different types include hospital sweepers, residential sweepers, street sweepers, etc.
- This study focused on hospital sweepers who work for eight hours of duty. The nature of this job is repeated sweeping and floor cleaning repeated with frequent rest period.
- The prevalence of musculoskeletal discomfort in these population was already documented in Mumbai at a Tertiary care hospital, 2015 to be nearly 80%,
- A study done on Italian rural cohorts stated that poor hand grip strength affects activity of daily living and a predictor for disability.
- A study conducted on hand grip strength on different athletic population concluded that hand grip strength enhances the performance of a number of gross motor movement pattern involved by hand. The study also states Increasing overall upper and lower body strength and increased muscle mass contribute for better hand grip functions [(3)]
- The post test was conducted for both hand grip and hand function in one of their rest period after the completion of sweeping. Every subjects were oriented about the procedure of hand function test and grip strength measurement.
- The nature and demand of this job could have a repetitive physical and mental stress which is responsible for this musculoskeletal discomfort. Therefore the findings of post test of hand grip strength analysis among sweepers shows uniform reduction which is a well known fact.[(8,10)]
- But interestingly the results of post hand function test showed a uniform increase in their values for every subject after the completion of task. Even though the decreased post test values of grip strength when compared to pre test values, the post hand function test showed a better achievement of completion of task than pre hand function test.
- The reason for the betterment might be either due to prior orientation of the task or habitual thought of compelling themselves to complete the task irrespective of stress to which they are accustomed. This could be the influence of neural adaptation among the sweepers profession.
- The physiology of performance behind the nature of work is similar to the marathon runners. They rely to large extent of high aerobic capacity and a slight degree of anaerobic threshold relates metabolic response to exercise that has highest performance. Since it is a low resistance and high repetitive movements they require more endurance to complete the task.[(3,13)]
- The compulsive nature of giving importance to the task completion than their physical and mental stress could be an underlying factor for high prevalence of Musculoskeletal discomfort.

Limitations of the study

- The study has few limitations that include the sample size and sampling method.
- Bias might have occurred due to subjectivity in response to musculoskeletal pain.
- Since the study was carried on hospital women sweepers there might be variation in other sweepers.
- Early treatment measures could have been taken.
- Habituation of women sweepers to stress pathology can be investigated for further study purpose.

CONCLUSION

- In women sweepers, hand grip strength and hand function were analyzed before and after sweeping. There is a gradual decrease in hand grip strength and a slight increase in hand function test was observed.
- Thus the study concludes there is no significant correlation between the hand grip strength and hand functions among sweepers.

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SP-11

PREVALENCE OF MORTON'S TOE AMONG COLLEGE STUDENTS

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ABSTRACT

Background: Morton's toe (Greek foot) is the condition of a shortened first metatarsal in relation to the second metatarsal. Foot problems may be a cause of length differences. The abnormal or over pronation of forefoot results in a lot of foot problems. Objective: To find out the prevalence of Morton's toe among college students. Methodology: An observational study was conducted among 100college students of SRM Institute of Science and Technology were measured using palpation based test. Length of ends of first and second toes was measured by drawing a line to the middle of second toe nail and another line to bisect posterior calcaneum. Graph paper placed on piece of plywood to standardize surface. The length differences between ends of both toes were measured using pencil and scale. A difference less than zero concluded second toe is longer and suggesting Greek foot. Result: Among 100 college students 16 students having the right side and 18 students having left side Morton's toe. Conclusion: This study concludes that 17% of college students (right foot- 16%and left foot-18%)having Morton's toe and more in left side when to compare to the right side. keywords: Morton's toe, metatarsal, pronation, palpation based test, calcaneum.

INTRODUCTION

Morton's toe(Greek foot) is the condition where the first metatarsal bone is shorter than second metatarsal bone. It is the type of brachymetatarsia. Brachymetatarsia is defined as an abnormal shortening of the metatarsal. The first and fourth metatarsal is affected most commonly[1]. Brachymetatarsia of the first metatarsal is otherwise called "Morton's syndrome or Toe". Morton's toe is caused either by idiopathic congenital conditions or acquired disorders. Idiopathic congenital conditions like hereditary early epiphyseal plate closure, associated congenital disorders such as Down's, Turner's, Larsen's, Albright's syndromes, pseudohypoparathyroidism, poliomyelitis. Acquired disorders like trauma, neurotrophic disorder, radiation exposure, surgical resection of the metatarsal head, infection, or osteochondrosis[2]. There are one or two problems that affect the first metatarsal bone in Morton's toe: 1. The first metatarsal bone that is shorter than the second metatarsal bone. 2. Hypermobility or instability of the First Metatarsal Bone. These problems can affect the normal walking process and also put more pressure on the second metatarsal bone during the toe-off phase of gait cycle[3]. Due to Morton's toe, the individual will have abnormal or overpronation. This pronation will ultimately cause or becomes a contributing factor that affects not only of the foot but also of the whole body[3].Problems affected in the foot and whole body: Foot pain(Metatarsalgia, Morton's Neuroma, Metatarsal stress fracture), Lower limb pain(Ankle pain, Knee pain, Runner's knee, Sciatica pain), Back and neck(Scoliosis, kyphosis, Low-back pain, Neck pain)[3]. The aim of the study is to find out the prevalence of Morton's toe among college students.

METHODOLOGY AND PROCEDURE

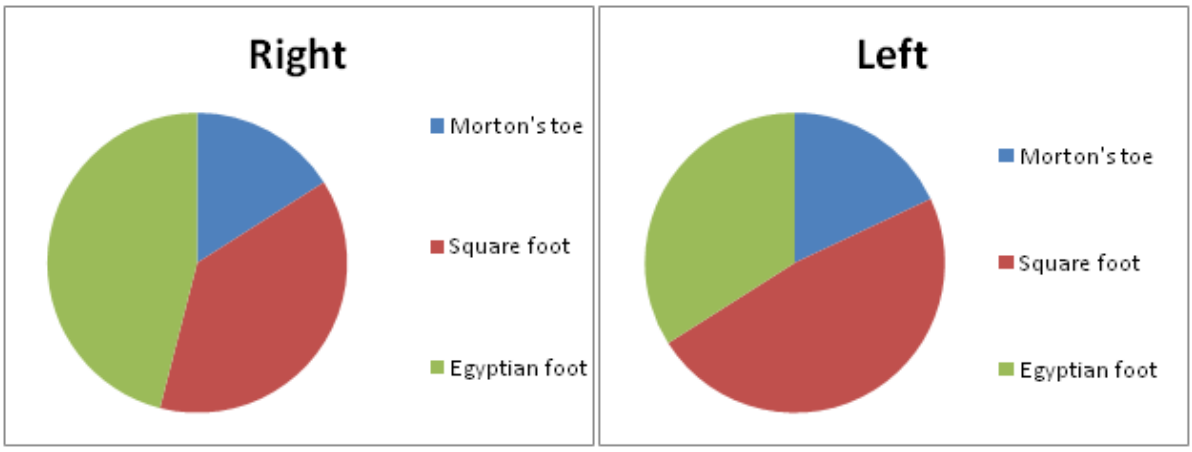
A non-experimental, observational study was conducted among 100 college students to find out the prevalence of Morton's toe between the age group of 18-25. The subjects who had a recent injury in the foot, unhealed fracture in lower limb, recent dislocation in the foot are excluded from this study. A total of 100 subjects (men-55, women-45) were taken based on the inclusion and exclusion criteria and informed consent was obtained after explaining clearly about the procedure. Length of ends of first and second toes was measured by drawing a line to the middle of second toe nail and another line to bisect posterior calcaneum. Graph paper placed on piece of plywood to standardize surface. (picture1& 2)[4]. To be the mark on second toe nail and calcaneum in straight line, the clawed or crooked feet are corrected by examiner. The length differences between ends of both toes were measured using pencil and scale (picture 1). If the differences was >0 means longer first toe (Egyptian foot), <0 means longer second toe (Greek foot), equal to zero means both toes are same in length (square foot). ±2 mm differences considered to correspond to square foot[5].

Picture 1
Marking the end of the toe

Picture 2
Standerdising foot position

RESULTS

Among 100 college students 16 students(men-10,women-6)having right side and 18 students(men-11,women-7)having left side Morton's toe. 38 students having right side Square foot and 48 students having left side Square foot. 46 students having right side Egyptian foot and 34 students left side Egyptian foot.



DISCUSSION

This study determined the prevalence of Morton's toe among college students is 17% and more in the left side. According to Schimizzi, A Brage, M[6] incidence of Morton's toe is 1 in 10000 among Japanese children and they conclude that more prevalence in female when compared to male and more in left side. But this study shows higher incidence of Morton's toe among college students. Female ballet dancers having Morton's toe are complaining more foot pain and more incidence of hallux rigidus. (Ogilvie-Harris DJ, Carr MM, Fleming PJ et al..)[7]. In index minus foot abnormal weight distribution and excessive pronation of foot may be noted. This may lead to activation of peroneus longus myofacial trigger points in marathon runners[4,8,9]. This study can be done in boxers because they are being in more toe off period in their practice and match time. And also in more sample size.

CONCLUSION

This study concludes that 17% of college students (right foot- 16% and left foot-18%) having Morton's toe.

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SP-12

EFFECTIVENESS OF HAND MUSCLE STRENGTHENING EXERCISES ON HAND GRIP STRENGTH IN CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER

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ABSTRACT

Attention Deficit Hyperactivity Disorder is a condition which shows group of symptoms such as inattentiveness, hyperactivity and impulsiveness and they also present with impairment of both fine motor and gross motor skills. The objective is to find out whether there was difference in hand grip strength between normal children and Attention Deficit Hyperactivity Disorder Children and to find out the effectiveness of hand muscle strengthening exercises on hand grip strength in children with Attention Deficit Hyperactivity Disorder. The study design was quasi experimental design, pre-test and post-test type. 30 children were selected based on the inclusion and exclusion criteria. They were divided into group A (normal children) and group B (Attention Deficit Hyperactivity Disorder children). Dominant hand grip strength was measured using hand dynamometer for them. Hand muscle strengthening exercises were given to group B. Post intervention measurement of the dominant hand grip strength were taken for group B. Statistical result shows that there was significant difference in mean values of dominant hand grip strength of group A and group B at $p<0.01$ and there was significant change in mean values between pre-test to post-test of dominant hand grip strength of group B at $p<0.01$.The study concluded that Attention Deficit Hyperactivity Disorder Children has lesser dominant hand grip strength when compared with normal children, and hand muscle strengthening exercise has significant effect on dominant hand grip strength in children with Attention Deficit Hyperactivity Disorder.

KEY WORDS: ***Attention Deficit Hyperactivity Disorder, hand grip strength, hand muscle strengthening exercises.***

INTRODUCTION

Attention Deficit Hyperactivity Disorder is a condition which shows group of symptoms such as inattentiveness, hyperactivity and impulsiveness.[1] Several studies shows impairment of both fine motor and gross motor skills in Attention Deficit Hyperactivity Disorder children[2] and its prevalence is 5.9% - 7.1% in children and adolescents. They present with overflow of movements, poor timing, poor force control, poor balance, problem in learning and doing the motor skills and having poor fine and gross motor skills.[3] Attention Deficit Hyperactivity Disorder children having difficulty in learning and poor attention span in classroom.[4] Other symptoms include low concentration, carelessness, excessive activity, difficulty in interacting with peers. They also present with low self-esteem and lack of social activity.[5] Imbalance in the neurotransmitter level is thought to be a cause of behavioral and emotional symptoms.[6] They are having comorbidities such as mood disorders, anxiety disorders, poor motor coordination. It is proved to be due to aberrant brain development interfering with neural networks.[7] Disorders of motor skills can be identified when the child not doing age specific skills.[8] Hand grip strength can be measured using a standard adjustable hand dynamometer according to the suggestion of the American Society of Hand Therapists.[9] Hand grip strength and pinch strength were often measured to assess any impairment in upper limb, any changes in strength and to assess the hand function.[10] Improper motor coordination also causes poor and slow handwriting.[11] Grip strength and pinch strengths are important in developing pencil control, hand writing legibility and motor skill independence.[12] Hand grip strength measurement is considered as significant way to measure the muscle strength because of its low cost and it is time efficient.[13] Hand strength can be measured by handgrip strength, lateral pinch, and three-point pinch strength.[14] Hand grip strength is directly

related to nutritional status of individual, therefore dietary deficiency also causes reduced grip strength.[15] According to some studies nutritional status of Attention Deficit Hyperactivity Disorder child is lower than normal child. Proper diet has to be given to Attention Deficit Hyperactivity Disorder children.[16] Grip strength indicates total muscle strength and can be used as a tool to measure general muscle strength.[17] Recent articles suggest that exercise has positive impact on brain structure and function and also improve the behavior of Attention Deficit Hyperactivity Disorder children.[18] The aim of the study were to find out whether there was difference in hand grip strength between normal children and Attention Deficit Hyperactivity Disorder Children and to find out the effectiveness of hand muscle strengthening exercises on hand grip strength in children with Attention Deficit Hyperactivity Disorder.

MATERIALS AND METHODS

Hand Held Dynamometer

Elastic band
Soft balls

Study design was quasi experimental, pretest and posttest type. 30 subjects (15 normal children and 15 children with Attention Deficit Hyperactivity Disorder) with the age of 10-15 years, those who are able to follow the commands, both genders were selected from Maithree Special School, Tambaram, Government Higher Secodary School, Guduvanchery, SRM Hospital and Research Centre, Kattankulathur. Children with fracture or dislocation of upper limb, any soft tissue injuries in upper limb, tumor or infection of upper limb were excluded from the study. Subjects were divided into group A (15 normal children) and group B (15 Attention Deficit Hyperactivity Disorder Children). Procedures were explained clearly to the parent or guardian of the participant and informed consent was obtained. Dominant hand grip strength was measured using hand dynamometer for normal children and Attention Deficit Hyperactivity Disorder children (Group A and Group B). During measurement child was in sitting position with shoulder adducted and neutrally rotated, elbow at 90 degree flexion, forearm and wrist at the neutral position.[9] Dynamometer will be set at the second handle position. Children will be instructed to squeeze the handle of the dynamometer as hard as they can for 5 seconds, 3 trials will be conducted with 1 minute rest between trials & mean values of these 3 trials will be used.[9] Dominant hand grip strength of the normal children (Group A) and children with Attention Deficit hyperactivity Disorder (Group B) were compared. As dominant hand grip strength of group A was more than the dominant hand grip strength of group B, so hand muscle strengthening exercises were given to group B. Exercises were ball squeezing, elastic band exercises, closed fingers, closed fist, fingers apart, opposition of thumb with 2^{nd} ,3^{rd} , 4^{th} ,5^{th} digits, straighten fingers, knuckle bend and karate chop.[11] Each exercise 20 repetitions per day, weekly 5 continues days for 6 weeks. Post intervention measurement of the dominant hand grip strengths were taken for children with Attention Deficit Hyperactivity Disorder Children (Group B). Outcome measure is Hand Held dynamometer. Dynamometer will be set at the second handle position. Children will be instructed to squeeze the handle of the Dynamometer as hard as they can for 5 seconds, 3 trials will be conducted with 1 minute rest between trials & mean values of these 3 trials will be used.[9]

RESULTS AND DISCUSSION

According to Table 1 mean values of dominant hand grip strength of normal children and Attention Deficit Hyperactivity Disorder children are 18.7 and 7.38 respectively. As $p<0.01$, statistical result shows that there significant difference in mean values of dominant hand grip strength of normal children and Attention Deficit Hyperactivity Disorder children. According to Table 2 mean values of pre-test and post-test of dominant hand grip strength of Attention Deficit Hyperactivity Disorder children are 7.38 and 9.41 respectively. As $p<0.01$, statistical result shows that there significant change in mean values between pre-test to post-test of dominant hand grip strength of Attention Deficit Hyperactivity Disorder children. The objectives of the study was to find out whether there was difference in hand grip strength between normal children and Attention Deficit Hyperactivity Disorder Children and to find out the effectiveness of hand muscle strengthening exercises on hand grip strength in children with Attention Deficit Hyperactivity Disorder. Statistical analysis of this study showed that there is significant difference between mean values of dominant hand grip strength of normal children and Attention Deficit Hyperactivity Disorder children which is 18.7 and 7.38 respectively. As $p<0.01$, study showed that there is significant difference in dominant hand

grip strength of normal children and Attention Deficit Hyperactivity Disorder children. The study results go in hand with results of Javeier Fenollar Cortes et al., who concluded that there are poorer fine motor executions in Attention Deficit Hyperactivity Disorder group than the control group in all fine motor coordination tasks. For more complete Attention Deficit Hyperactivity Disorder treatment, researchers recommending training and enhancement of the fine motor skills.[19] Thelma M Pitcher et al., stated that significant motor impairment was found in all three DSM-IV Attention Deficit Hyperactivity Disorder subtypes as a recent fact.[20] Marie-EÁ ve Marchand-Krynsk et al., states that Attention Deficit Hyperactive Disorder has insufficiency in motor skills which may be due to usual slowness of motor behavior in responding or trouble in learning phase.[21] Vengata Subramani Manoharan et al., declared that nutrition deprival and repletion influence the hand grip strength in their study.[22] Esma Energin et al., concluded that there are significantly lower intake of Energy, protein, fat, saturated fatty acids, monounsaturated fatty acids, carbohydrate, niacin and zinc in girls with Attention Deficit Hyperactivity Disorder. And there is lower intake of all nutrients in male Attention Deficit Hyperactivity Disorder children when compared to control group.[23] Lower nutritional quality may be one of the reasons for reduced hand grip strength in Attention Deficit Hyperactivity Disorder children. Francisco Rosa Neto et al., concluded that when compared to normally developing children Attention Deficit Hyperactivity Disorder children are correlated with a lag in motor evolution.[24] One of the reasons for reduced hand grip strength in Attention Deficit Hyperactivity Disorder Children is that they find difficulty in understanding and learning the way to press the hand held dynamometer and how forcefully it has to be pressed. Attention Deficit Hyperactivity Disorder children who were given hand muscle strengthening exercises have shown significant change in mean value from 7.38 to 9.41 between pre-test and post-test of dominant hand grip strength. As $p<0.01$, the study showed that there significant improvement in dominant hand grip strength of Attention Deficit Hyperactivity Disorder children from pre-test to post-test. The study results was supported by the results of Halla B Olafsdottir et al., who told that the accomplished measure to augment the finger strength and hand function and force-producing capacity of muscles is improving strength .[25] Sun-Kyoung Lee et al., stated that when combined exercise program included in intervention it had positive effect on overall health level, and neurotransmission in children with Attention Deficit Hyperactivity Disorder and suggest that combined exercise program should be utilized as a virtuous intervention for improving the manifestation of Attention Deficit Hyperactivity Disorder in children.[26] Strengthening exercises, produces muscle contraction, thereby increase muscle strength, endurance, and size of the muscle and also there increase in the energy level and reduced fatigue level.[11] The study showed that hand muscle strengthening exercise has significant effect on hand grip strength in Attention Deficit Hyperactivity Disorder Children.

Table 1

Comparison of mean values of dominant hand grip strength for normal children (group A) and adhd children (group B)

Dominant hand grip strength	Mean	N	Std. Deviation	Std. Error Mean	t -value	Sig. (2-tailed) P value
Normal children (Group A)	18.7	15	4.67376	1.20676	9.704	.000
ADHD children (Group B)	7.38	15	3.78974	.97851		

Graph 1

Comparison of mean values of dominant hand grip strength for normal children (group A) and adhd children (group B)

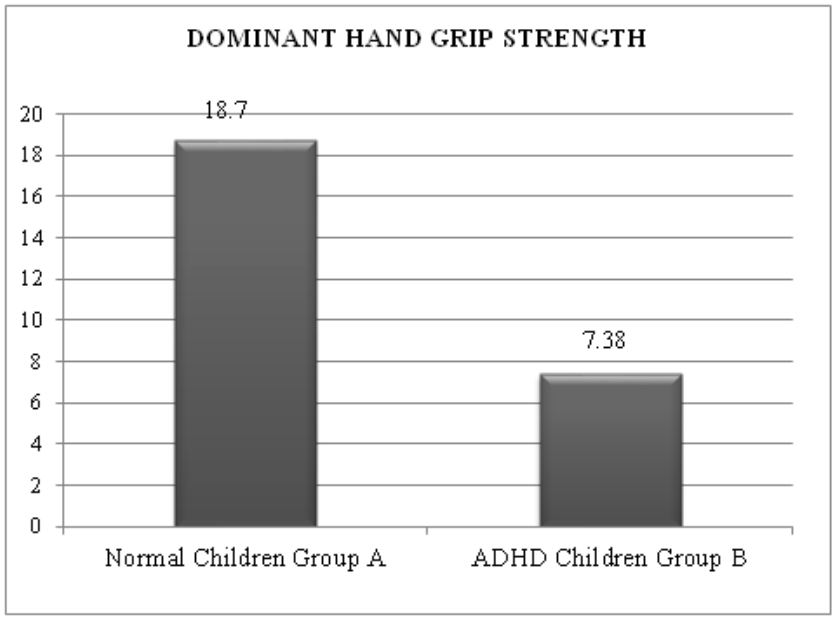


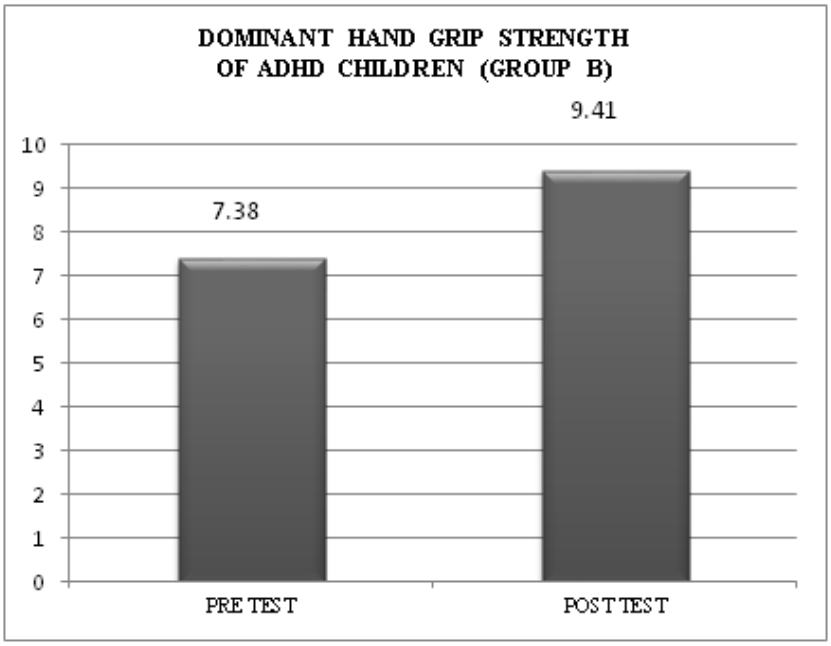
Table 2

Comparison of mean values of pre and post test of dominant hand grip strength of adhd children (group B)

Dominant hand grip strength	Mean	N	Std. Deviation	Std. Error Mean	t –value	Sig.(2-tailed) P value
Pre test	7.38	15	3.78974	.97851	-5.079	.000
Post test	9.41	15	3.81425	.98484		

Graph 2

Comparison of mean values of pre and post test of dominant hand grip strength of adhd children (group B)



CONCLUSION

The study concluded that Attention Deficit Hyperactivity Disorder Children has lesser dominant hand grip strength when compared with normal children, and hand muscle strengthening exercise has significant effect on dominant hand grip strength in children with Attention Deficit Hyperactivity Disorder. Limitations of the study were smaller sample size and lesser study duration. Recommendation for the further. research are interventions can be given to whole upper limb instead of concentrating only on hand muscles, some other outcome measures can be used other than hand held dynamometer, EMG measurements can be taken for hand muscles, some other motor activities can be assessed in future studies.

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SP-13

EFFECTIVENESS OF PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION AND SUSTAINED STRETCHING EXERCISES TOWARDS HIP ADDUCTOR TIGHTNESS IN FIELD HOCKEY PLAYERS

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ABSTRACT

BACKGROUND: Groin region is known as inguinal region, which consists of adductors, illiopsoas and abdominals, where adductor group of muscles commonly get injured among sports person. Muscle tightness occur due to the eccentric overload of muscle and these criteria comes under groin injury by three grades i.e grade 1 and 2.These study includes field hockey players with adductor tightness in grade 1 and 2,Intervention measures Proprioceptive neuromuscular facilitation (Hold relax) and sustained stretching. OBJECTIVE: To find out the effectiveness of proprioceptive neuromuscular facilitation and sustained stretching in field hockey players. STUDY DESIGN: Experimental design, pre and post type, PROCEDURE: A total number of 30 field hockey players were selected, according to the inclusion and exclusion criteria. Among them Group A is considered as Control group and Group B is considered as an Experimental group. For Experimental group, intervention is given for 4 weeks 2 days per week. Outcome measure take as Range of Motion and HAGOS questionnaire. RESULTS: The result for this study shows that the Range Of Motion and HAGOS questionnaire shows significant result by $p<0.005$ and for the control group it is non-significant Range of Motion($p=0.461$),Subscales of HAGOS where Symptoms($p=0.263$), Pain($p=0.150$), ADL($p=0.110$), SPORT/REC ($p=0.150$),PA($p=1.00$), QOL($p=0.019$).For experimental group it is significant for all the outcome measures. CONCLUSION: The study concludes that there is a significant improvement in Range Of Motion, Activity of daily life, Sports and recreational activities, Physical activities, Quality of life to the field hockey players with hip adductor tightness.

KEYWORDS: ***Groin injury, Proprioceptive Neuromuscular Facilitation, stretching, hockey players.***

INTRODUCTION

Groin region is known as inguinal region of the body, which presents in the anterior abdominal wall, inferior part of thigh, pubic tubercle at medial aspects and anterior superior iliac spine at superolateral aspect[1] .Injury to the groin region occurs due to damage in either of these structures such as muscle, bone or tendons. Musculo-tendinous structures involvement is common, mainly in adductors, illiopsoas, and the abdominals. Injury can occur in tendon or in the enthesis of tendon; close to the musculo-tendinous junction or the aponeurotic plate in the symphysis joint.[2,7,8] Adductors of the hip joint has 6 muscles: adductor longus, adductor Magnus, adductor brevis, graciles, obturator externus and pectineus. All the muscles in the medial compartment of the thigh are supplied by the obturator nerve (L2-L4). In open kinetic chain, Adduction of the thigh is the primary function of the adductor group of muscle. In closed kinetic chain, stabilization of the lower extremity and the pelvis.[3,9,10] Hockey is the unite group team game between two team, each team consists of eleven players using hooked sticks , A player dive a small hard ball towards goals on opposite end of field.[4,11,12] These hockey is further divides in two category namely ice hockey and field hockey. Field hockey is game played out through the natural grass and also in the synthetic artificial turf. But the injury is more common in the natural grass than the artificial synthetic turf.[4,11] Most studies concerned at extrinsic injuries of field hockey ,In many aspect intrinsic injuries and overuse injuries are commonly occurred. Such as muscle strain, ligament sprain, where accounted for 11-18% of all hockey injuries.[4,13] Most common

injuries occurrence at head, shoulder, back pain, groin region, ankle region. And the site of injuries are occur at anterior cruciate ligament, meniscal ligaments, hamstring muscles, tibial shin splints. Lower limb represents 12.7% of all hockey injuries.[4,12] Incidence of the groin injuries in hockey player is 20 per 100 players in one year.[4,10] Adductor muscles are often to get injured in the hockey players. Patient get pain in medial thigh while gives the resistance in adduction of the hip.[4,10] Strain or rupture of the illiopsoas muscle can also get injured due to eccentric overload. Gradual stretching and strengthening of the adjacent muscles should perform. Treatment has provided through exercises in the form of aquatic deep water pool running, stationary bicycling with no resistance, active range of motion exercises of hip and isometric exercises, straight leg raises (SLR), quadriceps set.[4,13] In advances phases concentric and eccentric hip abduction and adduction with thera-band, functional drills after warm up.[4,14] Muscle tightness is occurred due to the load with high impact of force at one regional anatomical structure.[19] The activity of the muscle is based upon the tone , the increased tone of muscle physical property leads to the spasm in the muscle activity, It also a protective mechanism from the further damage or load to the muscle.[20] Adductor tightness are graded by first degree strain there is pain but minimal loss of strength and restricts in range of motion. A second degree showed out strain of the muscle tissue damage and compromises of function also not the complete loss of function. A third degree strain denotes complete disruption of muscle tendon unit and loss of muscle function.[3,18] Stretching is the part of warm up to improves the flexibility or pain free range of motion to promote a better performance. There are many types of stretching exercises for the muscle flexibility. Proprioceptive neuromuscular facilitation is the most advanced stretching technique for the muscle group targeted. Initially it is the rehabilitation technique further it develops as the treatment protocol in many field. This technique has two types of the stretching techniques finely called as HOLD RELAX and CONTRACT RELAX technique. Hold relax technique can be applied in the adductor tightness release intervention.[21] Sustained stretching is the stretch method to stretch the muscle and hold in static position for minimum 30 seconds upon the player tolerance.[22] By the warm up of the practice session or match, Every players undergone in stretching protocol. But the stretch duration vary for every muscle and every player tolerance.[23] Field hockey players are prone to get the groin injury due to their posture while playing. There are various treatments is undergone for the groin injury commonly cryotherapy, massage are also encouraged and in severe cases surgery is needed. Many studies done on the athletes and football about groin injury and stretching protocol to manage and prevent the injury. Hence this study is done to find effectiveness of proprioceptive neuromuscular facilitation stretching technique in field hockey players.

Materials used in the study

Universal goniometer

Hip and Groin Outcome Score (HAGOS) questionnaire.

Procedure

A total number of 30 field hockey players were selected, According to the inclusion and exclusion criteria. Among them Group A was considered as an Control group(15 players) and Group B was considered as an Experimental group(15 players). Prior to the study participants should fill the concern form to participate in the study. Both the controlled group and experimental group were given HAGOS questionnaire and measurement was taken for active hip abduction range of motion prior to the study. The control group follows the regular physical activity for the period of one month and the experimental group were given proprioceptive neuromuscular facilitation and sustained stretching for 2 days per week for 4 weeks. Hold relax technique was given for 4-5 minutes, per player(for one limb)and sustained stretching ,which was given for minimum 30 seconds to hold the players in sustained stretch position accordance to the player's injury and tolerance. After the intervention both the groups were given HAGOS questionnaire and active hip abduction range of motion assessment. Active hip abduction range of motion was assessed for the player in supine position; the therapist has to be adjacent to the player. The axis of the goniometer was placed in anterior superior iliac spine; Stable arm was perpendicular to the limb the imaginary line from anterior superior iliac spine and the movable arm anterior midline of the femur. The player was asked to do the active hip abduction and the measurement for the range of motion of the hip abduction was taken. Normal Hip abduction range motion is 30^0 to 50^0.

Outcome measures

Active hip abduction range of motion.

HAGOS Questionnaire subscales scores

Subscales: Symptoms, Pain, Activity of daily life, Sport and recreational activities, Physical activity, Quality of daily life.

RESULTS

The statistical package for social science (SPSS) version 25 for Windows was used for data analysis. The statistical tool used in this study was the paired 't' test, Independent 't' test. Paired't' test was used for analysis of pre-test and post-test means within the groups, whereas independent t-test was used for analysis of the comparison between the 2 groups.

Graph 1

Graph 1 Shows the variation in mean of pre and post-test of group-A

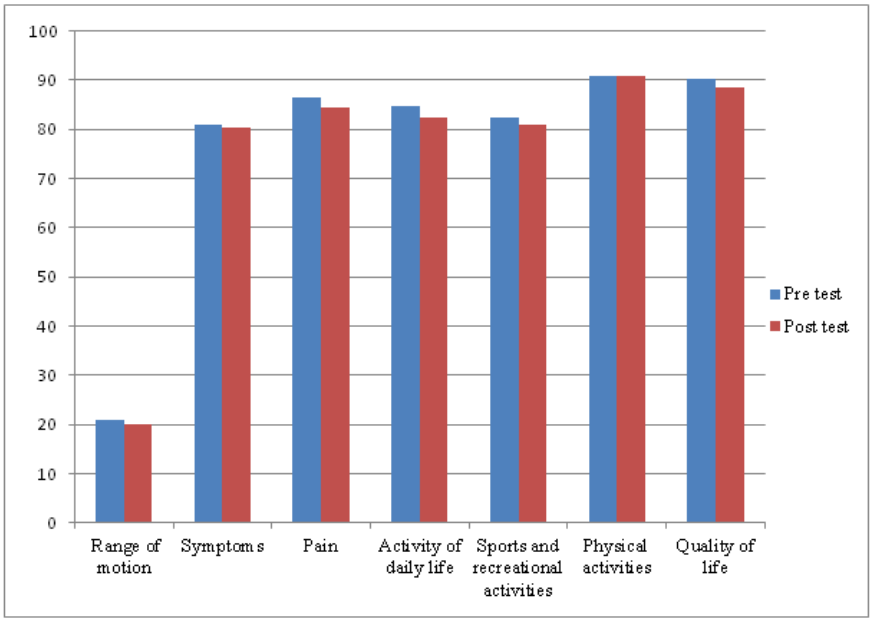

Table 1

Table 1 Shows the mean, standard deviation, paired"t" value and "p" value of group- A

S.No	Group-A (control)	Mean		Standard deviation		Paired "t" value	"p" value
		Pretest	Posttest	Pretest	Posttest		
1.	ROM	21.066	20.133	4.574	3.925	0.757	0.461
2.	Symptoms	81.052	80.406	8.075	7.824	1.167	0.263
3.	Pain	86.500	84.351	4.204	5.133	2.774	0.150
4.	ADL	84.666	82.333	6.399	8.423	1.705	0.110
5.	Sport/REC	82.498	81.039	7.355	9.334	1.523	0.150
6.	PA	90.833	90.833	7.420	8.796	0.000	1.000
7.	QOL	90.333	88.666	3.518	3.518	2.646	0.019

According to Table 1,outcome ($p<0.005$) is significant for the study., ROM (Range Of Motion) is not significant ($p=0.461$)., SYMPTOMS subscale is not significant ($p=0.263$)., PAIN subscale is not significant ($p=0.150$)., ACTIVITY OF DAILY LIFE (ADL) subscale is not significant ($p=0.110$)., SPORTS AND RECREATIONAL ACTIVITIES (SPORT/REC) subscale is not significant ($p=0.150$)., PHYSICAL ACTIVITY (PA) subscale is not significant ($p=1.000$)., QUALITY OF LIFE (QOL) subscale is not significant($p=0.019$).

Graph 2

Graph 2 Shows the variation of mean in pre and post-test of group-B

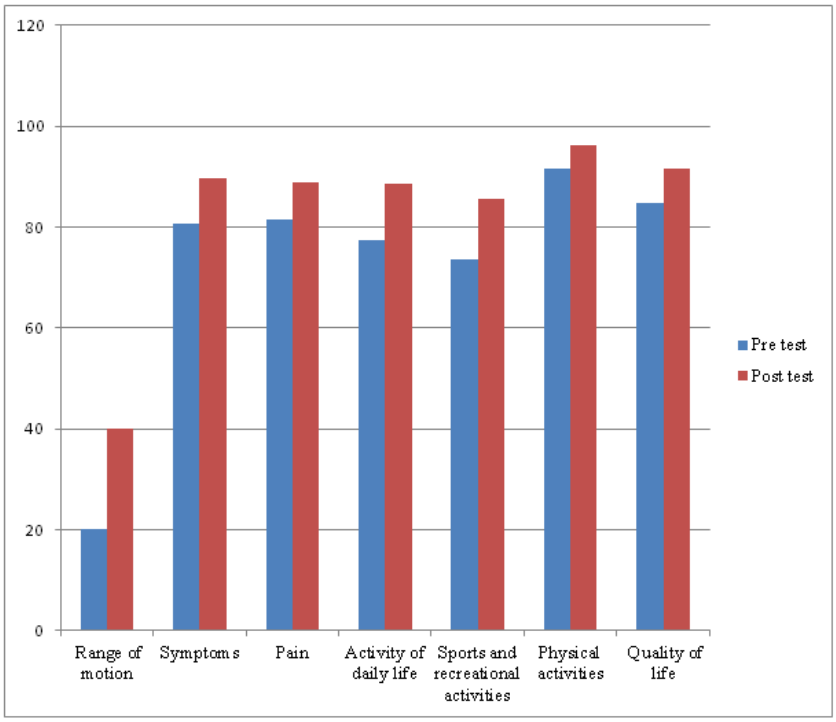

Table 2

Table 2 Shows the mean, standard deviation, paired "t" value, "p" value of group-B

S.no	group-b (experimental)	mean		Standard deviation		Paired "t" value	"p" value
		Pretest	Posttest	Pretest	Posttest		
1.	ROM	20.266	40.133	5.297	7.029	13.227	0.000
2.	SYMPTOMS	80.829	89.752	8.602	4.015	4.654	0.000
3.	PAIN	81.433	88.833	7.098	4.616	6.734	0.000
4.	ADL	77.333	88.666	9.611	6.399	6.107	0.000
5.	SPORT/REC	73.538	85.612	7.733	6.204	5.255	0.000
6.	PA	91.666	96.333	13.908	10.082	1.793	0.095
7.	QOL	84.666	91.666	9.536	4.498	3.609	0.003

According to table 2, ($p<0.005$) outcome is significant for the study., ROM (Range Of Motion) is significant ($p=0.000$)., SYMPTOMS subscale is significant ($p=0.000$).,PAIN subscale is significant ($p=0.000$). ACTIVITY OF DAILY LIFE (ADL) subscale is significant($p=0.000$)., SPORTS AND RECREATIONAL ACTIVITY (SPORT/REC) subscale is significant ($p=0.000$)., PHYSICAL ACTIVITY (PA) subscale is not significant ($p=0.095$)., QUALITY OF LIFE(QOL) subscale is significant($p=0.003$).

Graph 3

Graph 3 Shows the variation in mean value of post test of group-A and group-B

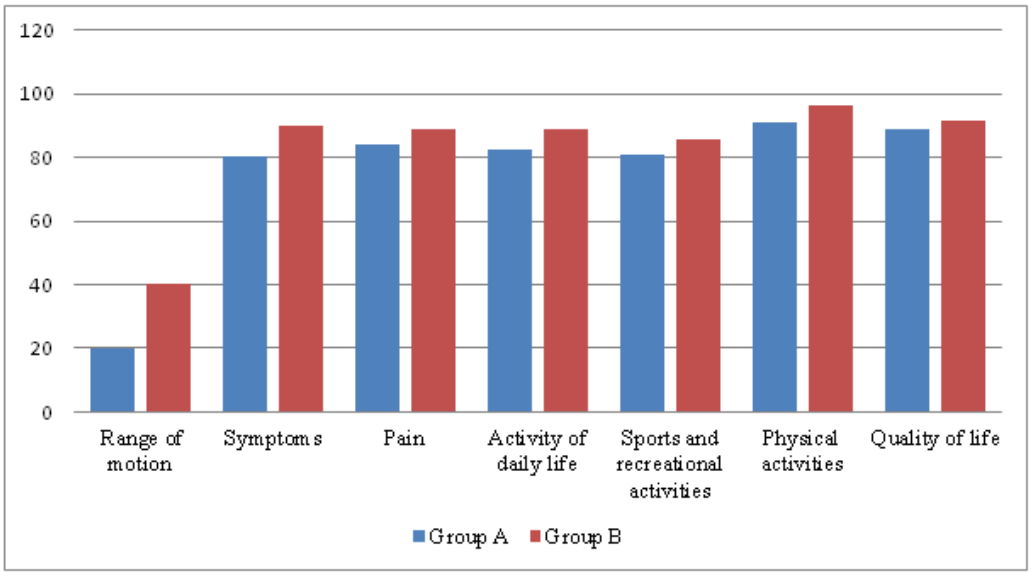

Table 3

Table 3 Shows the mean, standard deviation, paired "t" value, "p" value of Post test of group-A and group-B

S.no	Post test	mean		Standard deviation		Independent "t" test	"p " value
		Group a	Group b	Group a	Group b		
1.	ROM	20.13	40.13	3.92	7.02	9.621	0.000
2.	Symptoms	80.40	89.75	7.82	4.01	4.116	0.000
3.	Pain	84.35	88.83	5.13	4.61	2.514	0.018
4.	ADL	82.33	88.66	8.42	6.39	2.319	0.028
5.	Sport/REC	81.03	85.61	9.33	6.20	1.580	0.125
6.	PA	90.83	96.33	8.79	10.08	1.592	0.123
7.	QOL	88.66	91.66	3.51	4.49	2.034	0.052

According to table 3, ($p<0.005$) outcomes significant for the study.,ROM (Range Of Motion) is significant ($p=0.000$)., SYMPTOMS subscale is significant ($p=0.000$)., PAIN subscale is not significant ($p=0.018$). ACTIVITY OF DAILY LIFE (ADL) subscale is not significant ($p=0.028$)., SPORTS AND RECREATIONAL ACTIVITY (SPORT/REC) is not significant ($p=0.125$)., PYSICAL ACTIVITY (PA) subscale is not significant ($p=0.123$)., QUALITY OF LIFE (QOL) subscale is not significant($p=0.052$).

Figure 1: ***Passive bilateral hip adductor stretching.***

Figure 2: ***Passive PNF hold relax technique.***

Figure 3: ***Measuring the hip abduction range of motion.***

Table 1, shows there were the no significant effects on the Group-A players comes under the study. Compare of pre-test and post-test of the Group-A (CONTROL GROUP). Table 2, shows there were the significant effect on the Group-B Players comes under the study $p<0.005$(Range Of Motion, Symptoms, Pain, Activity of Daily Life, Sports and Recreational activity, Quality Of Life),There was no significant effect in Physical Activity ($p=0.095$) . Compare of pre-test and post-test of the Group-B (EXPERIMENTAL GROUP). Table 3, shows there was the significant effect in the components at Range Of Motion, Symptoms ($p<0.005$).there was the no significant effect in the components of the Pain ($p=0.018$), Activity Of Daily Life ($p=0.028$), Sports and Recreational activity ($p=0.125$), Physical Activity ($p=0.123$), Quality Of Life ($p=0.052$).

DISCUSSION

The study used to find out the effect of proprioceptive neuromuscular facilitation and sustained stretching with hip adductor tightness in field hockey players. From the statistical analysis we finds that GROUP B i.e. experimental group is significant than the GROUP A i.e. control group. This result goes in hand with YUKTASIR et.al (2007) who states that the proprioceptive neuromuscular facilitation and static stretching was effective in increase in range of motion for 6 weeks follow up. From the data analysis of this study, the range of motion ($p<0.005$) is significantly increased after the post-test of the experimental group for 4 weeks follow up, Hence our study is also get correlate with the study of YUKTASIR et.al. SCOTT G.SPERNOGA et.al (2011) concluded that PNF (hold relax) technique was highly effective protocol in increase the range of motion for shortened muscle fibres also reduce in the pain. The result of our study shows the increase in range of motion ($p<0.005$) and decrease in pain ($p<0.005$) is significantly proved, Hence in our study also gives same results and correlates with study of SCOTT G.SPERNOGA et.al study. KUMAR PRAVEEN AND MOITRA MONICA (2015) has informed that proprioceptive neuromuscular facilitation and static

stretching is effective manoeuvre technique to reduce the pain, improve range of motion, and increase the flexibility of the hamstring. Our study also gets the same outcomes in the experimental group at the measures of range of motion, pain free movements in the hip adductor group of muscles and it also positively correlates with the above study mentioned by KUMAR PRAVEEN AND MOITRA MONICA. D J DOWSAN et.al (2015) states that there is improvement in the range of motion in adductor muscles of sub-elite football players by giving stretching protocol. The subjective assessment that was done using HAGOS questionnaire shows that there is decrease of pain, symptoms and there is increase in the activity of daily life, sports and recreational activities and quality of life. This study also goes in hand with our study, which was mentioned by D J DOWSAN et.al. Acute musculo-skeletal injury may occur either due to direct trauma or indirect trauma. In indirect trauma, the injury can be occurred through active or passive injury. The mechanism of active injury is commonly due to eccentric overload of the muscle, that usually occurs as micro trauma, Severity of the injury is caused by the forces which placed on the specific muscle with some abnormal muscular contraction. Mild Stretching is advocate for the acute strain injury.[24] Muscle tightness is occurred due to the imbalance or counteract of the muscle. The eccentric overload that occurs in the lower limb compensate the load of the other or adjacent limb that get pulled towards the centre of gravity for the balance, which constantly happens vice-versa in both the athletes and other sports players. In adjacent group muscles there will be bridging of A band and I band. It will further increase pain by secretion of lactic acid form the myofibrils this prevents further damage of muscle. Every player should undergo stretching and warm-up before the practice or sports event. After the completion of the event cool-down stretching is mandatory for every players. The awareness of post-match injury in the groin should be given for every individual player.[9] Static stretching were the interventional measures given to increase the muscle length and range of motion of the joint; PNF stretching decreases the pain from the muscle tightness and increase the flexibility of the muscle.[25] Adductor muscles primary function is the internal rotation of the hip and adduction of the hip joint.[5] During the play of the sports event or in practice session player not aware in the muscle imbalance before and after every game session they should know the tightness and precautions in the strain of muscle.[6] 20 per 100 players get injured every year.[4] From our study we states that proprioceptive neuromuscular facilitation technique and sustained stretching is effective intervention for the adductor tightness with the grades of grade 1 and grade 2.

CONCLUSION

The study concludes that there is significant improvement in hip adductor tightness for field hockey players through Proprioceptive Neuromuscular Facilitation and sustained stretching exercises. The components includes Range Of Motion, Symptoms, Pain, Activity of Daily Life, Sports and Recreational activity, Physical Activity, Quality Of Life.

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First and foremost I would like to thank the almighty, who showered his blessings in all walks of my life. I submit my heartfelt thanks to Mrs.D.MALARVIZHI, M.P.T., DEAN INCHARGE for the valuable advice and guidance towards this work. I sincerely acknowledge and convey my heartfelt gratitude towards my guide Mr.P.KAMALANATHAN, M.P.T., ASSOCIATE PROFESSOR for his constant support and encouragement. He spared his valuable time, skilled knowledge & effort towards the successful completion of my project with great kindness. I would like to thank all of my staff members of SRM COLLEGE OF PHYSIOTHERAPY, for their valuable guidance and also gave me helping hands whenever needed. I extend my gratitude to all the Participants who consented to be the models for my study, without whose consent my study would be incomplete. I thankful for the institution SPORTS DEVELOPMENTAL AUTHORITY of INDIA given the permission in the study to take the subjects.

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SP-14

PREVALANCE OF HIP ADDUCTOR MUSCLE TIGHTNESS AMONG MALE COLLEGIATE STUDNETS

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ABSTRACT

The purpose of the study is find out the prevalence of the hip adductor muscle tightness among male collegiate students. Hip adductors are the prime contributors of the stability of hip and knee joint. Strong hip adductor muscle prevents injury among athletic population. A non-experimental design observational study conducted on 100 healthy male participants. The study included 18 – 22 years male college going students and excluded any recent injury and joint instability of lower extremities. Groin flexibility test was used to assess the hip adductor tightness and was measured using inch tape. The study results in higher prevalence of fair and poor flexibility of hip adductor muscle. The study concludes with higher prevalence of hip adductor tightness among male collegiate students. This may have an impact on the quality of life among students needs to be investigated.

KEYWORDS: ***hip adductor tightness, prevalence, male students, groin flexibility test***

INTRODUCTION

Hip adductors are the major contributors of overall strength and stability of the body. Hip adductors consists of 5 muscles (Pectineus, Gracilis, Adductor brevis , Adductor magnus, Adductor longus) that contribute 22.5% of total mass of lower extremity.[3] Adductors of hip are stabilizing the medial knee and also stabilize hip joint on weight bearing. Thus hip adductor helps in prevention of injury. Due to increased sedentary lifestyle and decreased physical activity there is chance of developing hip adductor tightness. Adductor muscle tightness leads to major cause of athletic injury among various sports players.[9,11] A study on injuries to soccer players accounts for 25 % of knee injuries due weak stabilizers of knee(hip adductors) [5,6,7] In recent years development of hip adductor tightness is common among young individuals. But there are less evident studies that evaluate the prevalence among young male college students. Thus this study is done to find out the prevalence of adductor muscle tightness among male collegiate students.

METHODOLOGY

Study deisgn
A non-experimental design observational study was carried on 100 male individuals.

Study setting
SRM College of physiotherapy, SRM institute of science and technology.

Subjects
The study included the age of 18 -22 years healthy male college going students. The study excluded any recent injuries in lower extremity, joint instability, congenital deformities of lower extremities.

Test procedure
Subjects were informed about the procedure and consent was taken. Groin flexibility test is used to assess the hip adductor muscle tightness. The test is carried out using inch tape or ruler. The subject is asked to sit on the floors with knee bent, your feet flat on the floor and legs together. The subjects are instructed to grab

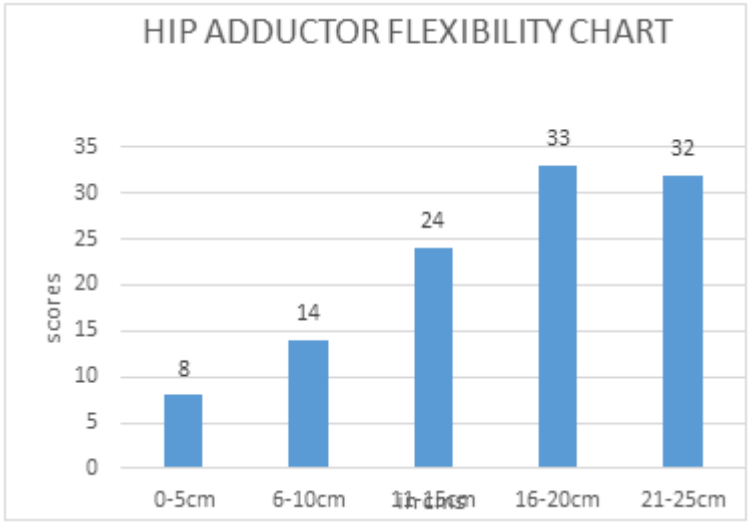
the ankles with both the hands and pull them as close to their body. The distance from the heel to the groin is measured with help of the inch tape.

Scoring procedure

The flexibility of hip adductor muscle is categorized into excellent (5 cm) and poor (25 cm).

RESULT

In this study 100 male college going students were assessed for hip adductor tightness. Only 8% of the total population had excellent groin flexibility. 35 % of the population had resulted with fair groin flexibility. While 32 % resulted for poor groin flexibility.



In Graph 1.1

Represents the hip adductor tightness among male collegiate students. 8% of the total population had excellent groin flexibility. 35 % of the population had resulted with fair groin flexibility. While 32 % resulted for poor groin flexibility.

DISCUSSION

Hip adductor tightness is a developing musculoskeletal discomfort in young population. Hip adductor muscles accounts for major stability of hip and knee joint and prevents injury of lower extremity [8]. The adaptive shortening of hip adductor muscle leads to decreased joint range of motion and affecting the activities of daily living. Injury prevention is major concept prevails in sports medicine around the world. Many sports athletes reported for injuries had a less flexibility of lower limb which eventually affects the balance and coordination of the body.[6,7] Prolonged sitting throughout the day like IT professionals and students have adaptive shortening of hip muscles.[1] Students who sit for more than 6 hours in the classroom have less physical activity and chances of developing muscle tightness. Thus this study evaluated the tightness of adductor muscle of young population which may affect their quality of life. Proper ergonomic guidelines, frequent activities in between classes, stretching and strengthening of muscles could reduce the severity of discomfort. This may also help the students to overcome their psychological stress and improve their quality of life. Increased physical activities among college students should be encouraged to make the physically, mentally, socially fit in the society. This study concentrates more on hip adductor muscle because of its major contribution for stability and injury prevention among the young population and decrease the level of disability.

Limitation of the study

The study focused on male healthy individuals while female population can be included in further study. Proper posture education and physiotherapy management can be given. Evaluation of physical performance and quality of life can also be done to provide strong evidence to support this article.

CONCLUSION

The study concludes that there is higher prevalence of hip adductor tightness among male collegiate students. Proper physiotherapy management and ergonomic advices should be administered to prevent disability and improve the quality of life.

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SP-15

ROLE OF PHYSIOTHERAPIST IN PCOS - A SYSTEMATIC REVIEW

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ABSTRACT

Polycystic ovarian syndrome (PCOS) is an endocrinopathy that affects women of reproductive age, whose main clinical features include menstrual dysfunction, infertility, clinical and biochemical hyperandrogenism. This systematic review is to analyse with evidence whether physiotherapy has an effect on PCOS. 120 published articles from indexed journals on PCOS & Physiotherapy are been collected from 2000-2018 with PRISMA guidelines. Subtitles to be used are PCOS, Effects of exercise on PCOS, role of physiotherapists in PCOS, obesity & various modes of exercises. Physiotherapist should diversify from musculoskeletal to emerging areas such as PCOS, Diabetes, onco- rehabilitation, geriatric care in view of future thrusts for job potential and our role to be more carved and established.

KEY WORDS: PCOD - Polycystic Ovarian Syndrome (synonym)PCOS – polycystic ovarian syndrome, HIIT – High Intensity Interval Training, RCT – Randomised Control Trial, PRISMA – Preferred Reporting Items for Systematic reviews and Meta – Analysis, AT – Aerobic Training, PRT – Progressive Resisted Training

INTRODUCTION

- Polycystic ovarian syndrome (PCOS) is an endocrinopathy that affects women of reproductive age, whose main clinical features include menstrual dysfunction, infertility, clinical and biochemical hyperandrogenism [(1,2)].
- Most reports have studied adult women with age ranged from 18 to 45 years with 9.13% of PCO'S cases have been identified in India & 3.7% in young women [(3)] and the 40-60% of women are obese [(4)]
- PCOS affects women of reproductive age & is primarily characterised by ovulatory dysfunction and hyperandroganism[(5,6)]. The hormonal & menstrual irregularities that define PCOS put women at risk for infertility. The continuous endometrial stimulation resulting from unopposed estrogen also increases the risk of endometrial hyperplasia & increase the risk of endometrial cancer [(7)]. The women with PCOS had significantly light levels of psychological distress than the general population.
- Physical inactivity, weight gain and genetic predisposition play an important role in clinical expression of PCOS [(8)]
- Physical activity is a key component of any lifestyle modification or weight maintenance regime. It can facilitate weight control through direct energy expenditure [(9)]
- Making positive lifestyle changes are key to manage PCOS where diet and exercise are two of the main areas need to be addressed for these lifestyle changes to be successful [(10)]

AIMS AND OBJECTIVES

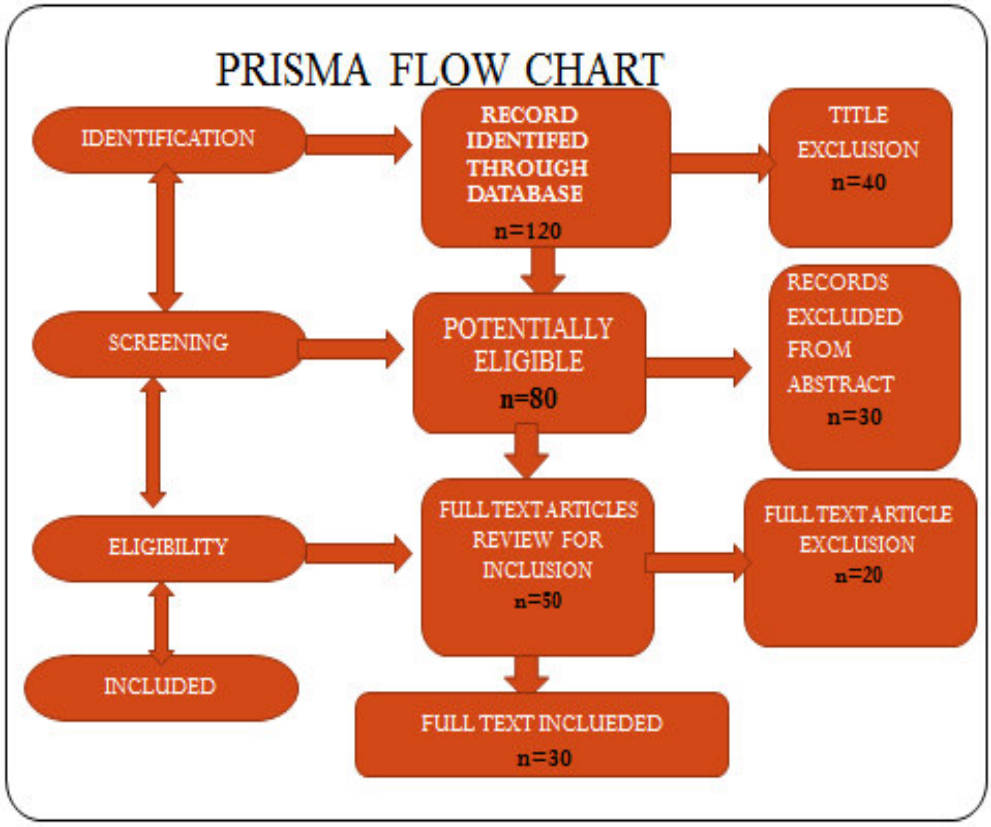
This systematic review is to analyse with evidence whether physiotherapy has an effect on PCOS.

MATERIALS AND METHODOLOGY

120 published articles from indexed journals on PCOS & Physiotherapy are been collected from 2000-2018 with PRISMA guidelines. Subtitles to be used are PCOS, Effects of exercise on PCOS, role of physiotherapists in PCOS, obesity & various modes of exercises.

PRISMA FLOW CHART

- The aim of the PRISMA statement is to help authors improve the reporting of systematic reviews and meta- analyses .We have focused on randomized controlled trails .
- But PRISMA can also be used as a basis for reporting systematic reviews of other types of research particularly evaluations of interventions.



NEED OF THE STUDY

As PCOS are more prevalent globally and an increasing trend in India, lesser researches with the role of physiotherapist are available hence this systematic review gets more significant

RESULTS AND DISCUSSION

An increased QOL among women with PCOS with RET and AT as evidenced by below studies

Table 1
Quality of Life

Author Name	No. Of women Participant	Duration in weeks	Method	Age in years	Result
Ramos etal 2016 (11)	51	16	RET	18-37	Decrease Testosterone Levels Increase Social Aspects, Increase QOL
Alves etal 2015 (12)	43	16	RET	18-37	Increased QOL

The American college of sports medicine recommends 200-300 minutes of moderate exercises per week to facilitate long term maintenance of weight loss & prevent weight regain in overweight adults [13] as supported by the following research reports

High intensity interval training (HIIT)

Table 2
Physical activity

Author Name	No. Of Participant	Duration& frequency	Method	Age in years	Result
Almenning et al 2015 (14)	-	10 weeks thrice week	HIIT	27-30	• Increased Homeostatic Model Insulin Resistance • HDL increased • Fat % decreased
Maillard etal 2018 (15)	617		HIIT		Reduced fat mass

Progressive resistance training

Progressive resistance training (PRT) is the most potent exercise modalities for improving skeletal muscle mass and quality. [16]. PRT can counteract metabolic diseases including insulin resistance. [17] and PCOS [18].

Author Name	No. Of women Participant	Duration and frequency	Method	Age in years	Result
Lisa vizza et al 2016 (19)	-	6 months. Twice a week	PRT	18-42	Reduced Infertility Problem
Gislaine et al 2015 (20)	97	4months thrice a week.	PRT	18-37	• Reduced Waist circumference • Reduced Testosterone • No change in insulin snesitivity

Aerobic Training

Aerobics exercise is a definite tool in decreasing body weight in obese infertile women with PCOS, it helps in reducing the cyst size , increasing the ovulation and improved pregnancy rate [21]

Author Name	No. Of women Participant	Duration and frequency	Method	Age in years	Result
Leann etal 2011 (22)	8	16 week 5 times /week	AT	-	• Increased Ovarian Volume • Significant reduction in the Total No of Follicles
Mohammad et	24	12 weeks	AT	22-37	• Reduced Ovarian

al 2011. (23)					Size. • Reduced Fasting insulin and testosterone hormone.

Life style modifications have been proposed to improve both metabolic and reproductive manifestations of PCOS [5] as evidenced by researchers shown below.

Table 3
Life style modifications

Author Name	No. Of women Participant	Duration in months	Method	Age in years	Result
James Mcintosh 2015 (24)	149	4	Lifestyle modification with exercise	18 – 40	Increased onvulation than other group with birth control pills
Jenni Glenn 2015 (25)	149	4	Lifestyle modification with exercise	18 – 40	• Increased delivery rates • Reduced triglycerides
Shaddy Grove 2015 (26)	50	4	Lifestyle modification with exercise	18- 40	• Increased Delivery rates

LIMITATIONS

Limitations of this systematic review was only the role of (HIIT, AT, RET) various modes of exercises were analysed but not with the level of evidence. Also the impact of these means of therapy on its direct impact on the number and size of cyst were not evaluated. Further meta - analysis studies involving RCTs with more measurable variables like diet, counselling, gym activities, aqua therapy, yoga are recommended.

CONCLUSION

Physiotherapist should diversify from musculoskeletal to emerging areas such as PCOS, Diabetes, onco-rehabilitation, geriatric care in view of future thrusts for job potential and our role to be more carved and established.

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SP-16

POSITIONAL VARIATIONS AND CHEST EXPANSION AMONG HYPERKYPHOTIC ELDERLY POPULATION

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ABSTRACT

BACKGROUND**:** Thoracic hyper kyphosis is the excessive antero-posterior curvature of the thoracic spine greater than 40°. The exact prevalence of patients for hyper kyphosis is unknown, yet it is estimated that 10% to 45% aged over 50 years are diagnosed. Thoracic hyper kyphosis increases to 50% in men and 65% in women over the age of 65 years. If not treated, people can have difficulty in bathing, getting out of a chair, bending, walking, balance changes that may result in falls and injury. OBJECTIVE**:** To assess the influence of hyper kyphosis on chest expansion in various positions among elderly adults. METHODOLOGY**:** A non-experimental observational study was conducted with a convenient sampling of 20 samples in the age group of 45-65, in an old age home near Ambattur, Chennai. An x-ray of the thoracic spine was obtained for every individual and their Cobb's angle was assessed. A MRC dyspnoea scale was used to assess the breathlessness. An inch tape was used to measure the chest expansion at different levels in varying positions. RESULTS**:** The hyperkyphotic population had compromised chest expansion more in standing and side lying $p<0.05$. CONCLUSION**:** In this precise hyperkyphotic population**,** chest expansion is decreased because of altered musculoskeletal relationship. When considering the change of positions, chest expansion is compromised more in side-lying and standing, then in supine lying and sitting. Therefore, chest expansion exercises should be emphasized more in side-lying and standing when compared to other positions.

KEYWORDS: ***Hyper kyphosis; Chest expansion; Elderly adults; MRC Dyspnoea scale; Cobb's angle***

INTRODUCTION

Age-related hyper kyphosis (ARH) is an enlarged anterior curvature of the thoracic spine. It is associated with aging. It can develop from wither muscle weakness leading to vertebral fractures or from initial vertebral fractures that precipitate the development of ARH. [1] However regardless of vertebral fractures, ARH is not uncommon in women. Its incidence increase 6-11% with every 10 years increase in age. [2] Although the natural history of ARH is not fully identified, the general causes that have been reported are bad posture, dehydration of the intervertebral disks, and reduced back extensor muscle strength. [3]ARH is a condition that leads to impairment of mobility. Elderly women with ARH have cited struggles in performance of physical activities. [4] ARH also causes limitation in the movement of the rib cage, which is connected to the thoracic spine, resulting in difficulties with pulmonary function. [5] Horie et al. [5] reported that the thoracic vertebrae forms cost transverse joints with the head of the rib that is directly connected to the rib cage. It suggests that there is a close relationship with the expansion capabilities of the rib cage during inhalation. Although alignment of vertical column and changes in the same in elderly women are clinically important to health and quality of life, most studies have also concentrated on measurement of the thoracic kyphosis angle, muscle strength, range of motion, and physical performance after an intervention. In addition, A few studies have been conducted on measurement of chest functions. However there is lack of research to determine the compromised position. If the chest expansion in various positions could be assessed determining the compromised position and provide the necessary intervention, difficulty in breathing can reduced and this will ensure performance of Activities of daily life without any hurdles. Therefore the objective of this study is to assess the positional variations and chest expansion among Hyperhyphotic elderly.

MATERIALS AND METHODS

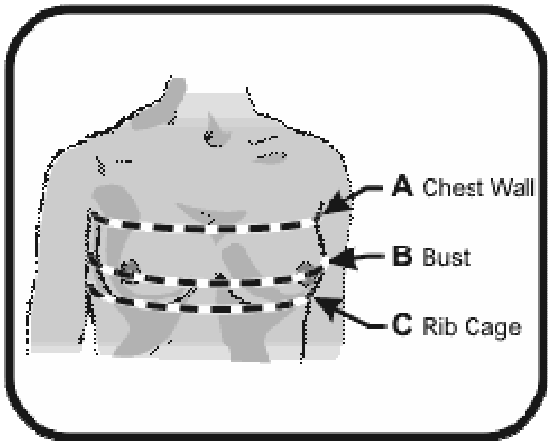
A non-experimental, observational study was conducted among 20 samples who have thoracic Hyperkyphosis between the age group of 45-65, both males and females (more) in an old age home in Ambattur, with their Cobb's angle greater than 40º in the thoracic region as measured with the spinal x-ray were selected. Subjects with chronic obstructive lung disease, scoliosis, coronary artery disease, open heart surgery, rheumatic heart disease, chronic renal failure, smoking and alcoholism were excluded from the study. Twenty eligible subjects were selected and assessed for breathlessness using the MRC (medical research council) dyspnoea, scale graded from 1 to 5. Chest expansion was measured (in inches) using an inch tape in three levels i.e. Axilla level, Nipple level, Xiphisternum level in positions such as side lying (both right and left), standing, sitting and supine lying.The compromised position was obtained from the statistical data and feedback was given to the subjects and the physiotherapist present in the old age home on the obtained results and suggested to provide the necessary exercises to them.

RESULTS AND DISCUSSION

The main purpose of this study was to assess variations in positions and chest expansion among elders with hyper kyphosis. Hyper kyphosis is an exaggerated anterior curvature of the spine. It causes difficulty in mobility that limits their ability to lead a quality life. [4] It also limits the movement of the rib cage, which is connected to the thoracic spine resulting in difficulties with pulmonary function. [5] Horie et al [5] reported that the thoracic vertebrae forms cost transverse joints with the head of the rib, which is connected to the rib cage, thereby suggesting that there is a close relationship with the expansion capabilities of the rib cage during inhalation. Seok Jeong Lee et al [6] identified that respiratory complications are found in many of the patients suffering from hyper kyphosis. Such complications may progress to be adverse enough to require hospitalization. Thoracic insufficiency syndrome, in extensive congenital scoliosis is the inability of the thorax to support normal respiration or lung growth. Similar to scoliosis, patients with Hyper kyphosis also face respiratory problems due to the decrease of vertebral height and subsequent lung volume reduction as a result of restrictive disease. In our study, it was observed that, the subjects had compromised chest expansion which could be either due to the age factor or Hyper kyphosis and this was the case in all the positions. The assessment of breathlessness gave a result ranging from 2 to 3 as scored using MRC dyspnea scale. The relationships between the degree of spinal curve and other health outcomes have been controversial. In a systematic review, there was no proof to convey that there is relationship between the sagittal spinal curve and other health outcomes [13]. Only one group reported that there is higher prevalence of dyspnea and lower lung function in Hyper kyphosis patients [1]. However, even they did not address respiratory complications other than dyspnea. Several studies indicated the prevalence and predictors of respiratory complications after surgical correction, and the endpoints in these studies were variable postoperative complications. But there wasn't an explanation as to how the chest expansion varied from position to position in such Hyperkyphotic patients. This gap needs to be addressed and it is essential to do so because such Hyperkyphotic patients find it difficult to take up their daily activities due to difficulties in breathing. This study fills up the emptiness. It has been observed that chest expansion is decreased in all positions but a drastic decrease has been observed in side lying and standing.

Figure 1

Shows the chest wall measurement at three different levels



A- AXILLA LEVEL, B- NIPPLE LEVEL, C- XIPHISTERNUM LEVEL

Table 1

Shows the correlation and the t values and p values of different positions at axilla level.

Axilla level	Supine lying		Standing		Sitting		Side lying(left)		Side lying(right)	
	T value	P value	T value	P value	T value	P value	T value	P value	T value	P value
Supine	-	-	13.426	0.00001	12.7511	0.00001	12.7511	0.00001	12.7511	0.00001
Standing	13.426	0.00001	-	-	29.1982	0.00001	0.2946	0.385747	0.2521	0.401835
Sitting	12.7511	0.00001	29.1982	0.00001	-	-	35.5891	0.00001	27.8632	0.00001
Side lying (left)	12.7511	0.00001	0.2946	0.385747	35.5891	0.00001	-	-	0	0.5
Side lying (right)	12.7511	0.00001	0.2521	0.424499	27.8632	0.00001	0	0.5	-	-

Table 2

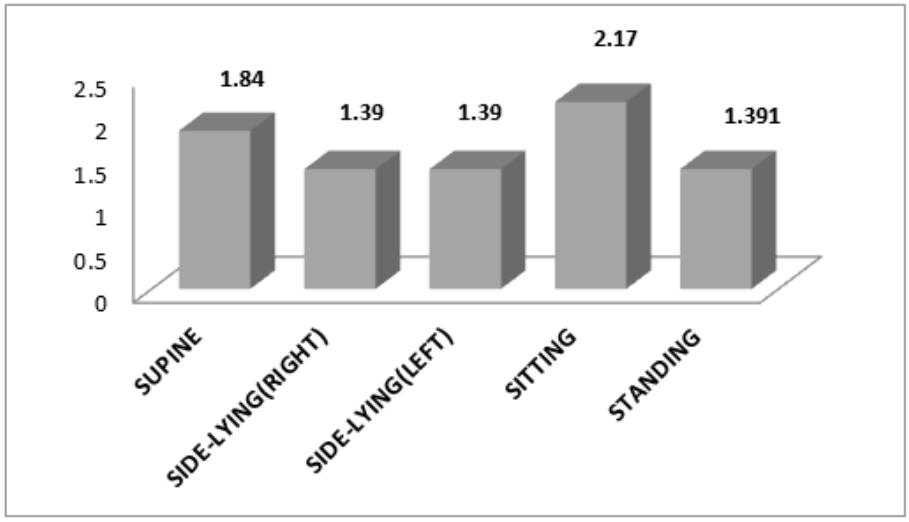
Shows the correlation and the t values and p values of different Positions at nipple level

Nipple level	Supine lying		Standing		Sitting		Side lying(left)		Side lying(right)	
	t Value	p Value	t Value	p Value	t Value	p Value	t Value	p Value	t Value	p Value
Supine	-	-	12.1874	0.00001	9.2643	0.00001	13.4023	0.00001	13.7054	0.00001
Standing	12.1874	0.00001	-	-	23.9366	0.00001	0	0.5	0.7667	0.22634
Sitting	9.2643	0.00001	23.9366	0.00001	-	-	27.3354	0.00001	25.0566	0.00001
Side lying (left)	13.4023	0.00001	0	0.5	27.3354	0.00001	-	-	1.3718	.093054
Side lying (right)	13.7054	0.00001	0.7667	0.22634	25.0566	0.00001	1.3718	.093054	-	-

Table 3
Shows the correlation and the t values and p values of different positions at Xiphisternum level

Xiphi-sternum level	Supine lying		Standing		Sitting		Side lying(left)		Side lying(right)	
	t value	p value	t value	p value	t value	p value	t value	p value	t value	p value
Supine	-	-	17.9702	0.00001	9.2916	0.00001	17.9702	0.00001	20.3686	0.00001
Standing	17.9702	0.00001	-	-	25.298	0.00001	0	0.5	1.3718	.093054
Sitting	9.2916	0.00001	25.298	0.00001	-	-	25.298	0.00001	25.1206	0.00001
Side lying (left)	17.9702	0.00001	0	0.5	25.298	0.00001	-	-	1.3718	.093054
Side lying (right)	20.3686	0.00001	1.3718	.093054	25.1206	0.00001	1.3718	.093054	-	-

Graph 1
Shows the mean values of chest wall measurement at three different levels in changing positions.



CONCLUSION

As with the statistical results, chest expansion is decreased because of altered musculoskeletal relationship. When considering the change of positions, chest expansion is compromised more in side-lying and standing, then in supine lying and sitting. Therefore, chest expansion exercises should be emphasized more in side-lying and standing when compared to other positions. The limitations of this study are sample size was small, study was pertained to a particular population, errors could have been made in the measurement using the inch tape. Recommendations for further study are larger sample size can be used, study could be done on wider population, a comparison between males and females can be done.

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CONFLICT OF INTEREST

There are no conflicts of interest.

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SP-17

AN ANALYSIS OF PHYSICAL ACTIVITY AMONG FEMALE COLLEGIATE PHYSIOTHERAPY STUDENTS

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ABSTRACT

OBJECTIVE: Physical activity is considered as the important factor among physiotherapist. Several studies demonstrate lack of physical activity are prevalent cause of health problems. Though they work on the exercise prescription for the patients, the importance of self-application is comparatively less. Among the collegiate students of physiotherapy, Males are highly motivated for fitness, whereas the female students don't concentrate towards fitness regime. BACKGROUND: According to the WHO, global population of about 60% recorded that minimum of 30 minutes of moderate intensity physical activity is needed for the young population. Physical activity and inactivity of female collegiate students are analysed through various aspects and tests. In all developing countries, the levels of inactivity have been becoming virtually high and great problem even in rapidly growing cities. But there activity still remains same until they have been motivated towards the event. This study is to identify whether female collegiate students are aware of fitness and what the exercise regime they follow in daily life. STUDY DESIGN: Non experimental design, observational type. METHODOLOGY: The female physiotherapy students were recruited according to inclusion and exclusion criteria and informed consent is obtained in the study. A physical activity questionnaire is given to the students and the answers from the questionnaire is obtained according to the statistical analysis. RESULTS AND CONCLUSION: The results and conclusion will be disclosed at the end of study.

KEYWORDS: ***Physical activity, fitness regime, collegiate students.***

INTRODUCTION

Physical activity is consider as an important health factor among the young population, physical activity and exercises helps to decrease the diabetes, cardiovascular problems and degenerative diseases. Regular physical activity helps manage the anxiety, anger, stress, and depression. The exercise or physical activity plays major role in immediate and long term effects in body mechanism. This exercise physiology improves the quality of life. Physical fitness can be achieved by performing at least 30 minutes per day, 150 minutes of moderate exercises (or) 75minutes of vigorous exercises for week while it is for young adolescents. According to the WHO, global population of about 60% recorded that minimum of 30 minutes of moderate intensity physical activity is needed for the young population. According to worldwide 31.1% of young adolescents are physically inactive. World Health Organisation concludes that among young adolescents, female are less in physical activity level about 15.6% (India). The physical activity and the physical fitness is more important for physiotherapist because they have to be able to maintain the patients function in day to day life and they have to maintain their positions without any difficulties Whereas being physiotherapists we know to how to prescribe exercise but not to perform it on ourselves. Many researchers concluded that there is moderate to poor physical activity levels/habits. International Physical Activity Questionnaire (IAPQ) was used to assess the activity level of the students.

Aim of the study

The aim of the study is to analyse out the level of physical activity among female collegiate physiotherapy students.

Need for the study

They are more studies on physical fitness comparing male and female physiotherapy students, But only few studies have focused on female physical activity, so in this study we selected only female physiotherapy students to find out there physical activity level.

METHODOLOGY

Study design : Non experimental.
Study type : Observational Type.
Sampling method : Convenient sampling.
Sample size : 154

Inclusion criteria
Age group 17 Years to 20Years.
Female Physiotherapy students.

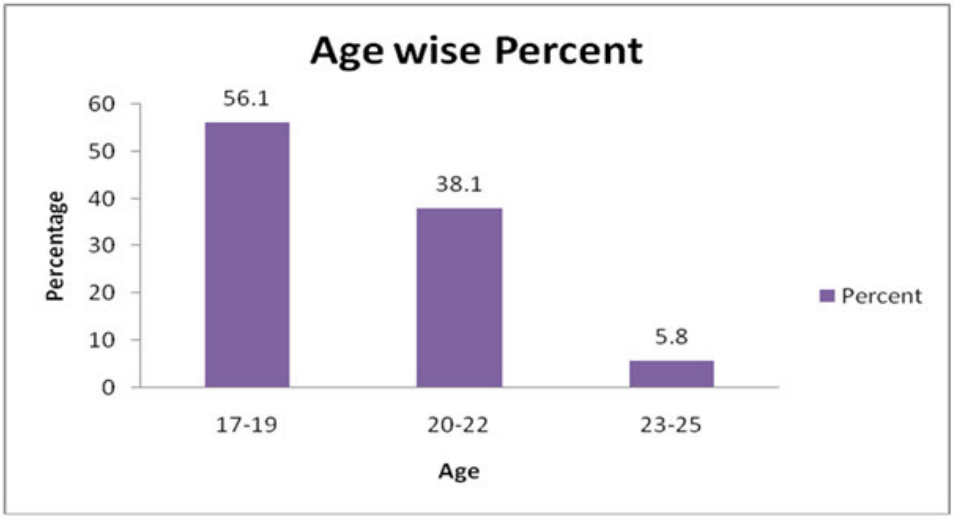
Exclusion criteria
Male are excluded in this study.
Who are not willing to participate were excluded in this study.

Procedure
The 154 participants were selected according to the inclusion and exclusion criteria, and a written informed consent is obtained from the participants after detailed explanation of the study. The participants are asked to fill the physical activity questionnaire, to find there activity level at home, college and recreational activities. The home activities such as: stair climbing, in and around activities in home. The activities in college such as: sitting, standing, walking etc. Recreational activities such as: swimming, cycling, exercises, dancing, playing.

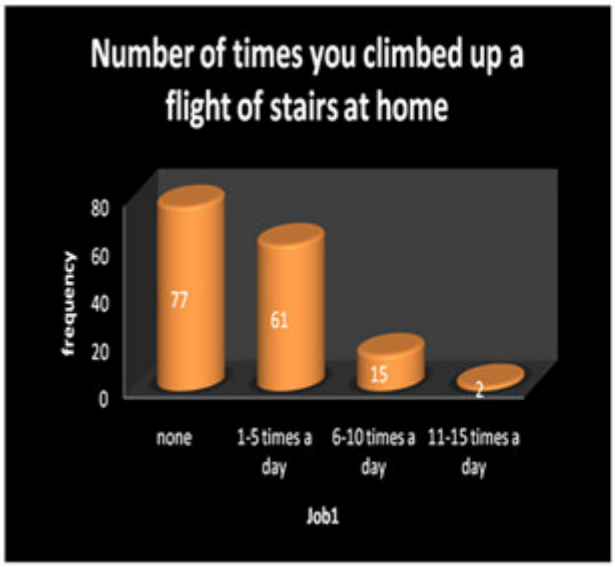
RESULTS

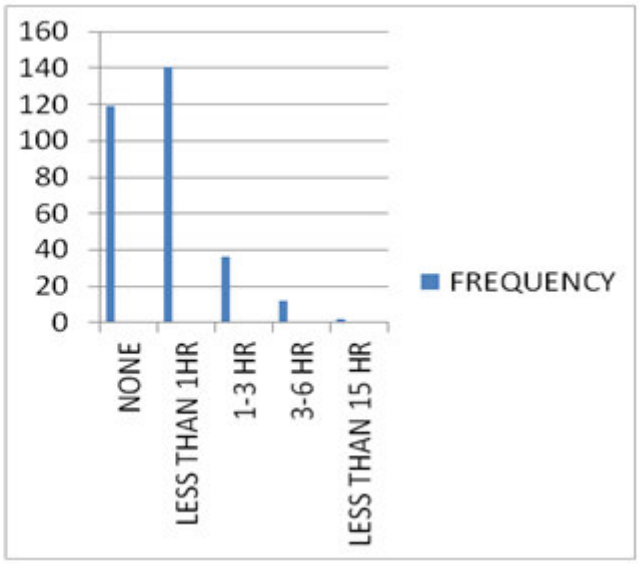
- Results were analysed by using the soft ware SPSS-16 and significant value is done using chi-square test.
- According to graph -1: different age groups in 17- 19 years are 56.1%, 20-22 years are 38.1% and 23-25 years 5.8% female physiotherapy students are present.
- According to graph 2 : it shows that 77% participants are not using the stairs , 61% are using the stairs 1-5 times ,15% are using 6-10times , and 2%are using 11-15 times in their daily activities at home, activities in and around home are also included.
- According to graph 3: A) the activity level at work in walking is 62.6% marked as no and 37.4% marked as yes. B) In standing the activity level is 63.9% marked as no and 36.1% marked as yes. C) In sitting 67.1% marked as no and 32.9 marked as yes.
- According to graph 5 : it shows that the none of the participants are not performing any activity for the last 12 months , the activities such as swimming, walking, racing, cycling aerobic exercises , floor exercises and dancing.

Graph 1 ***Age***

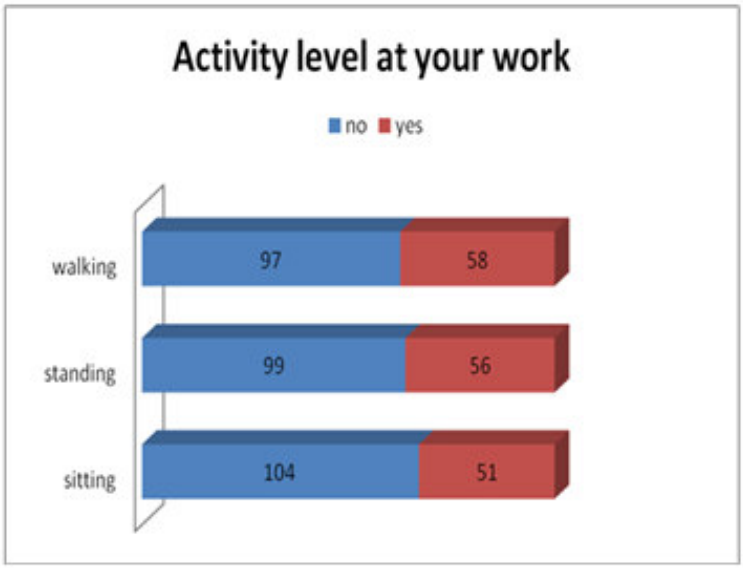


Graph 2
Home Activities

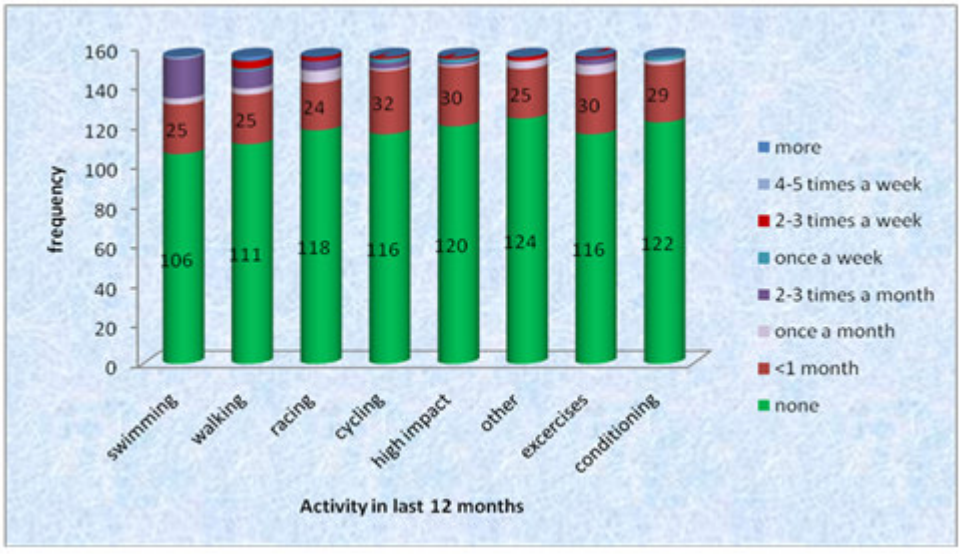




Graph 3
Activity Level at your work



Graph 4
Recreational Activities



DISCUSSION

- The physical education contrast with the findings and its demonstration over regular physical activity level is higher than the different population levels.
- As in Graph-1, shows that the age difference from 17-23, Where in 17-19 age group showed maximum physical activity participation. The tendency of reduction of the physical activity levels during career through a specific questionnaire elaborated for the study.
- Cerin et al, present study also verified a lower level of physical activity between the female physical education students when they were compared with males.
- As physical activity has become very important factor in life that too in females especially. We want to analyse physical activity in female collegiate physiotherapy students. As being a physiotherapist exercise prescription has to be given to all patients as one of the treatment protocol. In case physiotherapist should also be aware of their own physical activity. We have used physical activity questionnaire as a outcome measure for our study. Comparatively the three activities plays a major role in student life.
- Home activities
- Activities at work
- Recreational activities
- In case of home activities, majorly stair climbing, activities in and around home such as preparing food, shopping, browsing etc.
- Activities in work includes sitting, standing, walking.
- Recreational activities such as: walking, swimming, exercising, dancing, playing etc.

CONCLUSION

- From the above statistical analysis, the study concludes that, though there are various categories in each activity, the female collegiate physiotherapy students did not match, the least physical activity in a day for about 30 minutes.
- As a physiotherapist we rush towards physical fitness of others, but we have to think about ourselves to do physical activity in day to day life which is help full in treating patients.

Limitations and recommendations

- Only physical activity of home, work and recreational activities were only certain repeated activities are taken from the physical activity questionnaire.
- Physical exercises can be designed and used as intervention female collegiate physiotherapy students to prevent major diseases such as obesity, hypertension etc.
- Each subject can be given separate intervention with short term and long term duration.
- Physical activity tracker can be created and recommended to use it in their mobile phones.
- Physical activity based syllabus should be taught in academics, to bring awareness among female physiotherapists.

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SP-18

EFFECT OF LOW INTENSITY AEROBIC EXERCISE AND RESISTANCE TRAINING ON ATTENTION IN GERIATRIC POPULATION

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ABSTRACT

This study was aimed to find the effect of low intensity aerobic exercise and resistance training on attention in geriatric population. The objective of the study was to find the difference between pre test and post test valves of low intensity Aerobic exercise, Resistance training and Both on Attention by using Stroop test (color-word test). 30 Individuals are participated in the study based on the inclusion and exclusion criteria. Individuals were categorized into three groups A, B and C. Group A were given low intensity aerobic exercise which includes walking. Group B were given resistance training which includes strength training using Dumbbells. Group C were given both low intensity aerobic and resistance training. Hence Group A has lower time to complete the Stroop test, Group B has also lower time to complete the Stroop the test and Group C has Much lower time to complete the Stroop test. The study shows that individuals who were performed both low intensity aerobic and resistance training has a significant improvement in attention than the aerobic and resistance training given separately.

KEYWORDS: ***Low intensity aerobic exercise, Resistant training, Strength training, Walking, dumbbells, Stroop test.***

INTRODUCTION

Aging is a dynamic and progressive process in which morphological, functional, hemodynamic and psychological changes reduce the individual's ability to adapt to the environment. It is a complex process involving many variables (e.g genetics, lifestyle factors, chronic diseases. Attention is one of the important cognitive function implicated in a variety of daily living activities. Inorder to complete any cognitively planned activity, any sequenced action or any thought one must use sustained attention .It is the action of dealing with or taking special care of someone or something There are two types of attention: Active and Passive. . Active attention involves alertness, concentration, interest and hunger. It is voluntary. Passive attention refers to the involuntary process directed by external events that stand out from their environment, such as a bright flash, a strong odour, or a sudden loud noise[1.] It is a multidimensional cognitive process that includes the ability to select and focus on what is important at any given moment, the ability to consistently maintain mental efforts while performing task that requires mental energy and the ability to inhibit actions or thought while previewing alternative actions or thoughts while previewing alternative actions and thoughts. In other words it is a complex process that includes feeling alert and arousal selecting what we should be attending to, ignoring what we don't want to attend to, and maintaining our focus for the right amount of time. Alertness and arousal is the initial step in the attention process if we are going to do something or listen to someone the first thing that we need to feel alert and aroused. In other words we need to feel like our battery is charged like our brains have energy. Reticular Activating System controls this ability of being alert and arousal. It is located in the brain stem at the back of the neck it is the part of the brain that helps us feel alert and aroused when we wake up in the morning. Selectivity is the next step in attention process. At any moment, there are a multitude of stimuli that are potentially capable of capturing our attention because it is impossible to attend to them all we decided which ones are the most important. When students are in classroom, they may pay attention to what other students are doing, what is written in the board the color of their friends new shoe, someone talking down the hall or what teacher is saying. Our brain must concentrate on each moment to moment. Further, even when concentrating on a certain task there often parts that are most important than others and must be scrutinized closely. The ability to select most important part of task is called Saliency determination[2]. The part of brain that controls our ability to select

the most important or salient information is frontal lobes. Distractibility is the thing where we must filter out or ignore other things around us when we are concentrating in one particular thing. Distractions may be visual, such as other people who are near us or the birds in the tree just outside the window. They may be our own bodies such as feeling hungry or may be by our own thoughts[3]. Other mental distractions may be thinking about future or what is coming next instead of what is going on at the present time, such as what we are going to do over this weekend or the test we are going to have tomorrow[4] Previewing is also a component of attention. Impulsivity is the Inability to inhibit behaviour or to regulate behaviour by its consequences. The behaviour that need to be regulated may be cognitive (thoughts), verbal, emotional or motor[5]. Attention is more than just noticing incoming stimuli. It involves a number of processes including filtering out perceptions, balancing multiple perceptions and attaching emotional significance to these perceptions[6] Aerobic exercise (also known as cardio) is a physical exercise of low, moderate and high intensity that depend primarily on the aerobic energy generating process. Aerobic literally means relating to involving, or requiring free oxygen" and refers to the use of oxygen to adequately meet energy demand during exercise via aerobic metabolism. Low intensity exercises only slightly increase your heart and breathing rate and are suitable for older adults with a range of medical conditions that make exertion particularly difficult or dangerous. The most standard low intensity cardio exercise is walking. Walking is a simplest way to work out and easiest way to get more active, weight loss and become healthier During a resistance training workout, moving limbs against resistance provided by body weight, gravity band, weighted bars and dumbbells which increase muscle strength and endurance. Resistance is any force which makes the movement harder to perform. Hence exercise performed against resistance can be considered as a resistance or strength training. Older adults likely to have a better quality of life and to live longer. Hence physical muscles and attention "muscles" both have a limited amount of strength at any given time, their stamina and power can either atrophy from inactivity, purposeful exercise and they require rest and recovery after they have been intensely exerted. Exercises primarily helps brain ability to ignore distractions, and making an effort to focus all our energy on muscle strengthening can also increase attention. It is not only a ability to focus on single task without being distracted, it is also comprised of several different elements that must be effectively managed.

MATERAL AND METHODS

Study Design : Quasi Experimental study.
Study Setting : Saveetha college of physiotherapy,Saveetha University, Thandalam, Chennai- 602105
Sampling Method : Random sampling method
Sample Size : 30 Individuals
Inclusion Criteria : Both genders. Age 65-75 years
Exclusion Criteria : Arterial hypertension (BP >180/110mm hg) Diabetes mellitus (fasting glycemia>250mg/dl) Myocardial infarction Aortic stenosis Musculoskeletal disorders

Procedure

Low intensity aerobic exercise intervention

The aerobic exercise session began with a warm up period consisting 2 min of slow walking on a thread mill at a speed that elicited an HR of no higher than 85 beats /min. the speed of walking was then increased until the participants reached their predetermined THR . And then 10 min of walking at the THR was performed. At the end of the session a 2 mins cool down was performed, with the participant walking slowly.

Resistance training

Resistance exercises targeted the main muscle group used for daily activities. The exercise include biceps curls using thumbells of 5 pounds. The individual stands with a feet about hip- width apart and hold dumbbells in each hand. With the palm facing out, contracts the biceps and curl the weight up towards shoulder. Try not to move the elbow as you curl the weight up. Lower the weight back down, but keep a slight bend in the in the elbow at the bottom. Don't swing the weight and keep the elbows static as you curl the weight. With 12 repetitions. Group c performed resistance exercise and then performed 10 mins of thread mill walking.

Stroop Test

This procedure is done by 20 sequence of five colour words were printed on the paper. Each paper were given to the participants as they were asked to call out the colour of the ink and asked to call out the colour of the word. The average time taken to say the the colour of the ink and the colour of the word is noted. The average difference between the pre and post test results were calculated. Before and after intervention, pre and posttest values were calculated. When there is decrease in time consumption compare to the pre and posttest valves indicates the improvement in the outcome measures.

Table 1

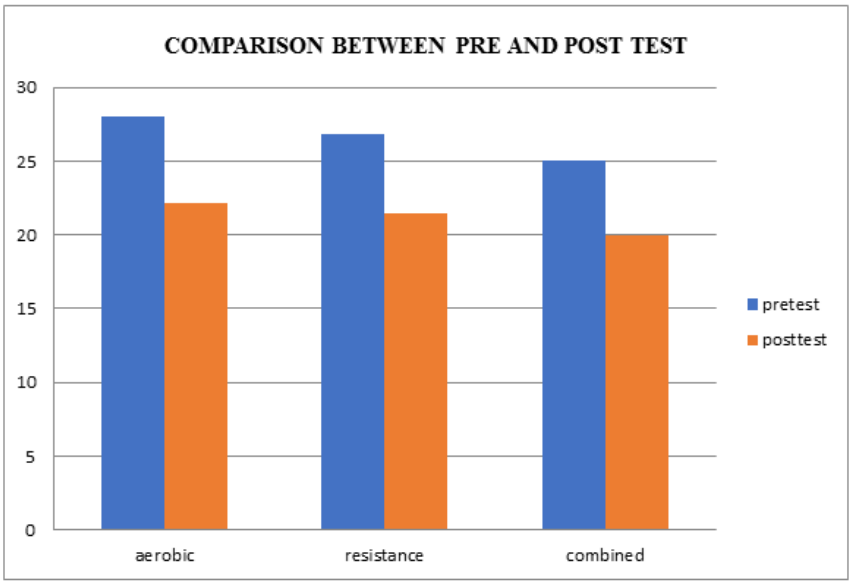
Pretest value of Stroop test

Group	Mean	Standard deviation	P value
Aerobic	28.01	1.88	0.001
Resistance	26.87	1.39	
Combined	25.05	1.36	

Table 2

Posttest value of Stroop test

Group	Mean	Standard deviation	P value
Aerobic	22.10	0.91	0.001
Resistance	21.47	0.94	
Combined	20	1.1	



RESULT

From the statistical analysis made with the quantitative data relieved a statistically slight difference between the pre test and post test. In the stroop test, for low intensity aerobic exercise the pre test mean is 28.01 with a standard deviation of 1.88 and the post test mean is 22.10 with a standard deviation of 0.91,For resistance training the pre test mean is 26.87 with a standard deviation of 1.39 , and for the post test Mean is 21.47 with a standard deviation of 0.94 and for both (low intensity aerobic exercise and resistance training) the pre test mean is 25.05 with a standard deviation of 1.36 and the post test mean is 20 with a standard deviation of 1.1.

DISCUSSION

Physical exercise benefits the health of the elderly by reducing the risk of developing diseases and also improving physical and mental fitness. However low intensity aerobic exercise are suitable for older adults which also has a beneficial effects on blood pressure, glucose tolerance, depression and quality of life.

Resistance training is associated with increased muscle strength and mass. The aim of this study was to determine the effect of low intensity aerobic exercise and resistance training on attention among geriatric population. 30 individuals fulfilling the inclusion criteria were assigned to his study by randomized technique. Subjects were categorized into three groups and Group A were given low intensity aerobic exercise, Group B were given resistance training and Group C were given both low intensity aerobic and resistance training. Stroop test is the tool for analyzing the attention and the procedure was explained. Chang & Etnier., 2009 Concluded that acute aerobic exercise is more effective for improving cognition than strength exercise since strength exercise induced improvements in selective attention[7]. Tomporoski et al., found that submaximal aerobic exercise greatly increased cognitive function, but during continued bouts of extended, strenous exercise leading to dehydration both informative processing and memory cognition were compromised[8]. KalaPotharakos et al., compared the muscle strength of elderly individuals doing resistance exercise at different intensities (moderate and high) for 12 week and found that both groups improved in relation to the control group, although the group that trained at high intensity showed a significantly greater improvement in relation to the moderate-intensity group[9] Aerobically fit means that you need to moving large muscles such as leg muscles, trunk, and shoulder while breathing.Aerobic exercise was shown to increase heart rate levels and, to increase arousal levels[10] and activation of a specific cortical area[11]. These changes were suggested to be a mechanism that mediates the relationship between acute aerobic exercise and cognition [12]. As resistance exercise was shown to increase heart rate levels[13] as well as correlated with cognitive improvement[14] Alves et al. found that both acute aerobic exercise and resistance exercise improved speed processing and inhibition control in the Stroop test[15]. These exercise are hard enough to be challenging yet easy enough to be enjoyable. Resistance training given to elderly which increases power, reduce the difficulty performing in daily task, enhancing their energy expenditure, body composition, improving cognitive abilities and promotes participation in spontaneous physical activity. The present study reveals that the impact of the low intensity aerobic exercise and resistance training shows slight improvement in attention among geriatric population and concluding it with the pre and post test values of stroop test.

CONCLUSION

From the results the present study evaluated that individuals received both low intensity aerobic and resistance training shows improvement in attention by following the pre and posttest values of Stroop test.

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SP-19

EFFECT OF EXERCISE TRAINING ON OBESITY RELATED CARDIOVASCULAR RISK FACTORS IN ADOLESCENTS

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ABSTRACT

The increasing prevalence of childhood obesity and its related health problems is an important criteria which is not gaining much attention in these recent days. Obesity in adolescents should be considered as severe pathologic state, so maximal efforts should be made to improve prevention of obesity related cardiovascular risk factors in adolescents & therapy for treating them. This study is basically designed to focus on the effect of exercise on the prevention of it.Thus an experimental study was conducted in a total of 20 obese adolescent school going female children aged 12-18 years were selected from a private school in Chennai(Tamilnadu, India] a set of exercise protocol was given including aerobic training on a period of three months in a thrice weekly pattern of 20-30 minutes of moderate intensity. Both pre-test and post-test values of BMI, waist circumference, hip circumference, waist hip ratio and skin fold thicknesswere measured and calculated statistically. The results prove that there is statistical significance indicating the improvement in preventing the obesity related cardiovascular risk factors after the exercise training interventional program for a given period of 3months duration in obese adolescents.

KEY WORDS: ***Obesity, Adolescents, Cardiovascular risk factors, Exercise.***

INTRODUCTION

Childhood obesity is a major risk factor for many conditions including cardiovascular disorders. As per a survey published in THE HINDU Newspaper in June 2017, says India has the second highest number of obese children in the World after China, according to a study that has found that 14.4 million children in our Country have excess weight [1]. A study conducted among 24,842 school children in South India showed that the proportion of over-weight children increased from 4.94% of total students in 2003 to 6.57% in 2005 demonstrating the time trend of this rapidly growing epidemic[2].Now-a-days adolescents are more sedentary, more than they used to be, spending most of the time in front of the screen (TVs, smart phones, tablets) looking at a variety ofmedia(games, videos, movies, etc.). Too much screen time and not enough physical activity add to the problem of childhood obesity [3].This sedentary lifestyle has a greater impact on the various health problems in adolescents itself like diabetes, hypertension, cardiovascular diseases, which makes a path-way for them to be carried on to their adult life as they grow up [4,5].So adolescent obesity needs attention for preventing such health problems, relating to cardio vascular system. The importance of exercise training in preventing these health related problems is utmost an unnoticed area with very few researches in it.Although many studies have been conducted on preventing childhood obesity related problems in a multi-dimensional pattern of interventions including diet and nutrition, the sole impact of the effect of an exercise training programme in adolescents is the main focus of this study.
Another school based study in 2011 reported the prevalence of over-weight & obesity in 8 & 18 years old children, respectively was 14.4% & 2.8% by International Obesity Task Force (IOTF) cut-offs 14.5% & 4.8% by Centre of Disease Control (CDC) cut-offs &18.5% & 5.3% by WHO cut-offs.

Objective

To evaluate the effect of exercise training on preventing the obesity related cardiovascular risk factors in adolescents.

Study design
This study is a Quasi Experimental design.

Study methodology
This experimental study was conducted in a private school in Chennai, India. A sum of 20 obese adolescent school going female children aged 12 to 18 years were selected for the study.

Inclusion criteria
- Girls of age group 12-18 years
- Post puberty
- BMI more than 25

Exclusion criteria
Symptoms of illness like,
- ❖ Fever
- ❖ Cough
- ❖ Abdominal pain
- ❖ Any history of congenital heart disease
- ❖ Anxious
- ❖ Uncooperative

Procedure
A written consent was obtained from each participant's parent / guardian. All subjects were explained clearly about the procedures to be under taken by this study.The study was conducted during the period from Sep. to Nov. 2018. The following measurements were performed like BMI, waist circumference, hip circumference, waist hip ratio (WHR), skin fold thickness were calculated.

Body mass index
Age specific height, weight chart for girls was used to find the BMI measurements given according to WHO recommendations. A WHO classification of growth reference in 5 to 19 years of age for girls' gender was used to interpret the BMI measures of adolescent girls. The body weight of studied participants were measured by using balanced beam scale to an accuracy of +/- 0.1 Kg with the subject wearing minimum clothing, while body height was measured with the measuring rod attached to the balanced beam with the an accuracy of +/- 0.5 cm[6] .

Waist circumference
Waist circumference was recorded by measuring the smallest circumference between the ribs (last rib) and the iliac crest to the nearest 0.1 cm, when the participant was standing with the abdomen relaxed, at the end of normal expiration.

Hip circumference
Hip circumference was recorded by measuring the maximum circumference between iliac crest & the upper border of pubic symphysis.

Waist hip ratio
Waist hip ratio was calculated by dividing waist circumference by hip circumference.

Skin fold thickness evaluation
Skin fold thickness is one of the most widely used anthropometric methods for assessments of body fat using Vernier calliper. Excess fat as assessed using skin fold thickness is associated with abnormal concentrations of triglycerides, increased LDL Cholesterol, decreased HDL Cholesterol & insulin resistance. All these factors predict the increasing risk of hypertension, metabolic syndrome & cardio vascular diseases markedly. Each measurementsof triceps, subscapular & abdominal skin fold were taken. When a difference between first & second measurement exceeded 6 mm, a third measurement was taken.

Triceps skin Fold Thickness Evaluation

Triceps skin fold thickness was measured by lifting the arm parallel to the long axes of the body, mid-way on the back of the freely hanging right upper arm.

Subscapular skin Fold Thickness Evaluation

Subscapular skin Fold Thickness was measured by lifting the arm horizontally below the tip of right scapula.

Abdominal skin Fold Thickness Evaluation

Abdominal skin Fold Thickness was measured by lifting the abdominal skin fold diagonally mid-way between umbilicus & right anterior superior iliac spine.

After a period of 3 months of a given set of exercise protocol, all these measures were repeated and recorded accordingly[7].

Intervention

A set of exercise protocol including aerobic & endurance training like cycling and walkingwere given in an alternative day program, which was performed thrice weekly for a time period of 3 months duration[8] .Initially, a warm-up period of 5 minutes duration was given followed by breathing exercise, then exercise by cycling and walking on alternative days for a duration of 30 minutes in a moderate intense pace. Finally, a cool down period of 5 minutes stretching was given. Exact 30 minutes of work-out exercise training was given excluding the warm-up and cool down periods[9, 10].

STATISTICAL ANALYSIS

The anthropometric measurements like Body Mass Index, Waist Circumference, Hip Circumference, Waist Hip Ratio and skin fold thickness of triceps, abdominals and subscapular is muscles were taken both prior to intervention and after the interventional program of physiotherapy given. All the mean values were analysed statistically using the paired samples test, which showed significant (2 tailed) p values <0.05 which is appropriate.

DATA ANALYSIS

Table1

Comparison of pre-test and post-test anthropometric measurements

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	BMI.- PRE TEST	27.305	20	1.3744	.3073
	BMI.- POST TEST	26.875	20	1.4033	.3138
Pair 2	WC.- PRE TEST	85.45	20	2.937	.657
	WC.- POST TEST	84.870	20	2.8912	.6465
Pair 3	HC.- PRE TEST	78.285	20	1.0389	.2323
	HC.- POST TEST	77.735	20	1.1361	.2540
Pair 4	WHR.- PRE TEST	1.0917	20	.04055	.00907
	WHR.- POST TEST	1.0920	20	.04093	.00915

TT TBMI-Body Mass Index, WC-Waist circumference, HC-Hip circumference, WHR-Waist HipRatio.N=20

Table2

Characteristics of pretest and post-test measurements showing *p value <0.05

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	BMI.- PRE TEST - BMI.- POST TEST	.4300	.2364	.0529	.3194	.5406	8.134	19	.000
Pair 2	WC.- PRE TEST - WC.- POST TEST	.5750	.3041	.0680	.4327	.7173	8.455	19	.000
Pair 3	HC.- PRE TEST - HC.- POST TEST	.5500	.2911	.0651	.4138	.6862	8.450	19	.000
Pair 4	WHR.- PRE TEST - WHR.- POST TEST	-.00037	.00518	.00116	-.00279	.00206	-.317	19	.755

T test was used to com.

BMI-Body Mass Index, WC-Waist circumference, HC-Hip circumference, WHR-Waist Hip Ratio. Comparisons of pre and post test measurements take

Table3

Comparison of pretest and post testskin fold measurements

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	TRICEPS.- PRE TEST	17.510	20	5.3410	1.1943
	TRICEPS.- POST TEST	17.450	20	3.4994	.7825
Pair 2	SUBSCAPULARIS.- PRE TEST	9.760	20	1.7995	.4024
	SUBSCAPULARIS.- POST TEST	8.980	20	1.6606	.3713
Pair 3	ABDOMINAL.- PRE TEST	30.195	20	2.7538	.6158
	ABDOMINAL.- POST TEST	29.190	20	2.9388	.6571

Table4

Characteristics of pre test and post test skin fold measurements showing * pvalue <0.05

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	TRICEPS.- PRE TE TRICEPS.- POST T	.0600	4.1544	.9290	-1.8843	2.0043	.065	19	.949
Pair 2	SUBSCAPULARIS. PRE TEST - SUBSCAPULARIS. POST TEST	.7800	.3037	.0679	.6379	.9221	11.487	19	.000
Pair 3	ABDOMINAL.- PRE TEST - ABDOMINAL POST TEST	1.0050	.4322	.0966	.8027	1.2073	10.399	19	.000

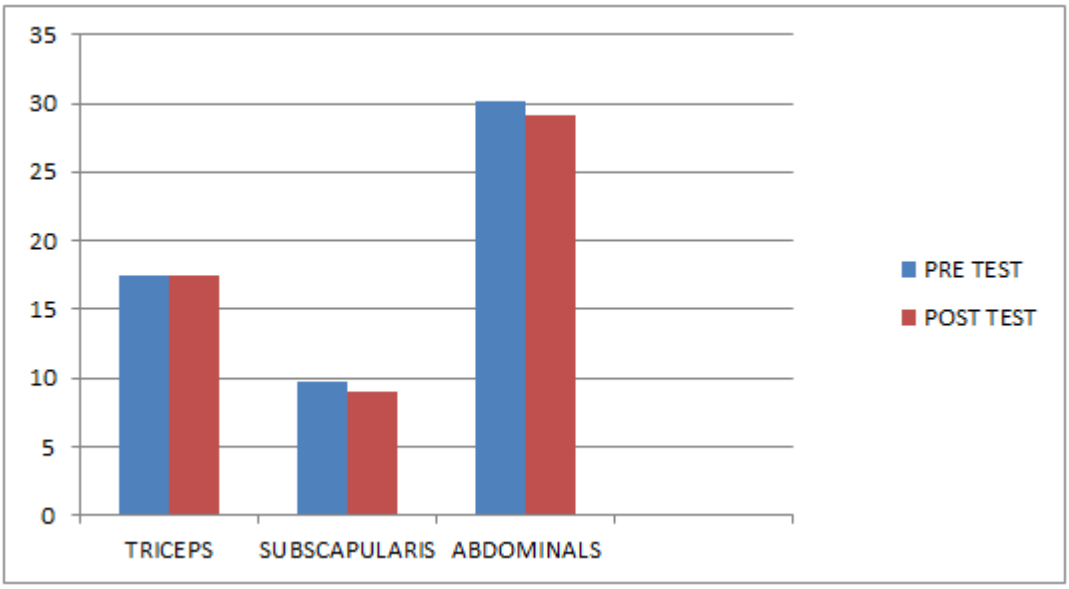
Figure 1

Anthropometric measurements taken pre and post-test.

Showing pre and post-test measurement differences of Body Mass Index, Waist circumference, Hip Circumference and Waist Hip Ratio which is significant the p value <0.05 by using paired sample t test.

Figure 2

Skinfold thickness measured pre and post-test.



Showing pre and post-test measurement differences of triceps, subscapular is and abdominal muscles which is significant the p value <0.05 by using paired samples test.

RESULTS

Among 20 obese subjects selected and studied as the outcome measures deducted BMI, WC, HC,WHR & skin fold thickness measurements were found to be statistically reduced representing the effect of exercise training protocol given for a duration of 3 months period, hence preventing the obesity related cardio vascular risk factors in adolescents.

DISCUSSION

The present study was aimed to evaluate the effect of exercise training on preventing the cardio vascular risk factors in adolescents using a set of given exercise protocol. A study reportin 1996 from the Surgeon General on "Physical Activity & Health", sponsored by the US Department of Health & Human Services,

the Centres for Disease Control & Prevention, the National Centre for Chronic Disease Prevention & Health Promotion & the President's Council on physical fitness and sports recommends that, "All people over the age of 2 years should accumulate at-least 30 minutes of endurance type physical activity, of at-least moderate intensity, on most preferably all days of the week[11].WHO Recommendations suggest environmental modifications, which facilitate everyday activities involving aerobic exercises such as walking & biking, rather than promoting specific bouts of vigorous activity. These studies suggest that aerobic exercise may reduce body fat in children and can do so independent of diet intervention and changes in dietary intake. A study published in clinical science journal gives the novel finding of the present proof-of- concept study was that 3 months of twice weekly exercise sessions reduced several known cardio vascular risk factors including FMD, VO2 max, insulin, fasting glucose, fat mass, more than that observed after a multi treatment strategy in obese adolescents. Also, a follow-up for 12 months confirmed that AIT improved / maintained these risk factors to a better degree than MTG[12]. A study published in Medicine & Science in Sports & Exercise in 1999, concludes that the research on effects of exercise or physical activity in obese children treatment protocols are encouraging and may be important for improving treatment outcome for obesity & comorbid condition[13]. Since, there is not enough research to evaluate the effects of exercise alone on preventing cardio vascular risk factors in obese adolescents, this study is focused on a particular exercise training protocol for preventing obesity related cardio vascular risk factors in adolescent. In this study, a set of exercise protocol involving cycling and walking is given for a time period of 3 months duration exclusive of diet restrictions, concentrating only on the calorie expenditure after exercise session, has shown a difference in anthropometric measurements and skin fold thickness measurements, which has been proved to have statistical significance also by paired samples test. At last, we have given a pathway for stepping in to a new road which is useful in preventing cardio vascular risk factors in obese adolescents.

CONCLUSION

This study concludes that there is a statistically significant difference in the pre &post-test measurements after intervention of given set of exercise training program, which shows that exercise training is effective in preventing obesity related cardio vascular risk factors[14]. Finally ,this study carries an important message to the society explaining why exercise training is beneficial for adolescents to develop a healthy lifestyle pattern through which both the adolescents and their parent will realise that exercise interventional training can be effective in improving the general health along with preventing the cardiovascular risk factors leading to overall wellbeing in adolescents.

LIMITATIONS

Further research needs to be done to examine the most effective strategies of intervention, prevention and treatment of obesity in both genders of children. Also studies have been requested to evaluate specific effects of different types of exercises on the key features of preventing obesity related cardio vascular risk factors. In particular, the long term relationship between aerobic exercise training and cardio vascular risk factor prevention in obese adolescents has yet to be determined in different groups [15, 16]. At-last a related suggestion for future research is an exploration of the optimal intensity, frequency, duration and mode of exercise training among obese children, including the impact on preventing the obesity related risk factors. This study involved a smallsample size and specifically involving female adolescents between 12-18 years of age only in that future study may involve a large sample size and both male and female subjects in it for a clear and better understanding for explorations in this related research topic.

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SP-20

EFFECTIVENESS OF MUSCLE ENERGY TECHNIQUE AND THERABAND RESISTANCE TRAINING IN FORWARD SHOULDER POSTURE AMONG THE COLLEGE STUDENTS

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ABSTRACT

Posture is the attitude assumed by the body, when it is in static or when it is dynamic. It is obtained as a result of the synchronize action of muscles working to maintain stability. Forward Shoulder posture is a forward position of the shoulders with protraction, upward rotation and anterior tilt of the scapula. It is due to the imbalance between the scapular muscles and the pectoralis minor. The forward shoulder posture can be identified by shoulder angle and To find out the effectiveness of muscle energy technique and theraband resistance training in forward shoulder posture among the college students. Experimental study design, Pre and Post type. The informed consent was taken from the participants. 30 participants are chosen based on the inclusion and exclusion criteria and they are assessed by photogrammetry method using Adobe Photoshop software then the subjects were divided into experimental group 15 and control group 15, the experimental group underwent the muscle energy technique and theraband resistance training program, the postural advice is given to control group. The statistical analysis shows the mean values, standard deviation, t value and P value of subjects with Forward shoulder posture showed a significant improvement only between pre and post-test of experimental group than the control group. The study concludes that the Experimental group (GROUP A) who underwent Muscle energy technique and theraband resistance training has shown statistically significant difference between pre and post-test in Experimental Group in Forward shoulder angle but there is no significant difference between Post-test comparison of Experimental group and Control group.

KEY WORDS: ***Forward shoulder posture, muscle energy technique, photogrammetry.***

INTRODUCTION

The shoulder girdle links the upper limb with axial skeleton it consists of the clavicle and scapula. The shoulder girdle composed of anteriorly the clavicle which attaches to the sternum then forms a sternoclavicular joint.[1] The clavicle and scapula are joined to each other forms acromioclavicular joint. The glenohumeral joint (shoulder joint) is ball and socket variety. It is a synovial joint. Thus, the shoulder joint is made by the articulation of the head of the humerus with the glenoid cavity of the scapula. The scapula is not directly connected to the endoskeleton but it is attached through muscle support forms scapulothoracic joint which is not considered as a true anatomical joint.[1,2.] The motions of shoulder girdle, acromioclavicular joint has three motions with correspondence to the clavicle, the first acromioclavicular joint motion is the internal and external rotation of scapula occurs in vertical axis with correspondence to clavicle with the acromioclavicular joint [4] ,the second acromioclavicular motion is the anterior tipping and posterior tipping of the scapula with correspondence to the clavicle around a coronal axis by the joint, Anterior tipping of the scapula results in the acromion tilting forward and inferior angle tilting backward [5] and the posterior tipping rolls the acromion backward and inferior angle forward. The third acromioclavicular motion is upward and downward motion of the scapula relation to the clavicle about an oblique Antero-Posterior axis perpendicular to the plane of the scapula. The upward rotation tilts the glenoid fossa upwards and downward rotation is in opposite motion.[7] The sternoclavicular joint has three rotary degrees of freedom such as elevation and depression of clavicle and anterior and posterior rotation of clavicle protraction and retraction

of clavicle. The motions of elevation and depression occur around the anteroposterior axis by the convex clavicular surface and a concave surface between the manubrium and first costal cartilage. [3] In elevation, the lateral clavicle turn round in upward direction; In depression, the lateral clavicle turn round in downward direction. In vertical axis of the sternoclavicular joint protraction and retraction of the clavicle occurs. With protraction, the lateral part of the clavicle moved anteriorly and with retraction, the lateral part of the clavicle moved posteriorly. The spin between the saddle-shaped surfaces of the medial clavicle and manubricostal facet results in anterior and posterior rotation of the clavicle. In resting position of the clavicle, it turns round in posterior direction which brings the inferior surface of the clavicle to face.[5,6,7] The scapulothoracic joint has upward and downward motion, elevation and depression of the scapula, protraction, and retraction, internal and external rotation and anterior and posterior tilting. The principle motion of the scapula is the upward rotation of the scapula happens during the active elevation of arms and during overhead activities. The scapular upward and downward rotation results from a combination of movements with sternoclavicular and acromioclavicular joint. The movement of Elevation and depression of scapula occurs during the shrugging of shoulder up and down in which the scapula moves upward and downward, these are the translatory movements that occur in resting position of the scapula. The protraction and retraction of the scapula are the translatory motions of the scapula, the scapula would move directly away from the vertebral column, retraction which the scapula towards the vertebral column. The internal and external rotation of the scapula on thorax should normally couple with protraction and retraction of the clavicle at the sternoclavicular joint. The anterior and posterior tilting of the scapula on thorax occurs acromio-clavicular joint, the anterior and posterior tilt of scapula can also couple with elevation and depression of clavicle at sternoclavicular joint.[8,9.] Thus any change in the scapulothoracic joint alters the biomechanics of other two joints, that change can be due to muscular imbalance as we know that scapulothoracic joint is directly not connected to axial skeleton its connected to the muscles any imbalance or weakness in scapular muscles especially the scapular stabilizers such as serratus anterior, rhomboids major and minor, upper, middle and lower trapezius and levator scapulae causes the abnormal position of the scapula results in abnormal motions of acromioclavicular joint and sternoclavicular joint.[1,2.] Thus scapula is the important linkage between the axial skeleton and the upper limb it also provides the stability for functional activity for the upper extremity. The abnormal scapular position causes the muscle imbalance results in the shoulder pathology such as impingement. Posture is the attitude assumed by the body, when it is in static or when it is dynamic. It is obtained as a result of the synchronize action of muscles working to maintain stability. Lengthening and shortening of muscle which makes the inappropriate joint movements and may cause pain. There is no single posture that can be comfortably maintained for long periods of time.[10] The prolonged posture will cause static loading of the muscles and joint tissues which can cause discomfort. During sleep there is a need for posture adjustments, the natural behavior of the human is to change posture often even during sleep there is a need for posture adjustments.[11] Forward Shoulder posture is a forward position of the shoulders with protraction, upward rotation and anterior tilt of the scapula. It is due to the imbalance between the muscles where the pectoralis minor is shortened and middle trapezius, lower trapezius and rhomboids major and rhomboids minor are lengthened. The forward position of the acromion from the 7th cervical spinous process indicates the forward shoulder posture and can be analyzed by the shoulder angle.[12] The malalignment or postures such as the forward shoulders are the serious risk factors interrelated with shoulder disorders. The deviation from the normal alignment causes the imbalance in the muscles and decreases the mechanical advantage of the muscles and abnormal stress on the musculoskeletal system. The alignment is considered as poor when the shoulder is protruded forward in relation to the trunk, this change associated with the change in the scapular position. A slumped posture for prolonged periods leads to an abnormal scapular position [13] Though the conventional physiotherapy for postural correction includes the stretching and strengthening programs.[14] This study was done to find the effectiveness of muscle energy technique and theraband resistance training for forward shoulder posture. The studies has been proved that muscle energy technique is more effective in increasing the pectoralis minor length among the collegiate swimmers which also reduces the risk of subacromial impingement and glenohumeral instability among the swimmers Theraband have various advantages rather than free weights such as resistance in multiple directions, provide variable resistance, provide constant tension and they are low-cost, easily portable and versatile. Theraband is the elastic band which is efficient for progressive resisted exercise.[15] It was used for more than 30 years. The available colors are yellow, red, green, blue, black and silver, as well as other colors such as tan and gold. The theraband resistance measured in both pounds and kilograms, the force depending upon the percentage of the band is elongated from its original

length is known as "force-elongation".[16] The muscle energy technique is a kind of soft tissue manipulation methods where the patient initiates directed and controlled isometric and/ or isotonic contractions designed to enhance musculoskeletal function and reduce pain. There are two forms of muscle energy technique they are post-isometric relaxation and reciprocal inhibition. The post-isometric relaxation is the term refers to the effect, the gradual reduction in muscle tone in an individual muscle or group of muscles, after the periods of isometric contraction has been performed. The reciprocal inhibition refers to the physiological response of the antagonist of a muscle which has been isometrically contracted, when a muscle is isometrically contracted its antagonist will be inhibited which is called reciprocal inhibition.[17] The modern muscle energy technique involves the use of patient's own muscular efforts in number of ways, usually in association with efforts of therapist such the therapist force should exactly match the effort of patient so that producing an isometric contraction allowing no movement occur producing as a result of physiological neurological response with combination of reciprocal inhibition of the antagonist of the muscle which is being contracted and post-isometric relaxation of the muscle which is being contracted. [17] The contraction can be produced in eccentric and concentric contraction, the therapist force should overcome the patient effort thus moving the joint in opposite direction in which the patient attempting to move it which is known as eccentric contraction or isolytic contraction. For concentric or isokinetic contraction the therapist should partially match the effort of the patient thus allowing, slightly retarding the patient effort produces the isokinetic contraction.[17.]

MATERIALS AND METHODS

Study design : Experimental design
Study type : Pre and Post type
Sampling method : convenient sampling
Sample size : 30 subjects
Study duration : 6 weeks
Study setting **:** SRM College of Physiotherapy, SRM Institute of Science and Technology.

Inclusion Criteria

Both genders (male and female).
Players with bilateral hip adductor tightness.
Groin pull or strain (grade-1, 2).
Professional Field hockey players. (Minimum-2 years).
Hip Adductor tightness according to the active hip abduction Range of motion.

Exclusion Criteria

Subjects with recent history of injuries to hip, knee, lumbar Vertebra and sacroiliac joint.
Groin pull or strain (grade 3).
Players with unilateral hip adductor tightness (pelvic hike or Drop).
Digital camera.
Therabands.
Reflective markers.

Materials Used

Digital camera.
Therabands.
Reflective markers.

Procedure

The participants are selected based on the inclusion and exclusion criteria. Procedure was clearly explained and informed consent was obtained. Both groups are assesd with photogrammetry method using Adobe photoshop® software.A total number of 30 subjects were selected by the convenient sampling method from SRM College of physiotherapy, kattankulathur, which was then divided into two groups Group A and Group B, The group A has trained with Muscle Energy Technique and Theraband Resistance training. The colour selection of the theraband was based on level of challenging, 5 repetitions of each exercise were asked to perform if it is easier the next grade of theraband was selected, if the level of challenging was more

difficult the next lower grade of theraband was selected. The group B is control group the postural advice is given to them. For group A Post isometric relaxation form of muscle energy technique was used for pectoralis minor, theraband resistance training was given to scapular muscles.

GROUP-A [Experimental Group]
Theraband exercises

Scapular Retraction
Participant position: In standing, shoulder abducted to 90 degrees, the elbows flexed to 90 degrees, and the forearms in pronation, the participants holds the end of the exercise band on both hands and the scapulae are retracted bilaterally by stretching the band. The participant's shoulders and elbows must maintain the original 90-degree position should return to the original starting position.

Shoulder External Rotation
Participant position: The arm is positioned at 90 degrees of shoulder abduction and 90 degrees of elbow flexion. The forearm in pronation holding the theraband another end of the theraband is fixed at waist level by other hand then the subject was asked to external rotation in this position. The Participant then performs a controlled return to the starting position.

Lower Trapezius Activation
Participant position: with flexion of shoulder to 90 degrees, and full extension of elbow, palmsfacing down then the shoulders are flexed to 180 degrees against the exercise band resistance performs a controlled return to the starting position after the 180 degrees of shoulder flexion The theraband is again fixed in front of the subject at the level of waist height for the beginning of this exercise.[18]

Weeks	Repetitions
WEEK 1	3×10
WEEK 2	3×15
WEEK 3	3×20*
WEEK 4	3×10
WEEK 5	3×15
WEEK 6	3×20

The training protocol for group A consist of three sets of ten repetitions with a interval of 1-2 minutes, *the colour of the theraband will be progressed to next level at the end of the third week if the subjects level of challenging was increased if not the same was continued for another 3 weeks, The protocol consist of single session per day, 3 days per week for 6 weeks. The muscle energy technique is kind of soft tissue manipulation methods where the patient initiates directed and controlled isometric and/ or isotonic contractions designed to enhance musculoskeletal function and reduce pain. This technique is commonly used to strengthen and lengthen muscles, reduce edema, improve circulation, and mobilize restricted articulations. The post-isometric relaxation is the term refers to the gradual reduction in muscle tone in an individual muscle or group of muscles, after the periods of isometric contraction has been performed. The participant position was in supine lying, horizontal abduction elbow in flexion to 90 degree the movement of horizontal abduction was taught to the participant before starting the technique, then the subject was asked to do the horizontal abduction hold in the position while the therapist gives resistance for shoulder horizontal abduction at the distal end of arm and at wrist simultaneously this results in isometric contraction of pectoralis minor. This isometric contraction was maintained for 5 seconds then the subject is asked to relax. This isometric contraction creates new range in horizontal abduction. Next isometric contraction was administrated as mentioned earlier from the new gained range. Three post isometric relaxation techniques were given for per session in a day likewise four days for a week for 6 weeks. For Group-A [Experimental group] the muscle energy technique for pectoralis minor and theraband resistance training was given.

For Group-B [Control group]
The Group B 15 participants were assembled in a room where the postural advices are demonstrated by the therapist when using laptop, smartphone and carrying backpacks. The postural advices such as when using laptops, the screen of the laptops should be at eye level, keyboards are at the elbow level, resting on arms of

the chair or the desk, back rest should support the lumbar curve of the spine, feet should be rested on the floor or on foot rest. When using backpacks, the straps in the backpacks should be equally adjusted on both sides, the backpacks should not to be carried on one side of the shoulder. The backpack should be above the waist level. When using smartphone the screen of the phone should be at eye level as it prevents the slouching of the neck, the elbows flexed to 90degree to keep the screen at eye level and the elbows should be rested and breaks should be taken for every 30minutes of smartphone usage.

Scapular retraction

Figure 1: ***Starting Position***

Figure 2: ***Ending Position***

External rotation

Figure 3: ***Starting Position***

Figure 4: ***Ending Position***

Lower trapezius activation

Figure 5: ***Starting position***

Figure 6: ***Ending position***

Muscle energy technique for pectoralis minor

Figure 7: ***Starting Position***

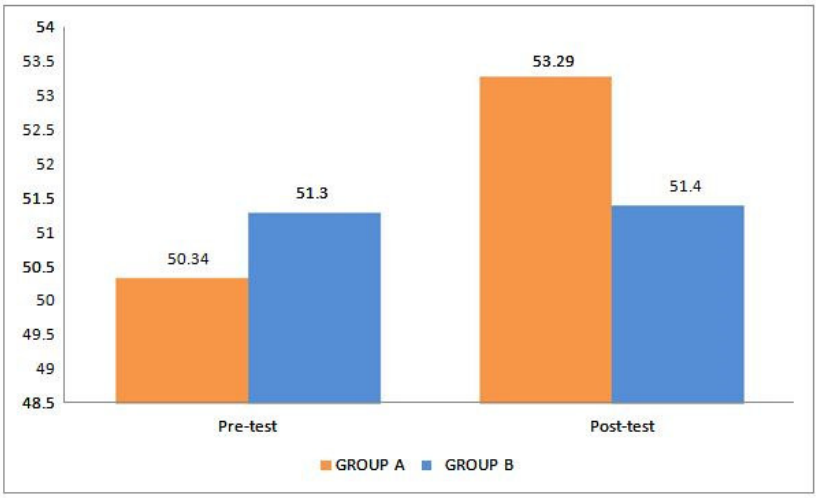
Figure 8: ***Ending Position***

Table 1

Comparison of Forward Shoulder Angle for Group A And Group B

		N	Mean	Std. Deviation	Sig.(2-tailed)	
					t	P value
GROUP A	Pre-test	15	50.34	1.37467		
	Post-test	15	53.29	2.12417	-8.430	.000
GROUP B	Pre-test	15	51.3	.67612		
	Post-test	15	51.4	.59426	-1.324	.207

Comparison of Mean Values of Forward Shoulder Angle for Group A and Group B



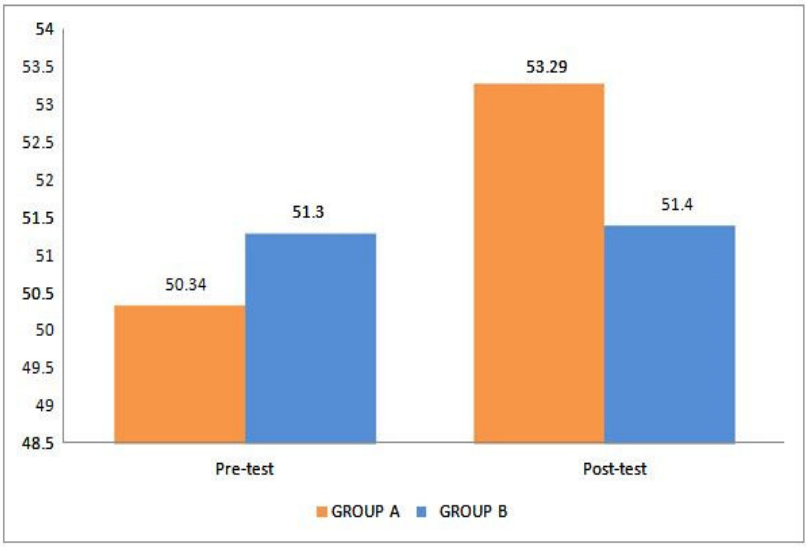
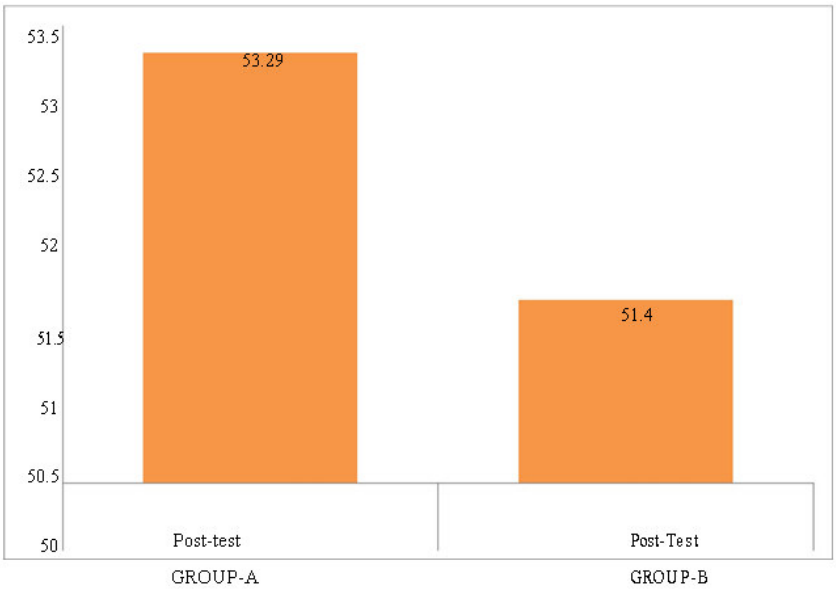


Table 2

Comparison of Post-Test Values of Forward Shoulder Angle for Group A And Group B

Variables		N	Mean	Std. Deviation	Std. Error	
					Mean	Sig. (2 tailed)
GROUP A	Post-test	15	53.29	2.12417		
					.003	.54846
GROUP B	Post-test	15	51.42	.59426		
					.005	.15344

Comparison of Post-Test Mean Values of Forward Shoulder Angle for Group A And Group B



CONCLUSION

The study concludes that the Experimental group (GROUP A) who underwent Muscle energy technique and theraband resistance training has shown statistically significant difference between pre and post-test in Experimental Group in Forward shoulder angle but there is no significant difference between Post-test comparison of Experimental group and Control group. Control group (GROUP B) who were given only postural correction advice has not shown any statistically significant improvement in Forward shoulder angle

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SP-21

A FEASIBILITY STUDY TO ASSESS THE EFFECT OF PACED BREATHING USING MOBILE APP ON DYSPNOEIC PATIENTS

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ABSTRACT

BACKGROUND: Dyspnoea is an uncomfortable abnormal awareness of breathing. It is the most common cause of respiratory limitation of activity in patients with pulmonary disease and leads them to seek medical intervention. AIM: This study aimed to assess whether a 15 minutes paced breathing reduces distress and breathlessness, among hospital Inpatients with dyspnoea. METHODOLOGY: Known case of chronic obstructive pulmonary disease patients of both gender with age between 50 to 65 years were selected based on inclusion and exclusion criteria (n=40).Participants completed a self-assessment survey, including the modified Borg scale for breathlessness, and hospital anxiety and depression scale. The patients were randomly divided into two groups. Group-A were allowed to perform paced breathing with the use of mobile application, Group-B were allowed to perform self-guided paced breathing. Paced breathing mobile application generates musical tones. The participants were instructed to use the paced breathing mobile application for 15 minutes. RESULTS: It showed mobile application based breathing significantly reduces the dyspnoeic level and hospital anxiety and depression level. CONCLUSION: Existing knowledge of mobile app usage on breathing intervention among dyspnoeic patients is very limited and this study will be helpful in the development of other mobile app related interventions. This study demonstrates that both the groups' shows reduction in dyspnea and HADS, but mobile application guided paced breathing shows statistically significant reduction in the hospital anxiety score, when compare to self guided paced breathing group.Hence mobile based paced breathing is feasible to be used by the dyspnoeic patients.

KEYWORDS: ***Dyspnoea, paced breathing, mobile application, anxiety and depression***

INTRODUCTION

Dyspnoea is the perception of uncomfortable breathing, it is a subjective symptom reported by patients. Mostly it is described as shortness of breath, inability to take a deep breath, or chest tightness and it may influenced by the state of mind of the patient so it can affect economic and social abilities.[1] Quantification of dyspnoea is important for judging the severity and prognosis of the underlying disease. The accessory muscles of respiration may be used, and supraclavicular and intercostal retractions may be seen during breathlessness. Cardiac, pulmonary, and neuromuscular examinations should receive particular attention in patients with dyspnea.[2] Patients with chronic obstructive pulmonary disease (COPD), generally present with a long history of cigarette smoking and gradually progressive dyspnoea over a number of years. Pulmonary function abnormalities frequently progress for years before clinical dyspnoea occurs.[3] some have day-to-day variation in their symptoms and also exacerbations during the winter months. A productive cough with purulent sputum during exacerbation is a frequent associated symptom. Pulmonary function tests are useful in the detection of obstructive pulmonary diseases. Simple spirometry test will reveal the vital capacity and forced expiratory volume in 1 second (FEV_1) for COPD patients[4] Arterial blood gas studies are generally performed in dyspnoeic patients, but it has limited usefulness in evaluating dyspnoea but it is most useful for quantifying the severity of gas exchange abnormalities in pulmonary disease patients.[5] Few studies states that there is no good correlation between the severity of hypoxemia and the severity of dyspnea.[6] The American Thoracic Society defines dyspnoea as "a subjective experience of breathing discomfort that

consists of qualitatively distinct sensations that vary in intensity", and recommends evaluating dyspnoea by assessing the intensity of the distinct sensations, the degree of distress involved, and its burden or impact on activities of daily living. A number of scales may be used to quantify the degree of shortness of breath.[7] It may be subjectively rated on a scale from 1 to 10 with descriptors associated with the number (The Modified Borg dyspnoea Scale).[7] Alternatively a scale such as the MRC breathlessness scale might be used – it suggests five grades of dyspnoea based on the circumstances in which it arises.[8] The modified Medical Research Council (mMRC) scale is the most commonly used validated scale to assess dyspnoea in daily living in chronic respiratory diseases[9, 10, 11] Most diseases associated with dyspnoea increases the work of breathing. This increased work of breathing may be due to an increase in elastic work (restrictive disease) or resistive work (obstructive disease).[6] Slow breathing exercises have been used for thousands of years in yoga and meditation practices, and have been successful in reducing sympathetic nerve activity and anxiety associated with breathlessness. Recently, electronic devices such as mobile application aimed to replicate self-guided breathing have been used. There have been mixed results regarding the efficacy of these devices. It is hypothesized that the act of reducing breathing rate is a factor contributing to physiological changes, and psychological metrics are important in determining the responses to breathing rate changes. Paced breathing is slow, smooth deep, diaphragmatic breathing. Some evidence shows that paced breathing may be effective in reducing breathlessness and, decrease anxiety and promote relaxation, it can be taught— for instance, from an app, podcast or Web-based program. The Hospital Anxiety and Depression Scale (HADS) was used to characterize the level of distress and widely used as screening measure for anxiety and depression consisting of 14 items, 7for anxiety and 7 for depression. Paced breathing is a free software application from The Health and Nutrition subcategory, part of the home and hobby category. Paced breathing (version 2.1) is an android app which gives visual, audio, and haptic (vibrate) breathing cues. It has features of adjustable session times (inhale, exhale), ramping times up down and custom breathing profiles. Paced breathing is breathing technique with being mindful of one's body and physical changes in body posture. It has been shown that three months of regular slow breathing practice reduces sympathetic nerve activity and increase parasympathetic nerve activity. The American Heart Association (AHA) issued a position statement providing moderate support to device-guided breathing while withholding support of yoga breathing (Brook, Appel et al. 2013). Hence this study aimed to determine the feasibility of mobile app based breathing and self-guided paced breathing result in reducing the breathlessness in dyspnoeic COPD patients.

MATERIAL AND METHODS

This study included 40 patients of both gender with age between 50 to 65 years diagnosed with COPD by respiratory physician from SRM Medical College Hospital and Research Center Kattankulathur Chennai.COPD patients (Modified medical research scaling grading 2-3) who are smart phone users with having normal hearing capacity,With controlled O2 therapy via nasal progs (<2L/min), were included. Participants were excluded if they had respiratory failure, had signs of confusion or dementia (mini mental state score <25/30), or diagnosed with pre-existing psychiatric disorder and BMI more than 40. Patients were recruited as soon as their condition was stable following admission from the causality ward. All eligible patients were given information regarding the study and informed written consent was obtained.

The patients were randomly allotted to Group A and Group B.:
Group A (experimental group) (n=20)-allowed to perform paced breathing with use of mobile app.
Group B (control group) (n=20) - allowed to perform self-guided paced breathing.

Participants in the mobile app-guided breathing group were instructed to synchronize their breathing to a series of tones administered through headphones. The participant were asked to breathe normally at their own rate for 10 minutes, then slow their breathing down for 15 minutes with the help of device-guiding effortlessly to the range less than 10 breath/min., then breathe normally again for 10 minutes. Participants in the self-guided condition were instructed to reduce their breathing to a rate slower than normal, but still maintain a breathing pattern that is comfortable to them in both rate and depth. Both the groups were instructed to close their eyes and place the hand over epigastric region to feel the diaphragmatic movement. Patients were instructed to take breath in through nose and breathe out through mouth; they were advised to focus their mind on their breathing pattern throughout the procedure. All studies occurred in the same room

with controlled temperature and humidity, dimmed lighting, and quiet conditions. Before intervention patients were asked to rate the intensity and unpleasantness of dyspnoea using a Modified Borg Dyspnoea scale ranging from 0(nothing at all) to 10(maximal) and asked to rate the anxiety and depression level using hospital anxiety and depression scale.

Figure:1 A COPD patient doing paced breathing using mobile application

DATA ANALYSIS

Table:1 ***Comparison of Pre and Post Test Value of Modified Borg Scale, Hospital Anxiety and Hospital Depression Score of Group-A***

GROUP-A	PRE&POST TEST	MEAN	N	STD .DEV	MEAN	T-VALUE	DF	SIG.(2 - TAILED)
MODIFIED BORG SCALE	PRE- TEST	6.80	20	1.28145	3.65	11.460	19	.000
	POST TEST	3.15	20	1.56525				
HOSPITAL ANXIETY SCORE	PRE-TEST	13.75	20	4.38748	5.00	6.542	19	.000
	POST TEST	8.75	20	3.53739				
HOSPITAL DEPRESSION SCORE	PRE TEST	15.60	20	2.87274	6.50	7.506	19	.000
	POST TEST	9.10	20	5.01472				

p<0.05 shows statistically significant results

Graph :1 ***Shows Pre Test and Post Test Mean Value of Group-A***

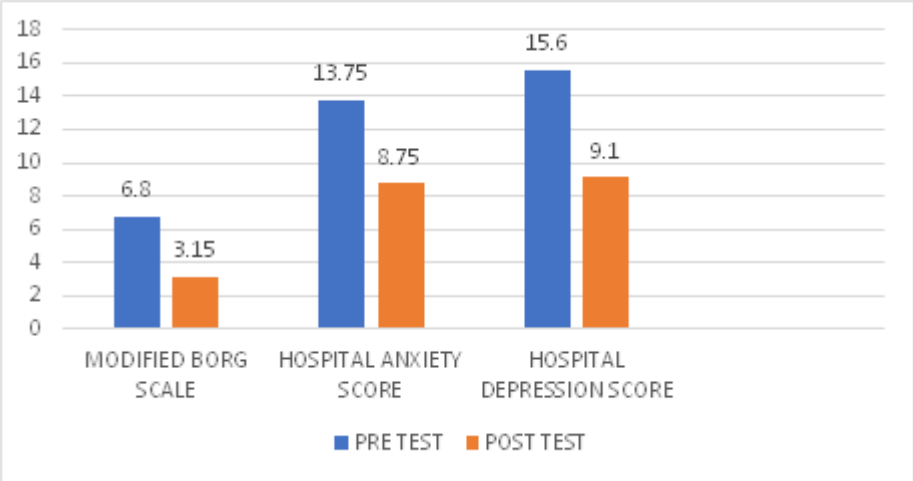


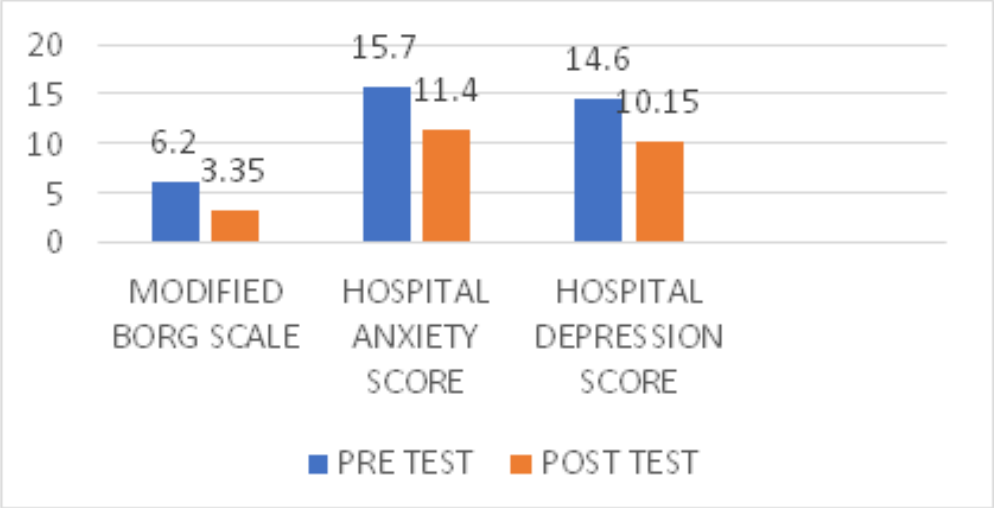
Table:2 ***Comparison of Pre and Post Test Value of Modified Borg Scale, Hospital Anxiety and Hospital Depression Score of Group-B***

GROUP-B	PRE&POST TEST	MEAN	N	STD. DEV	MEAN	T-VALUE	DF	SIG.(2 - TAILED)
MODIFIED BORG	PRE- TEST	6.20	20	1.23969	2.850	10.782	19	.000
	POST TEST	3.35	20	1.75544				

SCALE								
HOSPITAL ANXIETY SCORE	PRE-TEST	15.70	20	2.15455	4.30	11.831	19	.000
	POST TEST	11.40	20	2.62378				
HOSPITAL DEPRESSION SCORE	PRE TEST	14.60	20	2.85436	4.450	9.198	19	.000
	POST TEST	10.15	20	4.10744				

p<0.05 shows statistically significant results

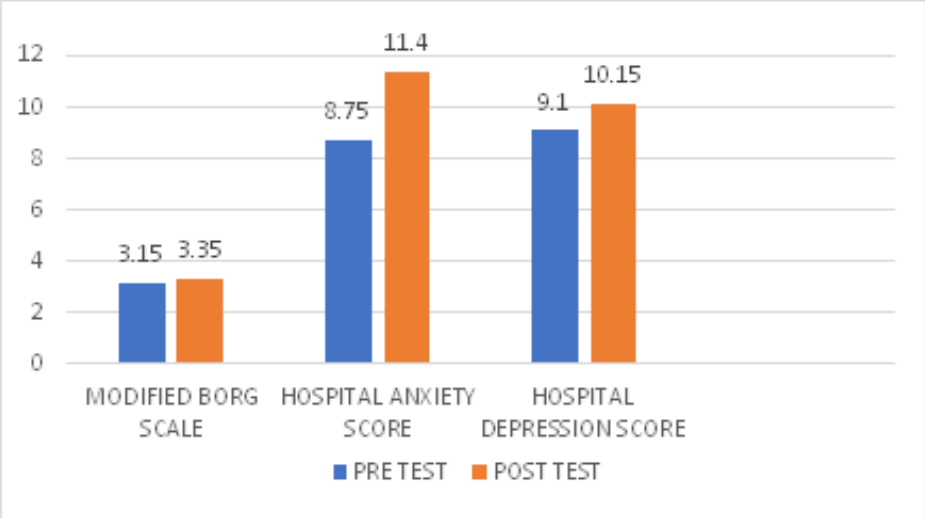
Graph:2 ***Shows Pre Test and Post Test Mean Value of Group-B***



GROUP-A &B	POST- TEST VALUE	MEAN	N	STD .DEV	T-VALUE	SIG.(2 - TAILED)
MODIFIED BORG SCALE	GROUP-A	3.15	20	1.56525	-.380	.706
	GROUP-B	3.35	20	1.75544		
HOSPITAL ANXIETY SCORE	GROUP-A	8.75	20	3.53739	-2.691	.011
	GROUP-B	11.4	20	2.62378		
HOSPITAL DEPRESSION SCORE	GROUP-A	9.10	20	5.01472	-.724	.473
	GROUP-B	10.15	20	4.10744		

Table:3 ***Comparison of Post Test Values of Modified Borg Scale, Hospital Anxiety and Hospital Depression Score of Group-A and Group-B***

Graph :3 ***Shows and Post Test Mean Value of Group-A and Group –B***



RESULTS

- Pre and post intervention data's were collected using Modified Borg Dyspnoea Scale and Hospital Anxiety and Depression Scale (HADS).
- Baseline data's and post intervention data's following 15 min of intervention was analysed using student t test using SPSS version 25. p value <0.05 is considered significant.

Table 1 and Graph 1 shows that Group A post-test mean value (3.15) of Modified Borg scale score has shown statistically significant reduction from pre-test mean value (6.80),post-test mean value (8.75) of hospital anxiety score has shown statistically significant reduction from pre-test mean value (13.75) and post-test mean value (9.10) of hospital depression score has shown statistically significant reduction from pre-test mean value (15.60).

Table 2 and Graph 2 shows that Group B post-test mean value (3.35) of Modified Borg scale score has shown statistically significant reduction from pre-test mean value (6.20),post-test mean value (11.40) of hospital anxiety score has shown statistically significant reduction from pre-test mean value (15.70) and post-test mean value (10.15) of hospital depression score has shown statistically significant reduction from pre-test mean value (14.60).

Table 3 and Graph 3 shows post-test value of Group-A and Group -B. It shows that although both groups shows difference in Modified Borg scale and Hospital depression score, but it was not statistically significant($p>0.05$). But there is a statistically significant results in hospital anxiety score ($p<0.05$) when compared the post-test value of Group-A and Group-B.

DISCUSSION

This study compared mobile app-guided paced breathing (n=20) and self-paced (n=20) breathing intervention in dyspnoeic individuals. The above results showed the statistically significant result among mobile app paced breathing technique on dyspnoea level and HADS score. These results showed that both breathing technique following a single intervention resulted in reduction of breathlessness, but mobile application based breathing showed significant difference in hospital anxiety score compared to self-paced breathing intervention. Disorders of emotion such as anxiety, contribute to higher dyspnoea rating as well the patients with chronic obstructive pulmonary disorder (COPD) reported greater dyspnoea during a resistive load breathing task (Giardino et al., 2010). Paced breathing and 'blow as you go' have been recommended for managing breathlessness in those with COPD (Booth et al 2011). This study found out the significant effect of mobile application based paced breathing technique on reduction of anxiety and depression among COPD patients. Asthmatics have benefited from slow paced breathing by improving autonomic control and attenuating vagal hyperactivity during asthma attacks (Lehrer et al., 2003, 2004).

CONCLUSION

This study concluded that paced breathing technique can be used for reliving the dyspnea and depression and anxiety among dyspnea patients but mobile application guided paced breathing statistically significant reduction in the hospital anxiety score, when compare to self guided paced breathing group.

This study also demonstrated the potential of device based breathing technique and its feasibility to assist the patients from reliving dyspnea, anxiety and depression

DECLARATION OF CONFLICTING INTEREST

The author(s) declared no conflicts of interest.

ACKNOWLEDGEMENT

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SP-22

A STUDY ON KNOWLEDGE, ATTITUDE AND PRACTICE OF POPULATION TOWARDS LIFESTYLE

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ABSTRACT

BACKGROUND: Hypertension and diabetes are the killer diseases worldwide and is a major risk factor for many other diseases like cardiovascular diseases, stroke, renal diseases and many others. Improving the ideas regarding prevention of hypertension will decrease the mortality and morbidity. This Study will indicate how many patients did not have appropriate ideas about the diseases like hypertension and diabetes. According to WHO 2008, the prevalence rate of hypertension was 32.5% and for diabetes was 14% and increasing each year with the population. OBJECTIVE: The aim of the study is to find out the knowledge, attitude and practice (KAP) about the illness in accordance with the demographic data of the hypertensive and diabetic patients. STUDY DESIGN: Non experimental design METHODOLOGY: The study is the observational study. According to the inclusion and exclusion criteria subjects were selected. Knowledge, Attitude and Practice(KAP) questionnaire are given to the subjects. RESULT: Result and conclusion will be revealed after the study has been completed.

KEYWORDS: ***Hypertension, diabetes, renal diseases, silent killer diseases.***

INTRODUCTION

In present scenario due to life style modification there is increased in the mortality rate because of certain diseases such as diabetes, hypertension, cardio vascular diseases etc. In these major silent killer diseases are diabetes and hypertension[1, 3]. . Still today people are not having correct knowledge about the diabetes and hypertension. So by increasing the health education about diabetes and hypertension will reduce the morbidity and mortality rate[4, 5]. Diabetes mellitus is a hyperglycemia, may be due to following etiology, environmental and genetically both will act combined [2]. According to WHO the prevalence rate of diabetes mellitus was 14%. Today global level prevalence rate of more than 138 million people are suffering with diabetes. Diabetes mellitus in Asian countries contain all sorts of sedentary life, practice, lack of knowledge and unsatisfactory attitude towards diabetes mellitus among diabetic patient [9, 10.] Largest numbers of diabetic patients are there in India. Lack of awareness and practice are some of the variable influencing the development and progression of diabetes mellitus complication. This study is done to prevent the diabetes by creating awareness among them.The emergence of diabetes and hypertension as a public health problem is strongly related to ageing, of the population, urbanization and the socioeconomic changes favoring sedentary life. Hypertension is a chronic condition which will play major role in etiology of stroke, coronary heart disease and other vascular complications [2]. According to survey report prevalence rate of hypertension vary from 17 to 21 per cent in all the states only with marginal differences in rural and urban [2]. Prevention and control are the two important factors to adopt lifelong healthy lifestyle. KAP questionnaire helps to improve their condition and also the control of complications.It just creates a awareness among the person having diabetes and hypertension. This survey is effective in providing a baseline for interventional program. This study aims to assess the baseline levels of KAP of the general population toward diabetes and hypertension.

Materials Required

Knowledge, Attitude and practice (KAP) Questionnaire.

METHODLOGY

The study was observational study. Duration of the study was 1 week. Inclusion criteria of the selected samples were age group between 40-60 years, both male and female, diabetic and hypertension patients.

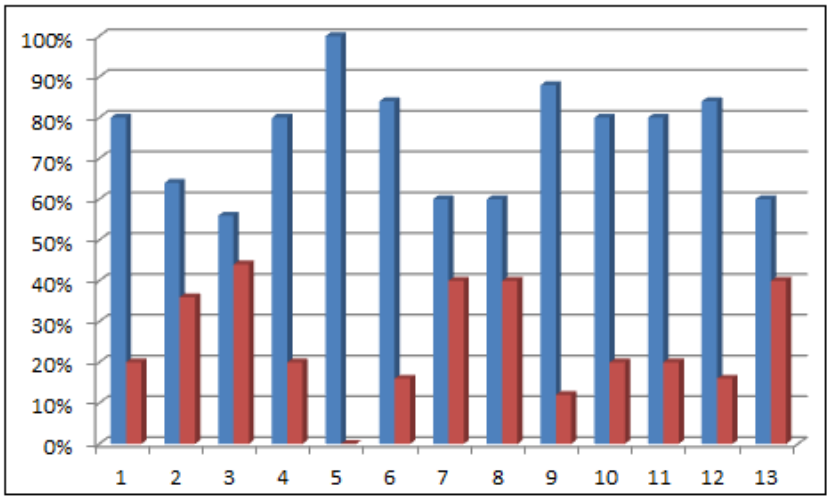
Study setting in and around Ambattur in Thiruvallur district. This was carried out on 25 diagnosed hypertensive patients and 25 diabetic patients. The subjects were explained about the study completely. Subjects who were added to the study in accordance with inclusion and exclusion criteria. The subjects who were willing to participate were included in the study. Each subject was given a Knowledge, Attitude and Practice questionnaire and was asked to answer to every respective question. The answers were obtained from the subjects and results were analyzed.

RESULTS

The questionnaire for diabetes and hypertension covers three area knowledge, attitude and practice. There are totally 14 questions in the KAP questionnaire for hypertension with 8 questions related to knowledge about hypertension and 5 questions to assess the attitude of the patient towards the disease. Similarly the questionnaire of diabetes had 8 questions. In this 4 attitude and 3 practice questionnaire

Graph 1

Response of participants to the knowledge, attitude and practice questions involved in assessment of KAP's of hypertension



1 – Do you know hypertension is a disease?
2 – Do you know the complications of hypertension?
3 - Do you have the normal level of blood pressure?
4 – Is the diet rich in salt causes hypertension?
5 – Do you smoke?
6 – Do you know the symptoms of hypertension?
7 – Is obesity associated with hypertension?
8 – Is exercise having beneficial role in hypertension?
9 – Should we reduce salt intake to prevent hypertension?
10 – Do you think regular checking of your blood pressure level is importance?
11 – Should we keep in touch with physician?
12 – Do you think regular medication is important in hypertension?
13 – Should we exercise regularly for a healthy life?

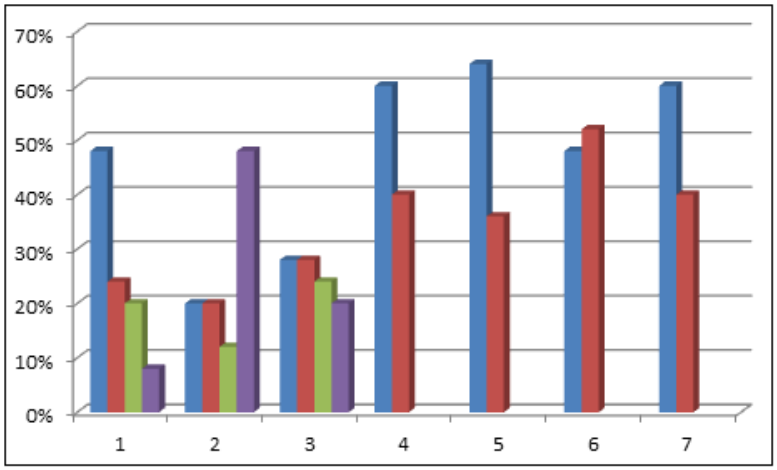
About 80% of the patient can explain hypertension is a disease.64% of them had knowledge about complication of hypertension. 56% of them are maintaining their normal blood pressure level. 80% of them know that diet rich in salt cause hypertension. 100% patients are non-smokers. 84% of them know the symptoms of hypertension. 60% of them known that obesity is the associated disease of hypertension. 60% of the patients know that exercise having beneficial role to reduce hypertension. 88% of patients reducing salt intake to prevent hypertension. 80% of the patients are thinking that regular check of blood pressure is important. 80% of the patients have an idea to keep in touch with the physician. 84% of the patients are having an mind set up that having medications regularly is important.60% of patients are doing exercise regularly. Rests of the 40% of patients are not doing any exercise.

Number of Hours Doing Exercise For Per Day

Time period	Percentage
10 minutes	4%
30 minutes	4%
1 hour	24%
1 hour 30 minutes	16%
2 hour	12%

Graph 2

Response of the participants to the knowledge, attitude and practice questions involved in the assessment of KAP'S of diabetes



1 – When was your blood pressure checked last?
2 - When did you have your last eye examination?
3 - When was your last urine exam done?
4 – Do you exercise regularly?
5 – Are you following a controlled and planned diet?
6 – Do you miss taking the doses of your diabetic medication?
7 – Are you aware of blood sugar level falling below the normal level when you are taking drugs?

About 48% of patients were checked their blood pressure 1 week ago, 24% of them 1 month ago, 20% of them 2 months ago and 8% of them 1 year ago. 20% of them examined their eye 1 month ago, 20% of them 6 months ago, 12% of them 1 year ago and 48% of them 2 years ago. 28% of them examined their urine 1 month ago, 28% of them 6months ago, 24% of them 1 year ago and 20% of them not at all done. 60% of them exercise regularly where as 40% is not doing any exercise. 64% of them following the controlled diet whereas the remaining 36% are not. 52% of them are not missing the doses where as 48% of them are skipping the doses. 60% of them were aware about their falling of blood sugar level below the normal while taking medication where as 40% of them were not aware about it.

DISCUSSION

This study shows that in attitude part of KAP questionnaire of hypertension that about 80% of the people have knowledge about the disease. majority of the people (80%)had a knowledge that hypertension is a disease.64% know about the complication of the disease.56% maintain a normal blood pressure.84% knows about the symptoms of hypertension.60%knows that obesity associated with hypertension. 60% knows the role of exercise in hypertension.88% has a knowledge that reduced salt intake should be maintained.80% has

a knowledge that regular checkup is important.80% knows that should keep in touch with physician and take regular medicine.60% of people do regular exercise. rest of the 20% of people doesn't know about the disease as they are poorly literate. Rests of them are not aware of this due to their carelessness and less importance to these conditions. This study reveals that even though 80% of them are aware of the disease hypertension, only 60% of them are doing exercise regularly and knowing the beneficial role of physical activity. Main role is to make them to understand that exercise play a important role equal to that of medications. Then in diabetes the KAP questionnaire shows that about 48% of them checked blood pressure by 1 week ago, 20% of them checked eye recently 1 month ago, 28% of them examined their urine by 1 month ago, 60% of them do exercise regularly, 64% of them are following controlled diet. 52% of them are not missing the medication doses.60% of them are aware of falling blood sugar level below the normal level while taking medications regularly. Here this study reveals that most of them are aware of their diet and medications but only 60% know the significance of exercise related to diabetes. In case of both diabetes and hypertension it can't be cure completely with medications. It can be reduced only by creating awareness about the beneficial role of physical activity in these conditions through group education and counseling to the patients. Thus physiotherapist play important role in educating the people about the benefits of exercise towards the diabetes and hypertension.

CONCLUSION

We conclude that encouraging the involvement of individual and counseling towards the significance of lifestyle modification is required for the patients who are suffering from diabetes and hypertension. Here in this counseling physiotherapist play a vital role to increase the understanding of the patients about physical activity influencing in the management of disease. Enhance their knowledge by making them to understand exercise have a equal role to medication to manage or to prevent a disease.

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SP-23

THE PREVALENCE OF FLATFOOT AMONG FOOTWEAR USERS AND AWARENESS ABOUT SELECTION OF FOOTWEAR

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ABSTRACT

BACKGROUND: - Pes-planus (flat foot) is one of the most common conditions observed in adult health practice. OBJECTIVE: - To find out the prevalence of flat foot in a population of 18 to 25 year old students and awareness about selection of foot wear. METHODOLOGY: - An observational study to find the prevalence of flatfoot among population between ages of 18 to 25 years of age using Foot Posture Index and Naviculardrop test as outcome measure. STUDY SETTING: Department of Health Science Colleges, SRM Institute of Science and Technology. PROCEDURE: 434 subjects were selected and the Foot Posture Index was assessed and the subjects who are positive in the FPI were further assessed for Navicular drop test and calculated for obtaining the results after the data analysis. RESULT AND CONCLUSION: - Prevalence of flat foot in a population of 18 to 25 years old physiotherapy students was 30.6% for all subject affected with bilateral flat foot. The mean Navicular drop test value was 11.94 for right foot and 11.97 for left foot. The pronation score (FPI) for flat foot subjects mean was 3.86 right foot and 3.73 for left foot. From our study we concluded that, prevalence of flat foot in a population of 18 to 25 years old physiotherapy students was 30.6%.

KEYWORDS: - ***Flat foot, Foot Posture Index, Navicular drop test, awareness.***

INTRODUCTION

The Foot supports the body weight and provide the leverage for running and walking. Arch is a segmental elevation of the Foot. The tarsal and metatarsal bones are arranged in longitudinal and transverse arches that add to weight bearing capabilities and resiliency of the Foot[11]. Pes planus is a condition in which there is a loss of medial longitudinal arch of the Foot. The entire Foot sole comes in to complete or near complete contact with the floor or ground surface during all weight bearing activities. The other names are Flat Foot, pes Plano valgus, fallen arches and Foot pronation. Flat Foot is classified as congenital and acquired. Acquired Flat Foot is secondary to disease, injury, due to unusual prolonged stress or due to aging process. Flat Foot will occur when there is any abnormality in supporting structure of medial longitudinal arch lie bone, ligament and tendon. Flat Foot can lead to heel pain, bunions, hammer toes, shin splints and even Knee, hip or back pain[14]. Adults with acquired flat foot may develop severe Arthritis in the foot and ankle. Many research experts have tried to determine the prevalence of Flat Foot at different times and from different parts of the world and it varies in different regions of the world. Also, it may vary in one society from time to time.[9, 17] Pes planus ("Flat Foot') is one of the most common conditions observed in adult health practice. Adult Flat Foot may present as an incidental finding or as asymptomatic condition with clinical consequences ranging from mild limitations to severe disability and pain causing major life impediments. The Acquired Flat Foot is often a complex disorder with adversity of symptoms and various degrees of deformity. Pathology and symptoms are caused by structural loading changes along the medial foot and plantar arch, as well as by collapse through the mid foot and impingement along the lateral column and rear foot. Muscles in the leg and foot tend to fatigue and cramp because of overuse. A six-item criterion reference tool (the Foot Posture Index or FPI) was developed in response to a requirement for a quick, easy and reliable method for measuring Foot position in a variety of clinical settings. The FPI consists of six validated, criterion-based observations of the rear foot and forefoot of a subject standing in a relaxed position. Height of navicular bone is important in maintaining the integrity of medial longitudinal arch as it is situated at the medial side of the tarsus between talus behind and cuneiform bones in front. Navicular drop is defined as the change in height of the navicular bone when the foot moves from subtalar neutral non

weight bearing to relaxed weight bearing stance have been proved to be valid and reliable. Till date majority of studies on prevalence of flat foot are conducted on Children below 10 years of on the adults, but minimal literature is available with studies on 18-25 years age group. Navicular drop test and FPI are the common method for assessing prevalence of Flat Foot. Hence this study was undertaken to find out Prevalence of Flat Foot in 18 -25 years old students and to find out co relation of unilateral and bilateral Flat Foot among male and females. In adults, "The Flexible Flat Foot may be regarded as the normal contour of a strong and stable foot, rather than the result of weakness in Foot structure or weakness of the muscles which motivate the Foot" (Harris and Beath, 1948 Journal of Bone and Joint Surgery, 30A 116-140). The authors went on to state that a Flexible Flat Foot, in adults, is of little consequence as a cause of disability.

Aim and objective of the study

Till date majority of studies on prevalence of Flat Foot are conducted on children below 10 years of age on the adults, but minimal literature is available with studies on 18-25 years age group. Hence this study was undertaken to find out Prevalence of Flat Foot in 18 -25 years old students and to find out of Unilateral and Bilateral Flat Foot among male and females which was least documented in researches so far .Gender specific and weight specific studies over Flat Foot are prevalent but they mostly had targeted the age groups below ten years of age .Body Mass Index and Flat Foot were associated in lot of studies but contradictory results prevails. Further more very few studies exist to analyse the awareness of Foot wear among Individuals and so this study is done to find the prevalence of Flexible Flat Foot and awareness of Foot wear among normal Foot wear Users.

Methodology and procedure

The Participants were explained about the procedure and the awareness of the study. The informed consent was given to the Participants who are willing to participate in the study according to inclusion criteria. Random Sampling method is used. Initially, Demographic Data the Participants

Name, Age, Gender, BMI, circumference of metatarsophalangeal Joint was assessed. After that Participants were assessed for Foot Posture Index and the Participants with Flat Foot is assessed for Navicular Drop Test.

Assessment of Foot Posture Index

FPI is made only by visual observations.

	Frequency	Percentage	Valid percentage	Cumulative percentage
Flexible	133	30.6	30.6	30.6
Neutral	301	69.4	69.4	100.0
Total	434	100.0	100.0	

FPI was assessed using following six criteria

1. Talar Head palpation
2. Supra and infra lateral malleolar curvature
3. Calcaneal frontal plane position
4. Prominence in the region of the talonavicular joint
5. Congruence of the medial longitudinal arch
6. Abduction/adduction of the forefoot on the rear foot.

The Participants should stand in their relaxed stance position with double limb support. The Participants was instructed to stand still, with their arms by the side and looking straight ahead. The Anterior, Posterior and Medial aspects of the Foot were assessed .The scoring criteria determines the pronated Foot Posture. The Participants with the presence Flat Foot is assessed with Navicular Drop Test

Measurement of navicular height

The Participant is made to sit in a chair with knees Flexed to 90 degrees and Ankle Joint in a Neutral position. The most prominent position in the Navicular Tubercle is marked with a pen. When the subtalar neutral position is maintained, the index card is placed on the inner aspect of the hind Foot. The card is

placed from floor in a vertical position passing the navicular Bone. Level of most prominent point of tubercle is marked on the card. Then the Paticipant is asked to stand, in standing position, by transferring equal weight on both limbs. The prominent position of Navicular Tubercle is again marked. Finally, the difference between original height of navicular tubercle in sitting position and in weight bearing position will be assessed by using Inch tape.

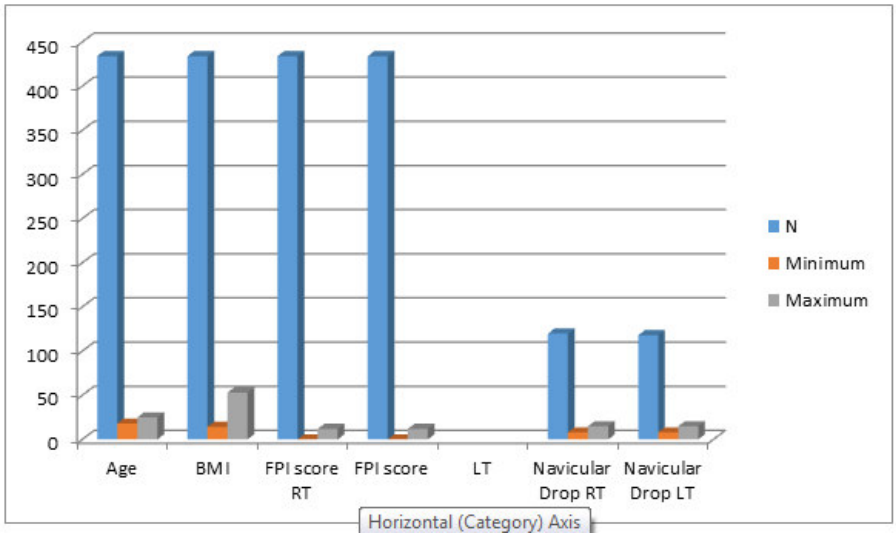
DATA ANALYSIS

Table-1

Age and scores of body mass index, foot posture index and Navicular drop test among individuals presented with flat foot.

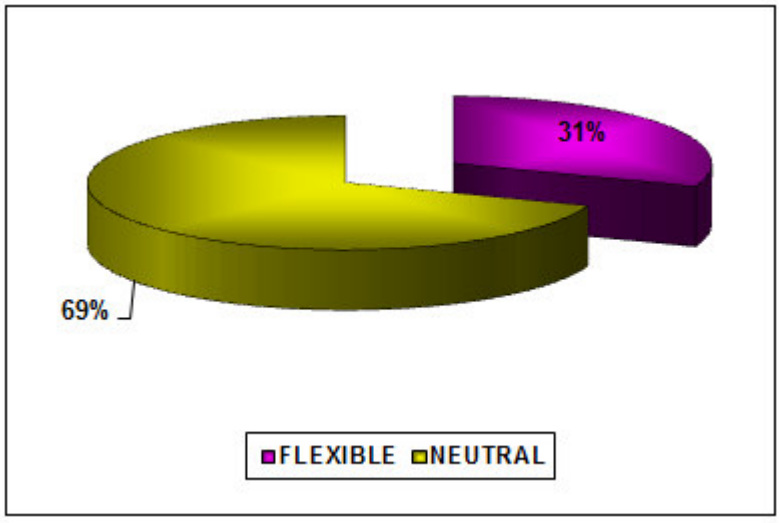
	N	Minimum	Maximum	Mean	Std. Deviation
Age	434	18	25	19.29	1.619
BMI	434	14.20	53.10	21.6394	3.90157
FPI score Right	434	0	12	3.86	3.466
FPI score Left	434	0	12	3.73	3.395
Navicular Drop Right	120	8	15	11.94	1.546
Navicular Drop Left	118	8	15	11.97	1.476

Graph-1



Graph-2

The prevalence of flexible flat foot among normal individuals using foot wear.



Able 4

Table-3

The prevalence of unilateral and bilateral flat foot involvement among individuals using normal foot wear.

	Frequency	Percentage	Valid percentage	Cumulative percentage
Unilateral right	16	3.7	12.0	12.0
Unilateral left	13	3.0	9.8	21.8
Bilateral	104	24.0	78.2	100.0
Total	133	30.6	100.0	
Missing system	301	69.4		
Total	434	100.0		

Graph -3

The prevalence of unilateral and bilateral flat foot involvement among Individuals using normal foot wear.

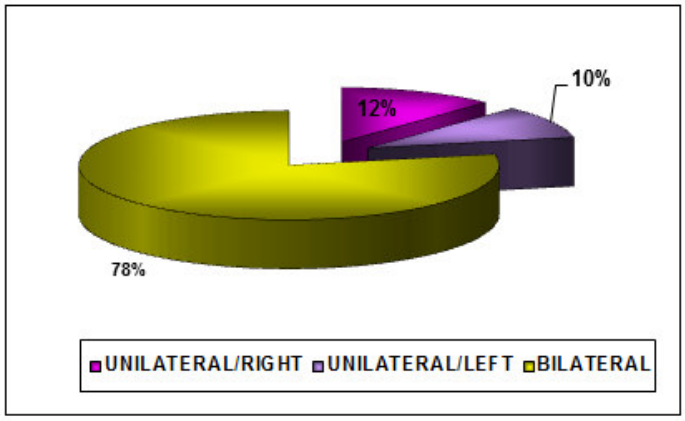


Table 4

Prevalence of flexible flat foot among normal individuals using foot wear based on gender

	Frequency	Percentage	Valid Percentange	Cumulative Percentage
MALE	208	47.9	47.9	47.9
FEMALE	226	52	52.1	100.0
TOTAL	434	100.0	100.0	

Graph 4

The prevalence of flat foot among normal individuals using footwear based on gender

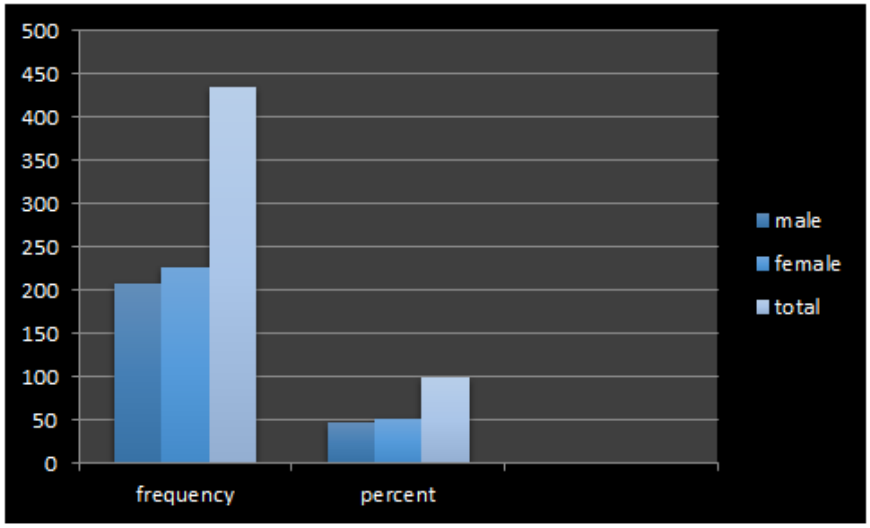


Table 5

Prevalence of flat foot based on body mass index among normal individuals using foot wear

BMI	NORMAL	PRONATED	TOTAL
UNDER WEIGHT	16.4%	3.5%	19.8%
NORMAL	44%	18.2%	62.2%
OVER WEIGHT	10.8%	5.5%	16.4%
OBESE	7%	9%	1.6%
TOTAL	71.9%	28.1%	100.0%

Graph 5

Prevalence of flat foot based on body mass index among normal individuals using foot wear

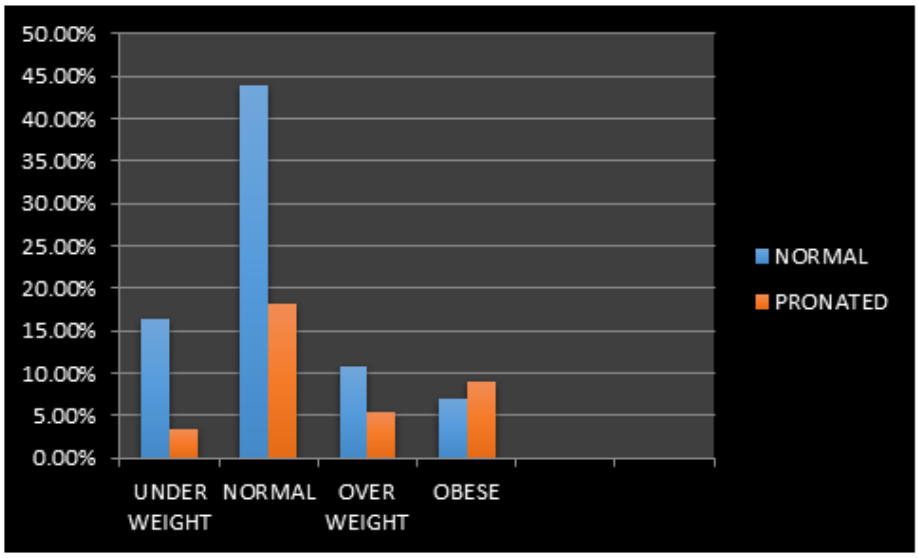


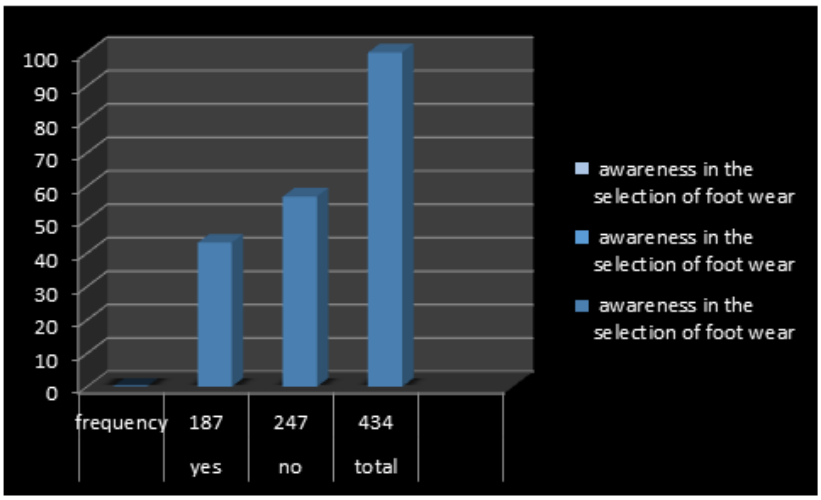
Table 6

The prevalence of awareness in the selection of foot wears in normal individuals using foot wear

	Frequency	Percent	Valid percent	Cumulative Percent
Yes	187	43.1	43.1	43.1
No	247	56.9	56.9	100.0
Total	434	100.0	100.0	

Graph 6

The prevalence of awareness in the selection of foot wears in normal individuals using foot wear



RESULTS

Table 1 and Graph 1 shows that that minimum age limit is 18years and maximum age limit 25 years. The mean age is 19.29 and the Body Mass Index varies from 14.20 and 53.10and the mean is 21.6394 and the mean of Foot Posture Index score on right foot is 3.86 and on left Foot is 3.73 and the mean of Navicular Drop Test on right Foot is 11.94 and for the left Foot is 11.97.Table 2 and Graph 2 shows the prevalence of flexible flat foot is 30.6% among the total subject of 434 normal individuals Table and Graph 3 Infers the prevalence of Unilateral Right Flat Foot is 37%, Unilateral Left Flat Foot is 3.0%, bilateral is 24% among the total subject of 434 normal individuals. Table 4 and Graph 4 infers the prevalence of Flat Foot among males is 47.9% and females is about 52.1%Table 5 and Graph 5 shows that the prevalence of Flat Foot among underweight students were 3.5%, among normal students were 18.2%, among overweight students were 5.5%, among obese students were 9%.Table 6 and Graph 6 shows that the prevalence of awareness in the selection of foot wear among normal individuals using foot wear is about 43.1%

DISCUSSION

This study focuses on the prevalence of Flat Foot among normal foot wear users and awareness about selection of Foot. The normal human Foot typically characterized as having three arches: medial and lateral longitudinal arches and a transverse arch. Foot has two functions to perform static and dynamic functions, in standing; it performs static function by forming a stable weight bearing support to the body. During walking, it functions as an efficient lever to propel the body weight forward. Arches of Foot are held together by the strong ligaments especially the spring ligament, long plantar ligament, short plantar ligament, interosseous ligaments and plantar aponeurosis. Of the muscles, tibialis anterior, tibialis posterior and peroneus longus help in integrity and maintenance of the arches and help in efficient posture[8] .Tendon of the tibialis posterior, on its way to its final insertion in the internal cuneiform and metatarsals, attaches to it, instead of to the under surface of the scaphoid tubercle. This relationship is the cause of its influence on Flat Foot. Flat Foot is a condition in which there is a loss of medial longitudinal arch of the foot, the entire sole of the Foot comes in to complete or near complete contact with the floor. Adult Flat Foot is defined as a foot condition that persists or develops after skeletal maturity and is characterized by partial or complete loss (collapse) of the medial longitudinal arch. So far, so many studies had assessed the Flat Foot, but only a few studies had documented the awareness in the selection of foot wear, Gender and weight specific Prevalence of Flat Foot among indivuals with Normal Foot wear. This study covered the age group of 18-25 years, both male and females were included in this study. Foot Posture Index and Navicular Drop Test are the two assessment tools used for evaluation of Flat Foot among normal Foot wear users. This study specifically found the prevalence of Flexible Flat Foot which was about 30.6% among 434 individuals in the age group between 18-25 years. The Prevalence of the study is higher than a study done by Teja shree Bhoir, Deepak Anap, Abhijit Diwate concluded that prevalence of Flat Foot in a population of 18 to 25 years old physiotherapy students was 11.25% and all the subjects were with bilateral Flat Foot. The results of this study was supported by FeridunÇilli, M.D.,p test. Özcan Pehlivan, M.D., Kenan Keklikçi, M.D.,et who reported that Flat Foot is usually present in children younger than 8-10 years old and differs among age groups.To detail on, this study has also documented the prevalence of Flexible Flat Foot according to unilateral and bilateral involvement. Bilateral Flexible Flat Foot was found to be 24% prevalent among 434 individuals with normal Foot wear users whereas unilateral Flat Foot involvement prevalence is about 40% and among the unilateral involvement right Foot tend to have more prevalence of Flexible Flat Foot than the left Foot which is about 3.7%.This can explain the unilateral Flat Foot involvement are more prevalent than the bilateral involvement. The reason might be as most of the human beings stand by shifting most of their weight in single leg. This study further open up the prevalence of right foot involvement 3.7% than the left 3% among unilateral Flexible Flat Foot individuals. So to sum up there was a 30.6% Prevalence of Flexible Flat Foot and 24% were found to have bilateral involvement and right foot have 3.7% of prevalence, while Left foot was only found to have 2% of the prevalence. On documenting the Gender specific Flatfoot Prevalence the study has documented the prevalence of Flat Foot among males is 47.9% and females is about 52.1% among individuals using Normal Foot wear. In this study it is concluded that females have more prevalence of Flat Foot compared to males the reason might be that among the sample collected there is a increased number of females than males which could have also lead to an increased prevalence of Flat foot among Female population than Male Population. Also in current population Females also tend to have the above muscle shortness as that of males. When the Prevalence of Flat foot was specifically found in

accordance with the weight of the individuals, the results showed a prevalence of Flat Foot among underweight students which was about 3.5%, High prevalence of flat foot was found 18.2% among normal weight students and among overweight students the prevalence of Flat Foot was about 5.5%, and among obese students the prevalence of Flat Foot was found to be 9%. The results are in contradictory with Aymelex cetin, sedat sevil, leyla karaoglu (2011) who concluded that prevalence of Flat Foot was lower among children living in rural areas and children with low Body Mass Index value. Overweight had Flat Foot compared to underweight children. It has been suggested that the Flat feet of obese students may be caused by a collapse of the medial longitudinal arch due to excessive loading of the feet as a result of continually bearing additional body mass. Such a structural collapse can develop in to a potentially disabling problem in later life, as proper mechanics of the longitudinal arch are critical to normal foot function. Although this notion of a longitudinal arch collapse is purely speculative, it highlights the need to understand the cause of Flat Feet in obese college students. When foot arch is reduced, complications are there may be a significant pain experienced in the inside portion of the ankle or lower leg. It can lead to the development of shin splints, a severe inflammation of the shin bone then, leads to bunions, deformation of big toe. With the Flat Feet, stress on the ankle and the back portion of the heel leading to tendinitis. This study emphasize a reduction of weight, proper mechanism of standing equal distribution of both legs should be educated among the young population to prevent the complication that might occur due to the prevalence of Flat Foot. The other component of study was awareness of selection of foot wear. Udhaya Bhaskara Rao and Benjamin Joseph suggested that the preponderance of Flat Foot also varied with the type of Foot wear. The children who wear closed shoes are most evident with associated ligament laxity. Which is also an important aspect to be taken care to prevent Foot problems? The Foot wear must provide adequate stability and support. The studies suggest that when a person wears shoes for most of their life the shape and function of their feet is altered. Shoes provide a rigid, unchanging platform for the foot. Most shoes are designed with bullet-shaped toebox, or a tapering of the width of the shoe towards the toes. This shape prevents the toes from spreading apart. Built-in arch supports are designed to control motion of the foot or hold the foot in a fixed position. This can potentially alter the activity of foot's own arch supporting muscles. Elevated heel cause ankle stiffness can be a contributing factor for flat feet and over pronation. Thus this study states that there was a prevalence of about 30.6% of Flat Foot. The prevalence of awareness in the selection of Foot wear is about 43.1%.

Limitations

Only 18-25 age group college students were included in this study. Only foot posture index and navicular drop test were used. Only flexible flat foot was considered for the study

Recommendations

Other methods can also be used along with foot posture index and navicular drop test method Congenital flat foot can be considered in future studies the prevalence of flat foot can be compared with congenital flat foot and acquired flat foot the prevalence of flat foot can be compared with rural and urban college going students

CONCLUSION

This study concludes that thus this study states that there was a prevalence of about 30.6% of Flat Foot. The prevalence of awareness in the selection of Foot wear is about 43.1

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SP-24

ASSOCIATION OF PULMONARY FUNCTION TEST AND PELVIC TILT POSITIONS IN OBESE INDIVIDUALS

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ABSTRACT

BACKGROUND: Obesity and poor respiratory function are always interrelated and may have impaired lung function. The general function of lung is affected by height, weight and age. The thoracic vertebra is influenced by hip and pelvis bone leading to change in kyphosis of the thoracic region. OBJECTIVE: To investigate the association of Pulmonary Function Test (PFT) and pelvic tilt positions in obese individuals. METHODOLOGY: Study design is observational. 50 male subjects with age group between 18-30 years with BMI $\leq$ 30 (Asian criteria) and WHR <0.90. The Pulmonary Function Test values were taken in different pelvic tilts such as anterior, neutral and posterior tilt position with a rest period of 1 minute after each session and a 5 min was break between each position. OUTCOME MEASURES: Forced Vital Capacity (FVC), Forced Expiratory Volume in 1 sec (FEV_1), Forced Expiratory Volume in 1 second / Forced Vital Capacity (FEV_1/FVC), Peak Expiratory Flow Rate (PEFR), Inspiratory Capacity (IC). RESULTS: This study showed that the mean values of FVC, FEV_1, FEV_1/FVC, PEFR and IC obtained from anterior, neutral and posterior pelvic tilt positions were almost similar and there was no statistical significance ($p>0.05$). CONCLUSION: The study concludes that there is no association between pulmonary function test and pelvic tilt positions in obese individuals.

KEYWORDS: ***Pulmonary Function Test, Pelvic Tilt Position, Forced Expiratory Volume in 1 second/Forced Vital Capacity, Peak Expiratory Flow Rate, Inspiratory Capacity.***

INTRODUCTION

Obesity is becoming a global epidemic[1]. Obesity is an excess accumulation of body fat usually 20% or more over an individual's ideal body weight. It is related to the risk of illness, disability, and death. Obese can also be defined as when the Body Mass Index (BMI) is 30 or above. Abdominal obesity is a risk factor for cardiovascular disease normally[2]. The optimal Body Mass Index for the adult age 18 to 85 years is 23-25 for whites and 23-30 for blacks[3].The genetic factor plays an important role in the development of obesity, it is noted that epidemic of obesity is occurring on the genetic background[4]. More than 41 genome sites serve as a link to the development of obesity under suitable environment according to recent research[5].The assessment of gene-environment obesity relation is important because the extensiveness of obesity, mainly in children is likely to increase in coming years. Obesity is associated with several disorders such as cardiovascular disease (CVD), type 2 diabetes, hypertension, certain cancer, and sleep apnea. Obesity is an independent risk factor for Cardiovascular disease and its risk are well documented in obese children[6]. Obesity is associated with high risk of morbidity and mortality and also it is related to reduce life expectancy[7]. According to World Health Organisation (WHO), World Health Statistics report globally one in six adult is obese and nearly 2.8 million people die each year due to overweight or obesity and an estimation of nearly 2.3% of global. Disability Adjusted Life Years (DALY) are mainly caused by obesity. Obesity is considered as a disease in its own right because of its increased risk of mortality and morbidity. The presence of adipose tissue around the rib cage and abdomen and in the visceral cavity compresses the chest wall and reduces functional residual capacity among obese individual[8]. The symmetrical operation of the structures of the lung determines the adequate pulmonary function. The limited diaphragm movement and rib movement is mainly due to the structural changes in the thoracic-abdominal region among obese individuals. In obese individuals, the adipocyte acts as an endocrine organ and pancreas which releases a large number of cytokines and bioactive materials, thus causing a pro-inflammatory state and it is associated with hypo development of lungs, airway responsiveness, high risk of asthma and other modifications of this

diseases[9]. Pulmonary function test is an important measure in the examination and observing the lung pathology and efficiency of the lung functioning. It provides all the important information regarding the large and small airways, lung parenchyma and the size and integrity of the lung capillary bed. The most accurate technique for determining lung volumes are spirometry and plethysmography. Spirometry is a tool which is used to measure lung function and is the measure of volume against time which is used most frequently[10]. During normal respiration, the contraction of the diaphragm, pushing the abdominal contents forward and downwards, and simultaneously, the ribs are pulled upward and forward because of the contraction of the external intercostal muscles[11]. In the obese population, this process is inhibited, because of the increased fat which surrounds the thorax and the abdominal region which restricts the breathing muscles. The increase in the deposit of fat in the abdominal region causes an increase in resistance to diaphragmatic contraction hampering the ventilator mechanism. The body weight, height, age, and gender have an effect on the general function of the lungs and there is a direct association between physical built and respiratory functions in the mammals[12]. The location of the pelvis and the hip bones influences the thoracic vertebra. The ideal position of the thoracic vertebra is always noted, when the pelvis and the hipbone are in an ideal state. In the sagittal plane, the pelvic tilt and the position of the spine lordosis and kyphosis all are correlated[13]. The lordosis of the lumbar vertebra is increased when the pelvis is anteriorly tilted, and an optimal line is maintained in the whole of the spinal segment[14]. If it is tilted posteriorly, the lordosis of the lumbar region is reduced; the kyphosis of the thoracic vertebra will be increased[15]. The increase in kyphosis of the spine is caused by the force of the inspiratory muscles, and the force that is developed will cause difficulty in breathing. The increased kyphosis in the thoracic region reduces the lung capacity and thoracic cavity because of weakened and sagging chest position [16].

METHODOLOGY

Study design is observational. 50 male subjects with age group between 18-30 years with BMI $\leq$ 30 (Asian criteria) and WHR <0.90 were included and subjects with Cardiac and respiratory diseases, Gastro-intestinal diseases, Neurological diseases, Spinal deformity, Pelvic bone fracture, Spinal cord injury and any abdominal surgeries were excluded.

Procedure

The participants were explained about the procedure and a written informed consent was taken from them to participate in the study. Participants were selected on the basis of inclusion and exclusion criteria. Prior to the measurement of spirometric indices, subjects were instructed on how to use the computerized spirometry. In order to measure the lung capacity computerized spirometry (spiroexcel) was used. The measuring process required the subjects to make a tight seal with their mouth over the mouthpiece and attaching a clip to their nose. After breathing normally they were instructed to slowly expire until their lungs are empty and then they took a deep inspiration to fill up their lungs completely. As soon as the subject's lungs were full, they expired as hard and as fast as they could until their lungs were absolutely empty. Prior to measuring the spirometric indices, the participants were displayed their lung capacity performance on a computer monitor to provide motivation. For Forced Vital Capacity and Forced Expiratory Volume in 1second the participants took a deep breath in, as large as possible, and blew out as hard and as fast as possible and kept going until there is no air left. Peak Expiratory Flow rate is obtained from the Forced Vital Capacity and Forced Expiratory Volume1 manoeuver. Nose clips were essential as air can leak out due to the low flow. The inspiratory capacity was performed at the end of Forced Expiratory Volume in 1second /Forced Vital Capacity by taking a deep inspiration after normal expiration. The Inspiratory capacity (IC) was measured by asking the patient to breath normally and then exhale to the maximum slowly and then deep inspiration followed by normal breaths. Lung capacities were measured 3 times and the highest score was selected. After each trial, a rest period of 1min was given to prevent muscle fatigue. The subjects were instructed and demonstrated 2 to 3 times the anterior, neutral and posterior pelvic tilt position and pulmonary function test was assessed in each position. In order to prevent muscle fatigue rest period of 1minute was given after each session and a 5 minutes break between each position.

Table 1
Demographic da

CHARACTERISTICS	N%
Male	50(100%)
	MEAN ± SD
Age	20 ± 1.1
Waist Hip Ratio	0.93 ±.01
Body Mass Index	33.04 ±2.04

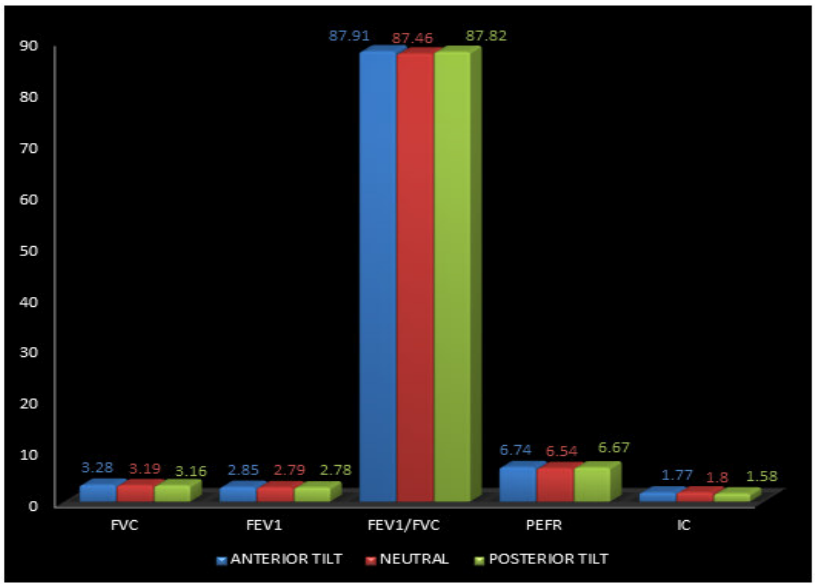
Table-1 shows that a total of 50 individuals were taken with the mean age of 20±1.1 years and mean Waist Hip Ratio of 0.93±.01 and mean Body Mass Index of 33.04±2.04.

Table 2
Comparison of Pulmonary Function Test Values in Different Pelvic Tilt Positions Among Obese Individuals (N=50)

S.no	Components	Tilt position	Mean	Sd	F value	P value
1	FVC	ANT	3.28	.57	.54	.58
		NEUT	3.19	.59		
		POST	3.16	.57		
2	FEV_1	ANT	2.85	.54	.20	.81
		NEUT	2.79	.56		
		POST	2.78	.54		
3	FEV_1/FVC	ANT	87.91	8.10	.03	.96
		NEUT	87.46	8.45		
		POST	87.82	9.14		
4	PEFR	ANT	6.74	3.00	.06	.93
		NEUT	6.54	2.68		
		POST	6.67	2.55		
5	IC	ANT	1.77	.55	1.63	.195
		NEUT	1.8	.80		
		POST	1.58	.51		

This table shows that the mean values of FVC, FEV1, FEV1/FVC, PEFR, IC in different tilt positions are not statistically significant (p>0.05)

Graph 1
Comparison of pulmonary function test values in different pelvic tilt positions among obese individuals (n=50)



RESULTS

TABLE 1 shows that a total of 50 individuals were taken with the mean age of 20±1.1 years and mean Waist Hip Ratio of 0.93±.014 and mean Body Mass Index of 33.04±2.04.TABLE 2 and GRAPH 1 shows that the mean values of FVC, FEV1, FEV1/FVC, PEFR, IC in different tilt positions are not statistically significant ($p>0.05$).

Figure 6
Pulmonary function Test measured with pelvis anteriorly tilted

Figure 7
Pulmonary Function Test measured with pelvis in Neutral

Figure 8
Pulmonary function Test measured with pelvis posteriorly tilted

DISCUSSION

The aim of this study was to find out the association of pulmonary function test and pelvic tilt positions in obese individuals. The lordosis of the lumbar vertebrae and the kyphosis of the thoracic vertebrae, the curve of spine and body posture are all inter-related which in turn has an effect on the lung capacity in subjects with normal body mass index. Obese individuals have exaggerated lumbar lordosis due to abdominal

fatness; hence will have an effect on lung capacities. The present study showed that there is no association between Pulmonary Function test and Pelvic tilt positions in obese individuals. This study showed that the mean values of Forced Vital Capacity, Forced Expiratory Volume in 1 second, Forced Expiratory Volume in 1 second/Forced Vital Capacity, Peak Expiratory Flow Rate and Inspiratory Capacity obtained from anterior, neutral and posterior pelvic tilt positions were almost similar and there was no statistical significance ($p>0.05$). Previous studies have shown similar mean values in our study, with anterior pelvic tilt values more than the neutral pelvic tilt and followed by posterior pelvic tilt[17], but with statistical significance. Forced Expiratory Volume in 1 second and Forced Vital Capacity showed higher mean values in anterior pelvic tilt positions when compared to neutral followed by posterior pelvic tilt position but not statistically significant ($p>0.05$). At anterior pelvic tilt, the abdominal muscles are overly stretched, the optimal length-tension relation of the muscle occurs, stretching it beyond its anatomical resting length[17]. Fang et al. suggested that the posture of the body influences both lung capacity and expiratory flow. O Sullivan et al. suggested that different upright posture alters the trunk muscle activation and concluded that the activities of the expiratory muscle were higher when the pelvis is tilted anteriorly[18]. Inspiratory Capacity shows higher mean values in the neutral position when compared to anterior pelvic tilt followed by posterior pelvic tilt position but not statistically significant ($p>0.05$). Previous studies have proved that spirometric indices increased in the standing posture where the pelvis is neutral, due to the inspiratory muscles and diaphragm activation in the upright posture[19]. Similarly, in the neutral pelvic tilt, the inspiratory capacity showed an increased mean value due to the optimal alignment of the spine. Forced Expiratory Volume in 1 second/Forced Vital Capacity, Peak Expiratory Flow Rate shows higher mean values in anterior pelvic tilt positions when compared to posterior pelvic tilt positions followed by neutral pelvic tilt position but not statistically significant ($p>0.05$). When the pelvis is tilted posteriorly, the abdominal muscles become less tense while the spinal extensors are stretched, decreasing the intra-abdominal pressure, which causes the diaphragm to contract towards the abdomen easily during the inspiration. Hence the amount of air inspired increases and Peak Expiratory Flow Rate increases accordingly[17]. The muscles responsible for lumbopelvic stabilization are very active to maintain erect posture and optimal alignment and these were less active during passive posture. Increased abdominal muscle strength causes increased contraction of the abdominal muscles and increased expiratory pressure. The erector spinae muscle and upper trapezius plays an important role in the traction of the chest and facilitates optimal lung capacity. The changes in the spinal curves also influence the efficiency of the diaphragm and other muscles of respiration to contract [20]. A change in the curve found in the cervical, thoracic, lumbar and sacral region will have a compensatory effect on other regions for the conservation of muscular energy and maintaining balance. The increased lumbar lordosis decreases the kyphosis of the thoracic region thus allowing the thoracic cage to expand more during inspiration[21]. Druz WS et al. suggested that the upright posture facilitates the diaphragm and inspiratory muscles activation. When the pelvis was tilted anteriorly, posteriorly and neutral there was no significant difference in Pulmonary Function Test values among obese individuals with Body Mass Index mean value-33.03 and Waist Hip Ratio mean value-0.93. This can be explained as obesity affects respiration by various mechanisms, the fat accumulation may impede the descent of the diaphragm during forced inspiration or by mechanically affecting the diaphragm movement and decreased chest wall movement. D.Conoy, R.Luben et al. concluded that there is an inverse relationship between abdominal obesity and respiratory function, both Forced Vital Capacity and Forced Expiratory Volume in 1 second were lower with higher values of Waist-Hip Ratio and this was consistent among both men and women[22]. Our study shows increased mean values in the anterior pelvic tilt position in obese individuals as they are associated with increased lordosis due to abdominal fat, with increased spinal lordosis and reduced kyphosis of the thoracic region giving greater room for the ribcage to expand during inspiration. Therefore the study suggests that anterior and neutral pelvic tilt positions are the most effective positions of respiration, performing respiratory exercise and pulmonary function testing in obese individuals.

CONCLUSION

The pulmonary function test values are higher in anterior pelvic tilt position when compared to neutral and posterior pelvic tilt position, however, the values are not statistically significant. Therefore this study concludes that there is no association between pulmonary function test and pelvic tilt positions in obese individuals.

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SP-25

DETERMINING MOBILE PHONE AND INTERNET ADDICTION AMONG HEALTH SCIENCE COLLEGE STUDENTS

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ABSTRACT

BACKGROUND: Activities associated with mobile phone and internet which is widely increasing all over the world and it is highly attracted by the young people and teenagers due to mobile phone and internet addiction there are symptoms like impaired impulse control, tolerance, stress, interpersonal problems, excessive use, psychological profiles by the level of internet use. OBJECTIVE: To identify the level of mobile phone and internet addiction among health science college students, SRMIST, kattankulathur. METHODOLOGY: A cross- sectional, observational study to find the level of addiction of internet and mobile phone was done among college students between age of 17 to 25 years of age using Internet Addiction Test (IAT) and Mobile Phone Addiction questionnaire as outcome measure. STUDY SETTING: Department of Health Science Colleges, SRM Institute of Science and Technology. PROCEDURE: 300 mobile phone users were selected and the two questionnaires was administered to all the subjects using pen and paper after which the score of the questionnaires was recorded and calculated for obtaining the results after the data analysis. RESULT AND CONCLUSION: The results obtained after data analysis were statistically significant in determining higher level of addiction among health science college students. The mean Internet addiction score mean 83.6 and the Mobile phone addiction score average was 58.8 respectively.

KEYWORDS: ***Psychological Problems, Stress, Excessive Use, Mobile Phone Addiction and Internet Questionnaire.***

INTRODUCTION

Mobile phones are most commonly used among young college going population. Restricted and purposeful use of mobile phones and internet can be beneficial for the students and college going population. Excessive use of mobile phones and surfing all the time on internet can make all get addicted to it. Mobile phone addiction is also defined as chronic or periodic obsessions caused by frequent usage of mobile phones, which may lead to intense or sustained demand of reliance and can also cause behavior problems. The excessive usage of mobile phone is often defined as dependence syndrome which is the term used by world health organization 1964 [1]. Internet addiction is described as a mental condition characterized by excessive use of internet called as excessive or poorly controlled ,changes in there behaviors due to prolong usage of computer and internet access that can lead to impairment or distress which is also called as impulse control disorder [2]. Mobile phone with internet now a days have become an essential and integral part of life. The people these days are more dependent on smart phone gadgets and devices that are often associated with change in behaviors like mood swings, depression, lack of concentration, irritability, etc[3]. But the use of mobile phones and internet has increased ten times, because of commercial business of telecom services providing unlimited access to the internet at a very nominal rate. Smart phone and internet addiction has been increased to 70% as the people who use continuously for 24 hours as they keep on checking about the updates and news feeds on social media platforms, which has led to a lack of direct interaction, man- to-man contact, memorizing the faces, contact numbers, birthday, etc. Due to digitalization and all time availability on the internet they neglect face to face conversations with their friends and family members. The mobile phone has both positive and negative impact on the life of individuals. The positive ways is the convenience to communicate anywhere, anytime, can be used for acquiring knowledge and information for educational purpose in which there are many advanced educational apps are available, many information can be obtained and can be shared through plenty of apps like what`s app , instagram , etc. Mobile phone has many specialized devices e.g. photo camera, video recorder or player, alarm clock, games etc. We can install

applications with the help of which we update ourselves, whether it is GPS for location and traffic updates, handy flash light, entertainment in form of watching movies music and gaming. The negative effect of mobile phones are difficulty in focusing on work unsociable, younger age groups are distracted and disturbed by gaming, watching movies, listening to loud music also have a serious impact on hearing and brain function. Usage of mobile phones for longer hours daily which may lead to serious health risk along with associated effects also, which includes increased low self-esteem , eye strain , restrictions in thumb movement, sleep disturbance, lack in physical activities, adaptation to prolong usage of mobile phone leading to chronic neck ache, and changes in postural alignment mostly. Recent studies suggests that prolonged usage of cell phones leads to brain tumor [4,] as the radiations from mobile phones are harmful to users which can lead to increase in reactive oxygen species, development of metabolic and neurodegenerative diseases[5]. Although the efficient and convenient use of internet for instant information is considered as an added benefit to mankind. The disadvantage being the unlimited usage of internet access leading to addiction due to prolonged usage this can lead to reduction of physical activity. Studies suggests that too much usage of internet can decrease the conscious level and memory, and can lead to psychological impairments , results in some studies even indicate poor, less peer and family interaction among internet and mobile users. More number of peoples who are addicted to mobile phone and internet are neglecting important activities, works due to over usage of mobile phones and internet addiction may cause such problems like: Carpal Tunnel Syndrome, severe headaches, eating irregularities (such as skipping meals), failure to attend there personal hygiene, and sleep disturbance, Dequervains tenosynovitis mobile[6]. Worldwide adolescents of age group 25 to 34 have highest use of mobile phone at rate of 62%. In recent years most of the global populations (especially college and university students) but the mobile phones can be used in beneficially in many ways. The internet users in India on December 2016 is of 11.37%, 2017 is of 481 billion, 2018 the internet and mobile phone association said that the internet users is expected to reach 500 million[7]. Internet addiction is impulse control disorder which develops emotional attachment with the online friends most commonly internet is used for surfing and when they feel lonely , stressed or depressed they use internet to divert there mind.

Aim and objective of the study

To determine the mobile phone and internet addiction among health science students.

METHODOLOGY AND PROCEDURE

A cross sectional, observational study was conducted among the students of health Science colleges to identify the internet and mobile addiction by using Internet Addiction Test and Mobile Phone Addiction questionnaire as an outcome measure to determine the addiction among the college students between the age group of 19 to 25 years. 300 samples were selected randomly from the various Department of health science colleges over a period of 1 month. The subjects who were smartphone users from past 2 years were included in the study and should be between the ages of 19 to 25 years and should be willing to participate in the study. The IAT score was obtained by marking the option on a 4 pointer scale from 1 to 4 and the total score was calculated and was categorized into 3categories according the scoring ranges as mild (score), moderate (score), severe addiction. (Score). While the MPA scores were based on the answers marked on a 5 pointer Likert scale. The higher the score the more addiction it implies. After administering the questionnaires from the participants the data was recorded and calculated accordingly and the results were obtained after the data analysis using SPSS version 20.

DATA ANALYSIS

Table 1

Shows that the percentile of usage of internet according to the IAT questionnaire scores. It depicts the cumulative percent of IAT scores

IAT CATEGORY	Frequency	Percent	Valid Percent	Cumulative Percent
Low addiction	175	58.5	58.5	58.5
Average online user	117	39.1	39.1	97.7
Occasional(or)frequent	7	2.3	2.3	100.0

Problems because of over				
Usage internet				
Total	**299**	**100.0**	**100.0**	

Table 2
Shows mean age and mean IAT score.

	N	Minimum	Maximum	Mean	Std. Deviation
Age	300	17.00	28.00	19.4716	1.88290
Iat score	300	10.00	87.00	44.7057	17.19295

Table 3
The mobile phone addiction (MPA SCORES)

	Average
Mobile phone addiction	58.83333

Table 4
Shows the iat mean

	N	Minimum	Maximum	Mean	Std. Deviation
Iat score	299	37.00	98.00	83.6254	7.34208
Valid N (list wise)	299				

RESULTS

Table 1 shows that low addiction frequency of 175 was observed as low addiction to internet carrying a total percentage of 58.5% of sample population .While the average online users were observed to be 117 in number with total percentage of 39.1 %. Occasional or frequent problems because of internet were observed is 7 in number with the total 2.3%. While table 2 shows the values of the mean age of the sample population. Table 3 the mean MPA score is found to be 58.84. Table 4 shows about the internet addiction mean which shows that more number of young age peoples are addicted to internet 83.6254

DISCUSSION

From the above data analysis we got to know that the mean score of IAT is 83.6254 which indicates higher level of internet addiction among Health Science college students, associated with the use of smartphones impacting their life, with a mean age of 19 years were comparatively having higher level of addiction. Despite obvious difference among cultures, communities, societies, the prolong usage of mobile phones is a global phenomenon. According to data from international telecommunication union, an agency of the world health which shows that there is a promotion of global development of communication, at present some data shows us that there are almost many mobile phones are used by the people in the world (ICT data, statistics division of 2015) [8].In the course of last 15 years the worldwide mobile phone subscription have gradually increased from 10 % to 97% of the total population. India and Pakistan which shows that there are more penetration index values of 80% (telecom authority of India) [9]. Many researchers concluded that most of the potential problems are especially caused by these technologies are more seen in young age people (Thom et al., 2011)[10]. Withdrawal symptoms like severe emotional disturbances, when not able to use mobile phones due to repair etc., difficulty in controlling usage of mobile phones (inability to stop the usage of mobile phone and internet in many circumstances) but the students try to control the usage of mobile phones. Due to lack of interaction can lead to familial or social problems which are faced by each and every health science students due to prolong usage of mobile phones and internet. Collected data from 4156 adult aged 20 to 24years observed that there is more usage of mobile phones in the night time and facing mental health

outcomes thome et.al, [11]. Excessive use of mobile phones can lead to reduction in the quality of interpersonal relationships and lack of productivity in daily life. The several studies shows that more usage of mobile phone can cause behavioral alteration and induce addictive behavior. The younger age people who stay in their home or in hostel there is no difference in usage of mobile phone both results the same addiction. The hostel students are more addicted in group gaming now days which can cause behavioral problems, anger when not able to get new mobile phones, availability of WI - FI Facility in mobile phones can be used in residence place and work premises also increase mobile phone dependence. Due to WI - FI facilities the usage of internet is more and can reduce intellectual capabilities and work efficacy. Health issues are occurring in personal and environmental. personal like depression, anger, sleep disturbance , eye strain, restricted movements in there shoulder and thumb due to prolong usage of mobile phone and internet more than an hour in same position, Hearing loss, head ache , brain tumors etc. The environmental issues like accidents due to hearing music, watching movies, conversations in mobile phones while driving etc. the internet addiction is more addicted in boys than girls.

Limitations

Sample size could be extended more than 1000 Willingness to participate in the study Further study can be done on psychological problem along with questionnaire, physical activity questionnaire and neck posture assessment can be done

Recommendations

Prevalence of mobile phone and internet addiction is found to be high among age group 25 to 35, so further studies can be conducted on other age groups in order to support /extended the study.

CONCLUSION

This study concludes that internet addiction is more when compared to mobile phone addiction among young college students .This internet addiction leads to decreased physical activity and results in obesity, psychological problems, and depression, excessive use.

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SP-26

TO ANALYSE THE IMPACT OF BEST TOOL AMONG MULTIPLE TOOLS FOR THE SAME FACTOR-A MIXED SURVEY

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ABSTRACT

OBJECTIVE: Assessment is a key factor to be considered among all paediatric conditions mainly for the improvement or progression of treatment, as well as for the referral in order to make perfect diagnosis, Nowadays a vast difference of opinion from therapist to therapist because of multiple tools for the same factor. At last we want to know best tool for the same factor analysis, the main objective is to find out the assessment tools which has been used commonly. All you need is a proper assessment tool for checking the process. BACKGROUND: The purpose of the survey is to find out the use of various assessment tools for same category or factor to diagnose a condition makes an impact. It also aims to check which assessment tool is widely used for paediatric conditions. We have used WCPT guidelines characterized by ICF model in which our target is on major factors such as Posture/Balance, Gross motor skills, Fine motor skills, Developmental screening tools, Quality of life. METHODOLOGY: The study type is an observational (survey) type; where a link was send through google drive to all the known paediatric practitioner, physiotherapists and occupational therapists, on the basis of the previous criteria .after receiving the data from the sources data interpretation will be done accordingly. Each criteria has various assessment tools which have been used for analysis through which the reliability of these tools can be known. RESULTS: The results of study shows that multiple tools for same factor have been found, but only few tools have been used by health care professionals and most importantly same tool has been experimented for diagnostic purpose.

KEYWORDS: ***Multiple assessments, paediatric conditions.***

INTRODUCTION

Assessment is a key role in the patient diagnosis for the improvement or progression of treatment protocol and for the outcome measure for any condition, that too in case of paediatric conditions there are many confusions and consequences faced among the students, clinicians, therapists like physiotherapist and occupational therapist who deals with the paediatric neurological conditions. Comparing with other fields of diagnosis, paediatric assessment plays a major role in the development of the child. As it is one of deciding diagnostic criteria for exact diagnosis of child development, because diagnosis makes the therapist for tailored management for the children with disabilities. From the milestone or development of the child every miniature changes in skills improves whole lifestyle. Any changes from the normal process of development, earlier the process start an early intervention to prevent disabilities and this process to be considered as part of therapy. Factors regarding paediatric assessment should achieve the aim, need and easy to analyse. A proper assessment should achieve all the known factors that need to be considered for diagnosis, but sadly many health care professionals dealing with paediatrics don't know what are the factors, what tool has to be used for particular factor in the assessment. Developmental screening tools have to be used by health care professionals as it helps in early intervention for the betterment of child care. According to the WCPT guidelines ICF published 14 important paediatric assessment factors recently in 2018,4it also contains various tools in each category i.e. factors. Though there are many tools in each factor, very few tools are used in practice. And some tools are not known by all the health care professions. The factors need to be considered by all the health care professionals, we have used major five factors and its tools for the survey of the study, as these five factors are considered to be the most important in the assessment of the child. This factor depends upon highly valid reliability, validity of each assessment tool. The major factors used in this study for survey is Posture/ Balance; Gross motor skills, Fine motor skills, Developmental screening tool and Quality of life. Among each factor there are few tools under it. Each assessment tool has various queries

and activities but they aim of the same factor. The major difference comes with each tool according to the feasibility, time, and availability of the tool. As many tools are known for high cost and the customized version is not available, it cannot be used in all clinical. The other differences between the tools used are done by the person who does the assessment. So, that available in practice with advantages and disadvantages are known and can further studies can be done.

Posture/balance

- Early Clinical Assessment Of Balance (ECAB)
- Movement assessment of infants (MAI)
- paediatric balance scale (PBS)
- paediatric Clinical Test Of Sensory Integration Of Balance (P-CTSIB)
- Paediatric Reach Test (Pediatric Functional Reach Test)
- Timed Up And Down Stairs Test

Gross motor

- Albert Infant Measure Scales (AIMS)
- Bruininks-Oseretsky Test Of Motor Proficiency (BOTP-2)
- Gross Motor Functional Measure
- Gross Motor Performance Measure
- High Level Mobility Assessment (HIMAT)
- Motor Functional Measure
- Peabody Development Motor
- Scales Second Edition (PDMS-2)
- Test Of Gross Motor Development 2nd Edition (TGMD-2)
- Test Of Infant Motor Performance (TIMP)

Fine motor

- Bruininks-Oseretsky Test Of Motor Proficiency (BOTP-2)
- Jebsen Taylor Test Of Hand Function
- Nine- Hole Peg Test
- Peabody Developmental Motor Scale Second Edition (PDMS-2)
- Assisting Hand Assessment
- Shriner's Upper Extremity Assessment
- Melbourne Unilateral Upper Limb Function (MUUL)

Developmental screening tool

- Ages & Stages Questionnaires (ASQ-3)
- Assessment, Evaluation And Programming System for Infants And Children (AEPS)-Second Edition
- Barley Infant Neurodevelopmental Screener (BINS)
- Carolina Curriculum For Infants And Toddlers With Special Needs, Third Edition
- Carolina Curriculum For Pre-Schoolers With Special Needs
- First STEP: Screening Test For Evaluating Pre-Schoolers
- Motor Skills Acquisition In The First Year And Checklist

Quality of life

- Child Health Index Of Life With Disabilities
- Kid screen
- paediatric Quality Of Life Inventory (PEDS QL)
- Paediatric Outcomes Data Collection Instrument (PODCI)
- Quality Of Well Being Scale (QWB)

These major factor tools are taken for the survey and the opinions from health care professions on factors in assessment are analysed with graphical representations.

Aim of the study

The aim of the study is to analyse the impact of best tool among multiple tools for the same factor-a mixed survey.

Need of the study

Paediatric assessment tools for different factors has to be known to all health care professionals Each factor has multiple assessment tools from which only few tools are used.

METHODOLOGY

Study design

Non-experimental, STUDY TYPE: Observation type (Mixed - Survey), SAMPLE SIZE: 68, SAMPLING METHOD: Convenient sampling. STUDY DURATION: One Month.

Inclusion criteria

Health care professionals like physiotherapist, occupational therapist, paediatric physician with experience of 2 years, who can fill the survey form in online.

Exclusion criteria

Undergraduate students of health care professionals were not included.

Procedure

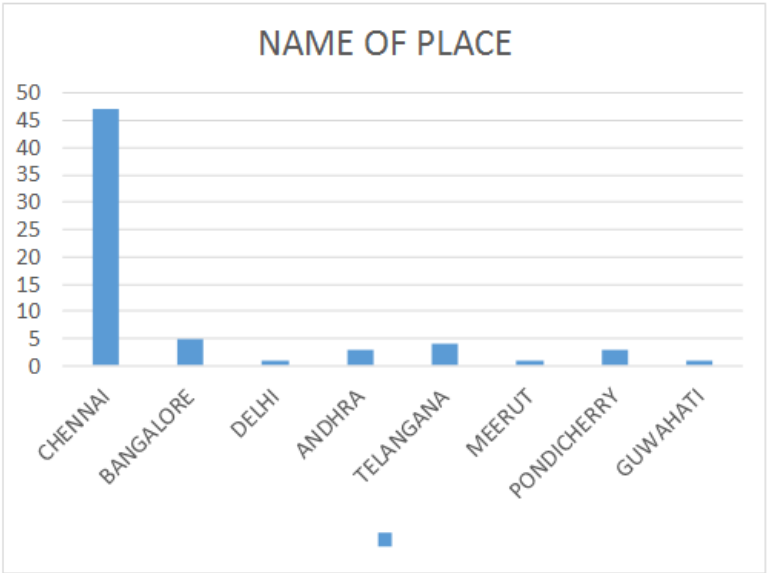
The samples are collected according to inclusion and exclusion criteria. The samples are collected through google docs as a survey method by a link attached. The survey was created and the link was sent to all the known health care professionals and asked to fill it with required details. The major factor among the paediatric assessment were taken, that is

1. Posture / Balance
2. Gross motor skills
3. Fine motor skills
4. Developmental screening tool
5. Quality of life

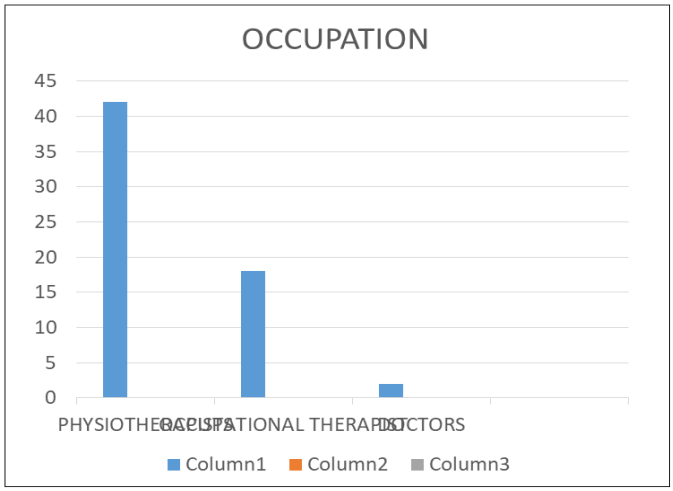
Within one Month of study survey about 70 samples were responded from which 68 samples are included. The 68 samples gave their opinions by selecting the known tool for each factor of assessment like each factor had multiple tools as options through which a single option need to be selected.

RESULTS

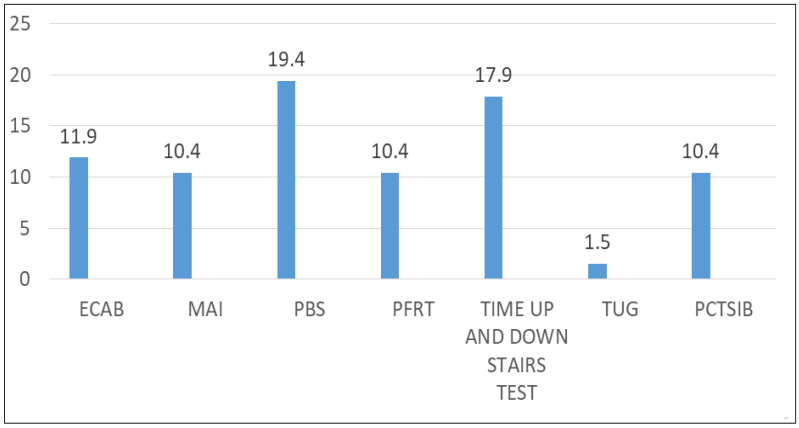
Place of response=64 responses



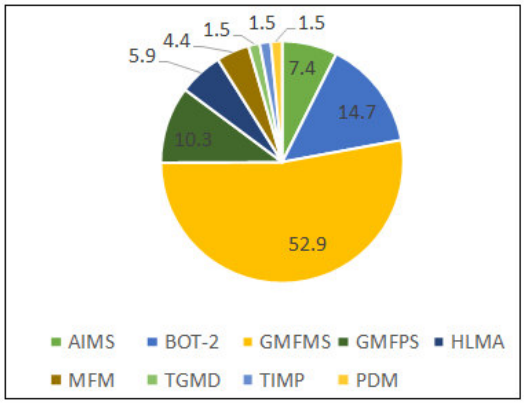
Occupation 62 responses



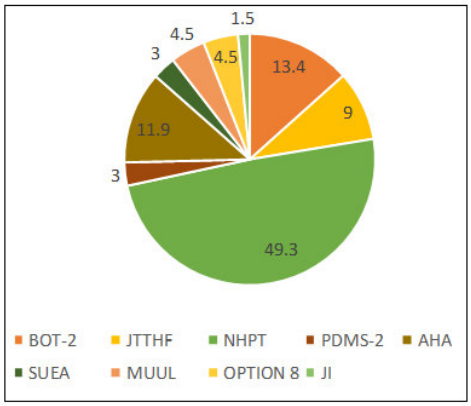
Posture/ balance



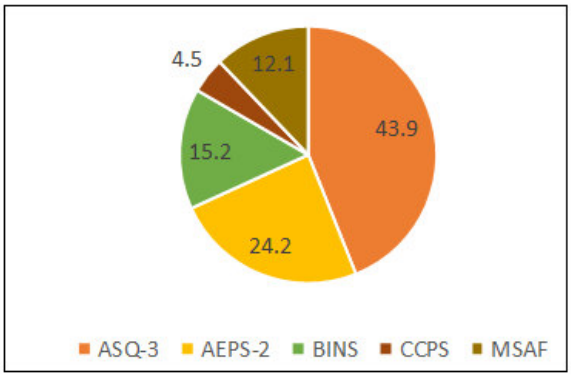
Gross motor



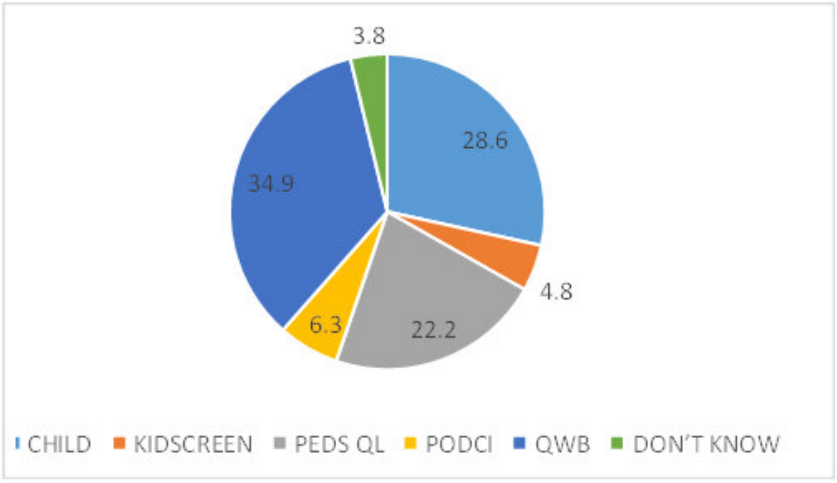
Fine motor



Developmental screening tool



Quality of life



DISCUSSION

From the above analysis we got to know that multiple tools available for the same factor, but people stick on same tools repeatedly. The major factors of the assessment are not known to all the health care professionals, this study can be aware of the multiple tools available in paediatrics. Among the 70 samples only 68 were recruited as the two samples has been reported twice. The samples were taken, from the response for single tool for each factor, since many of the responses where not found in each factor. Most of the responses were found for only three factors, so the responses with minimal category of 3 were included in the study. Even though the health care professionals are known of paediatric assessments, many don't know about the multiple tools present for each factor.

GRAPH 1 shows that the response from all paediatric health care professionals from all over India, among which 64 responses have been recorded from survey method, where Chennai have been recorded first, then comes on other cities.
GRAPH 2 shows the occupations of health care professionals among which physiotherapists have been reported higher and then the occupational therapists,
GRAPH 3 shows the Posture/ Balance assessments among which Paediatric Balance Scale have been used by the health professionals with 19.4%. Time Up and Down stairs test with 17.9% and 18 people have been recorded with this scale.
GRAPH 4 shows the Gross motor scales of assessment among which Gross Motor Functional Measure Score with 52.9 %. And Test For Gross Motor Development with 14.7 % in the second position.
GRAPH 5 shows the Fine motor scales with the highest assessment tool of Nine Peg Hole Test with 49.3%, and Assisting Hand Assessment with 11.9 %.
GRAPH 6 shows the Developmental Screening Tool with highest score of 43.9% of Ages and Stages Questionnaire-3, Assessment, Evaluation and Programming System for Infants and Children (AEPS)-Second Edition with 24.2%.
GRAPH 7 shows the Quality Of Life assessment tools, where 34.9% have been recorded with Quality of Well Being, and 28.6 % with Child Health Index of Life with Disabilities.

CONCLUSION AND RECOMMENDATION

The study concludes that multiple assessment tools are available for same factor, but in case of research majorly one or two tools are only used. The research can also be done with other tools available. The health care professionals has to know about the available tools – advantages, disadvantages of each tool and then select it as an outcome measure. All the tools have to be experienced with practice, so that the availability of each tool will be improved. In case of highly feasibility of tool, the research can be done as a customized usage. So that a trial and error can be known. As many tools are of high cost, the available tools are repeatedly used. The survey method can be done with only specific group of health care professionals.For each tool, factors has to be analysed and then tool has to be used for research purpose as many do blind selection of tools by their title for research purpose.

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13. Screening Tools Table: Social & Emotional Devt - Birth to 5 years U.S. Dept of Education & National Early Childhood Technical Assistance Center.

SP-27

EVALUATION OF PULMONARY FUNCTION IN ATTENTION DEFICIT HYPERACTIVITY DISORDER CHILDREN – AN OBSERVATIONAL STUDY

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ABSTRACT

BACKGROUND: Attention Deficit Hyperactivity disorder is common in children of age group between 6 to 12 years. It is the neuropsychiatric or neurodevelopmental disorder that affects 6% to 9% of children population. Causes may be due to cigarette smoking, alcohol use of women during pregnancy or may be due to brain injury or low birth weight of the child. OBJECTIVE: The aim of the study was to evaluate the Pulmonary Function in Attention Deficit Hyperactivity disorder children, comparing those values with normal children. METHODOLOGY: This study was observational study, non-experimental type, age between 10 – 15 years, subtypes II and III of Attention Deficit Hyperactivity Disorder and children who were able to communicate were included in the study. Any disease or deformities in children were excluded. RESULTS: On observing the pulmonary function of Attention Deficit Hyperactivity Disorder children and comparing to the normal the mean value of FVC shows 1.1967 and 2.1333, FEV_1 was 0.8487 and 1.8633, FEV_1 / FVC was 73.0493 and 87.558, PEF was 2.8613 and 4.5267, PIF was 1.1067 and 2.3973 respectively. Which was significantly reduced in Attention Deficit Hyperactivity Disorder when compared to normal children. CONCLUSION: The study concludes that there was reduction of Pulmonary Function in Attention Deficit Hyperactivity Disorder children when compared to the Normal individuals of same age group and recommends further assessment of these children for the better improvement in their quality of life.

KEY WORDS: ***Attention Deficit Hyperactivity Disorder, subtypes II and III, Pulmonary Function Test.***

INTRODUCTION

Attention is awareness of the environment or responsiveness to a stimuli or task without being distracted by other stimuli. It is the capacities of the brain to process the information from the environment or from long term memory Attention disorder include impairments in sustained attention, selective attention, divided attention or alternating attention. Attention deficit hyperactivity disorder (ADHD) is a common childhood neuropsychiatric or neurodevelopmental disorder estimated to affect 6% to 9 % of school age children. It is caused by cigarette smoking, alcohol use or drug use of women during pregnancy; or may be due to low birth weight or brain injuries of the child. Attention deficit hyperactivity disorder causes substantial problems in children who are affected. It is associated with many other psychiatric disorders in particular anxiety and mood disorders. Difficult in paying attention (inattention) and hyperactivity / impulsivity are the key behaviors of attention deficit hyperactivity disorder. Some children with attention deficit hyperactivity disorder only have problems with one of the behaviors, while others have both inattention and hyperactive-impulsivity. Attention deficit hyperactivity disorder is divided into three subtypes:

1. Predominantly inattentive (ADHD-PI or ADHD-I)
2. Predominantly hyperactive – impulsive (ADHD-PH or ADHD-HI)
3. Combined type (ADHD – C)

Many children with attention deficit hyperactivity disorder have a good attention span for the tasks they find interesting. Girls tend to have less hyperactivity, inattention but have more intellectual problems. During last 10 – 15 years attention deficit hyperactivity disorder has the focus of increasing interest in psychiatry. As there is study like there is prevalence of asthma in adult attention deficit hyperactivity disorder, this study is

done to evaluate the pulmonary function of the children with attention deficit hyperactivity disorder using computerized spirometry.

Pulmonary function test

Pulmonary function test or lung function test is used to measure the functional lung volumes and capacities. It is useful in assessing the functional status of the respiratory system and to find the severity of pulmonary impairment. Changes in lung volumes and capacities are generally consistent with the pattern of impairment. SPIROMETRY one of the pulmonary function tests helps in assessing the breathing pattern that identify conditions such as asthma, pulmonary fibrosis and COPD. The graphical representation of lung volumes and capacities is called SPIROGRAM. Lung volumes and capacities increases with obstructive lung disease and decreases with restrictive lung disease. Spirometry was performed and the accepted flow volumes curves were obtained with Forced Vital Capacity (FVC), Forced Expiratory Volumes in one second (FEV1), ratio of Forced Vital Capacity and Forced Expiratory Volume in one second (FVC:FEV1), Peak Expiratory Flow (PEF), Peak Inspiratory Flow (PIF)and Forced Expiratory Flow (FEF).Forced Expiratory Volume (FEV) is obtained by the forced expiration that is started from full inspiration . It reaches the maximum or peak called as Peak Expiratory Flow (PEF).Forced Expiratory Volume in one second is the volume of air expired in one second during the test. Forced Expiratory Volume in second and Peak Expiratory Flow rate are well correlated, but forced expiratory volume in one second measures average flow rate over a larger lung volumes than the Peak Expiratory Flow. Forced Vital Capacity is the maximum volume of air that can be expelled out forcefully after a deep inspiration. Forced Expiratory Volume in one second is usually at least 75% of the Forced Vital Capacity.

MATERIALS AND METHODS

Study design : Non Experimental design
Study type : observational study
Sampling method : convenient sampling
Sample size : 30 subjects
Study setting : Maithree special school, Tambaram. Government higher secondary school, guduvanchery

Inclusion criteria

For attention deficit hyperactivity disorder

Attention deficit hyperactivity disorder children of subtypes II and III reported by physician.
Age between 10- 15years
Children those who are able to communicate.
Both boys and girls.

For normal children

Healthy children.
Between 6 - 12 years of age.
Both boys and girls.

Exclusion criteria

Cardiac diseases.
Spinal diseases and deformity.
Chest wall deformities like pectus carinatum, pectus excavatum, scoliosis, kyphosis, lordships, and lung infections.
Acute stomach or related diseases.
Spinal cord fracture.

Materials used

Computerized spirometry.
Spiro excel kit
Cotton piece
Sterilizer
Data collection sheet

Procedure

According to inclusion and exclusion criteria 30 subjects are selected and divided into two groups (group A –Attention Deficit Hyperactivity Disorder children and group B – Normal children). Subtypes II (Hyperactivity – Impulsivity) and Subtypes III (Combined) of Attention Deficit Hyperactivity Disorder children were selected with the help of NICHQ Vanderbilt assessment scale (teacher informant). This scale has a total of 31 questions that was asked to the teacher of the respective students, the question was about the activities of the students in the classroom. It was then scored and subtypes of Attention Deficit Hyperactivity Disorder were diagnosed. The participants and the parent/Guardian were explained about the procedure and informed consent were taken to participate in the study. Confident is gained by properly explaining about the need for the test to both parent and children.Pulmonary function test is done using computerized spirometry. The spiroexcel software were installed in the laptop and it is connected to the mouth piece using USB cable that is provided in the Siproexcelkit. The mouth piece is then sterilized with the help of sterilizer and cotton and made it to dry for a minute. The child is made to sit in a relaxed position and instructed how to use the equipement. Proper demonstration was given .The process including that the child made a tight seal with their mouth over the mouth piece.,First the child is asked to breath in and out normally , and then breath in as much as possible followed by quick expiration to the maximum and then again inspire .Three trail was taken and the best performance of the three is adopted . Between each trail a rest is given to prevent hyperventilation. The measurements or the graph of the lung volumes is monitored and recorded. The measurement done in attention deficit hyperactivity disorder children is then compared with the normal children to find the differences.

RESULTS AND DISCUSSION

A total of 15 Attention deficit hyperactivity Disorder children were included in the study, in that boy to girl ratio was 3: 1 the mean age of the children was 10 to 15 years. All were of type II and type III subtypes of Attention Deficit Hyperactivity Disorder which was assessed using NICHQ Vanderbilt assessment scale-teacher informant. Table 1 shows the mean differences of Pulmonary Function Test Values of 15 Attention Deficit Hyperactivity disorder children and 15 Normal children that was examined using computerized spirometry . The mean value of FVC of ADHD and Normal was 1.1967 and 2.1333, FEV_1 was 0.8487 and 1.8633, FEV_1 / FVC was 73.0493 and 87.558, PEF was 2.8613 and 4.5267, PIF was 1.1067 and 2.3973 respectively. There was reduced FVC , FEV_1 and near to normal FEV_1 / FVC ratio in Attention Deficit Hyperactivity Disorder children when compared to normal children of same age, it shows that there may be restrictive type lung disease in Attention Deficit Hyperactivity Disorder children. Graph 1 shows the comparison of mean Pulmonary Function Test values of Attention Deficit Hyperactivity Disorder children and Normal children of same age group. In this study 30 subjects were selected according to inclusion and exclusion criteria in which 15 were attention deficit hyperactivity disorder children and 15 were normal children. For both the group Pulmonary Function Test was done using computerized spirometry. Forced Vital Capacity, Forced Expiratory Volume in one second, Forced Expiratory Volume in one second and Forced Vital Capacity ratio, Peak Expiratory Flow, Peak Inspiratory Flow were noted. This study was done to make a record that Attention Deficit Hyperactivity Disorder children has decreased pulmonary function when compared to normal children of same age group , as there is no record done to our knowledge . The statistical result of Pulmonary Function Testing showed significant reduction in Attention Deficit Hyperactivity Disorder children when compared to normal children. The mean values comparing normal and Attention Deficit Hyperactivity Disorder are Forced Vital Capacity 2.1333 and 1.1967, Forced Expiratory Volume in one second 1.8633 and 0.8487, Forced Expiratory Volume in One second and Forced Vital Capacity ratio 87.55 and 73.04, Peak Expiratory Flow 4.5267 and 2.8613, Peak Inspiratory Flow 2.3973 and 1.1067 respectively, which shows reduction in the Lung volumes and Capacity. The etiology of Attention Deficit Hyperactivity Disorder is not specific but all neuropsychiatric problems are due a combination of genetic factor, environmental factor and biological factor. It may also be due to the prenatal and perinatal risk factors that contribute to pathophysiology of Attention Deficit Hyperactivity Disorder. It is believed to be due to the abnormalities in frontal region of brain. It may due to the catecholamine dysfunction, in which catecholamines are neurotransmitter that is responsible for higher functions such as attention and focus, Catecholamine administration produce fetal hypoxia. The reason for catecholamine dysfunction is due to dopamine deficiency that is produced in brain. Dopamine interacts with environmental toxins and produce hyperactivity. Sedky and Karim in 2013 has Suggested that there is relation between sleep disorder breathing and Attention Deficit Hyperactivity Disorder symptoms. Scott J.Hunter in 2016 has determined that sleep disorder breathing in normal children may have adverse change neurocognitive

functioning that affects the child's capabilities to attain the academic and adaptive goals. Sleep Disorder Breathing is due to upper airway resistance, alveolar hypoventilation and recurrent upper airway obstruction that occurs during sleep. So this studies goes in hand saying that pulmonary function is reduced in Attention Deficit Hyperactivity Disorder children. Yue Chen in 2009 has correlated waist circumference with pulmonary function in children of 6-17 years of age group. He says that increase in the waist circumference has reduction in the Forced Expiratory Volume in one second and Forced Vital Capacity ratio. Waist circumference has larger impact on Forced Vital Capacity than Forced Expiratory Volume in one second.
Jin Young Choi in 2009 has stated that the levels of nutritional knowledge were lower and worse dietary habits in Attention Deficit Hyperactivity Disorder children when compared to the normal children. Abdominal obesity is also associated with pulmonary function reduction has it increases the abdominal pressure this in return produce upward displacement of diaphragm. Obesity also increases the pleural pressure results in lower Forced Vital Capacity .There may also have changes in breathing pattern. For boys the breathing pattern should be abdominothoracic and for girls it should be thoracoabdominal. This pattern should also be taken into account. Erica D Musser in 2013 states that children with Attention Deficit Hyperactivity disorder have autonomic nervous system dysfunction that displays pattern of inflexible and ineffective physiological responding to emotion regulation. Autonomic nervous system primarily innervates the smooth musculature of all organs such as heart, lungs and also glands [7]. It is responsible for the control of bodily function which is not consciously regulated, like breathing, heart beat and digestive process. Children with Attention Deficit Hyperactivity Disorder have elevated parasympathetic mechanism when compared to control group but there is no difference in sympathetic activity [8]. The prefrontal cortex, which is vital for attention is hypofunctional in Attention Deficit Hyperactivity Disorder children. Changes in lung volumes and capacities are generally consistent with the pattern of impairment. In restrictive type FVC and FEV_1 will be reduced and its ratio is increased whereas in obstructive type FVC will be near to normal and FEV_1, FEV_1/ FVC will be reduced[11].Asthma is effectively an allergic condition in which the airways become over-responsive and 'twitchy'. In an acute attack of asthma there is widespread narrowing of airways, with bronchospasm, mucosal edema , inflammation and mucus plugging of small airways . These changes result in the reduction of Peak Expiratory Flow Rate, Forced Expiratory Volume in one second and Forced Vital Capacity ratio and Increases in Total Lung Volume and Residual Volume. In adult Attention Deficit Hyperactivity Disorder there is high prevalence of asthma if the pulmonary function in early childhood is not treated. As there is reduced pulmonary function lead to lack of lung activity leads to upper respiratory obstruction that may cause asthma and other respiratory diseases.

Figure 1

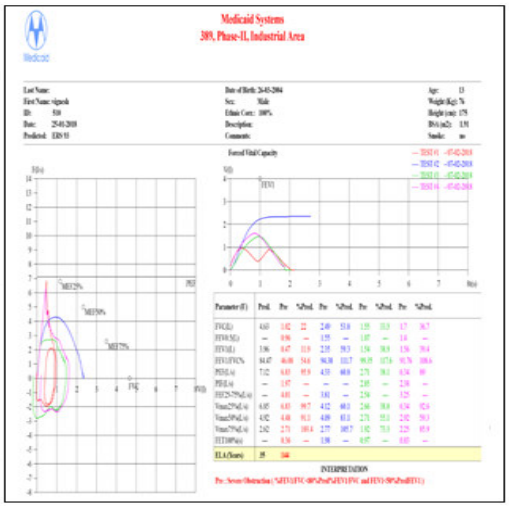


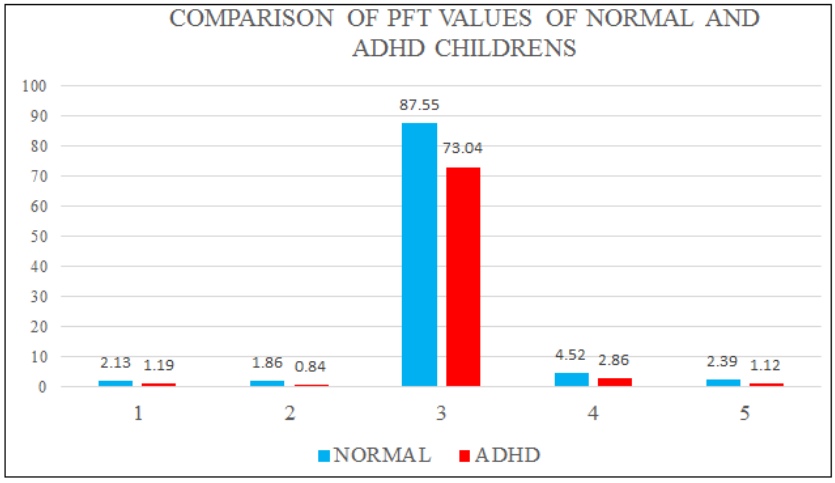
Table 1

Shows the mean, standard deviation, paired "t" value and "p" value of Group- A

Variables	Mean		AGE	N		Standard deviation		STD.error mean		t	Sig.
	Normal	Adhd		Normal	Adhd	Normal	Adhd	Normal	Adhd		
FVC	2.13	1.19	10-15	15	15	0.60	0.52	0.15	0.13	4.54	.000
FEV1	1.86	0.84				0.54	0.51	0.14	0.13	5.24	
FVC/FEV1	87.55	73.04				6.08	22.77	1.57	5.88	2.38	
PEF	4.52	2.86				1.70	1.52	0.44	0.39	2.81	
PIF	2.39	1.12				1.41	0.57	0.36	0.14	3.26	

Graph 1

Shows the comparison of Pulmonary Function Test values obtained in both Normal and Attention Deficit Hyperactivity Disorder children



CONCLUSION

In conclusion, the pulmonary function of Attention Deficit Hyperactivity Disorder children is significantly reduced when it is statistically analyzed. All the values including Forced Vital Capacity, Forced Expiratory Volume in one second, Forced Expiratory Volume in one second and Forced Vital Capacity Ratio, Peak Expiratory Flow, Peak Inspiratory Flow were reduced.

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SP-28

PREVALANCE OF HAMSTRING TIGHTNESS AMONG PHYSIOTHERAPY COLLEGE STUDENTS

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ABSTRACT

The hamstring muscle is a potential factor that accounts for coordination of lumbar spine, pelvis and lower extremities. Hamstring tightness leads to low back pain and gait abnormality. The study aimed to determine the prevalence of hamstring tightness among physiotherapy college going students. A non-experimental design observational type was carried out on 100 sample of physiotherapy students. The study included 50 male and 50 female samples of age 18- 22. The study was performed on normal healthy individuals. The study excluded persons with recent hamstring injury and low back pain less than 2 months. Tripod sign test and hamstring flexibility test was performed and evaluated. The mean difference of hamstring flexibility of male on left side is more than right side. The mean difference of hamstring flexibility is more on left side than right side. The study concludes that there is an equal prevalence of developing hamstring tightness in both male and female of young population. Hence increased physical activity is advised to prevent the musculoskeletal disorders.

KEYWORDS: ***hamstring tightness, hamstring flexibility test, physiotherapy students.***

INTRODUCTION

The hamstring muscle is a major factor that accounts for coordination of lumbar spine and pelvis with lower extremities. Increased sedentary lifestyle has resulted in development of hamstring tightness in young adults. Hamstring tightness leads to low back pain and gait abnormality. Decreased flexibility cause damage musculoskeletal system due to overuse. Hamstring muscles being a multi joint muscle that frequently damaged due to tightness .It also accounts for the higher risk of injury and hinder the performance of the athletes. The previous studies has not focused on the equal amount of sample of male and female students who are prone for hamstring muscle tightness. Thus this study investigates on gender equality of hamstring tightness among college students. The study aimed to determine the prevalence of hamstring tightness among physiotherapy college going students.

METHODOLOGY

Study design

This study was conducted at SRM college of physiotherapy, SRM institute of science and technology. A non experimental design observational study was carried out on 100 samples of physiotherapy students.

Subjects

The study included 50 healthy male volunteers and 50 female volunteers within age group of 18-22 years. The study excluded persons with recent hamstring injury and low back pain less than 2 months.

Test procedures

Participants were informed about the procedure and tested for hamstring tightness with two special test that include tripod sign and hamstring flexibility test. Tripod sign is the special test conducted in sitting position with hip and knee at 90˚ angle, straighten the knees out in front of you without tilting the pelvis. The sign is positive if there is arching of the low back due ightness of hamstring muscle. Hamstring flexibility test is carried out by the sample lying in supine. The hip is passively flexed until the thigh is vertical. Maintain this thigh position throughout the test with opposite leg fully extended position. The foot of the leg is being tested is kept relaxed, while the leg is actively straightened until the point when the thigh begins to move from the vertical position. The measurements were the minimum angle of knee flexion with the thigh in

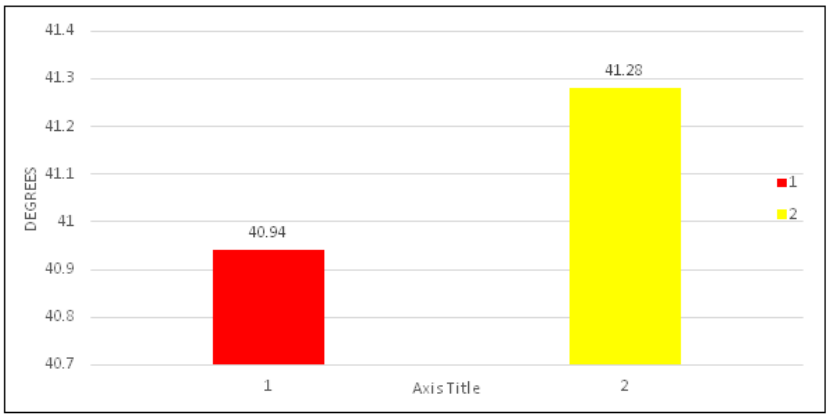
vertical position.if the participant can fully straightened the leg, angle would be recorded as 0˚ while any degree of flexion will be recorded as positive, example - 10˚,20˚.

RESULT

In this study there are 100 participants out of which 50 male and 50 female are assessed. The mean difference of hamstring flexibility of male on left side is more than right side. The mean difference of hamstring flexibility of female is more on left side than right side.

Graph 1

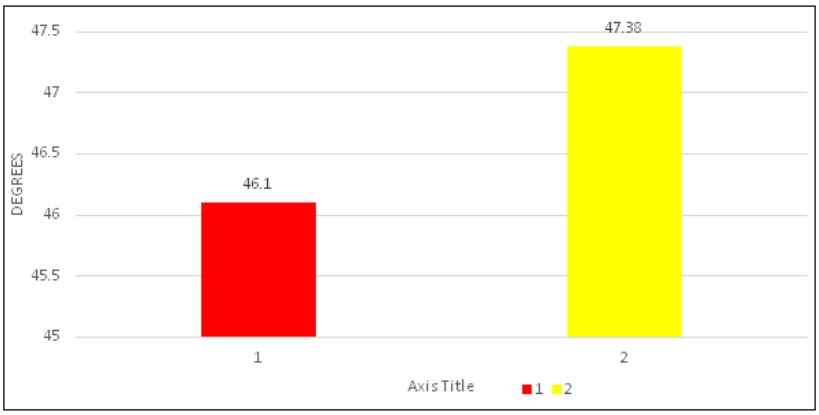
Hamstring flexibility on females



In graph 1 represents the hamstring flexibility of female is more on left side than right side. Mean difference of left side of 41.28 and right side is 40.94

Graph 2

Hamstring flexibility on males



In graph 2 represents the hamstring flexibility of male ismore on left side than right side. Mean difference of left side is 47.38 and right side is 46.1

DISCUSSION

The lack of literature about hamstring tightness on Indian physiotherapy students with equal sample of male and female is the purpose of this article. This study infers that there is a higher prevalence of hamstring tightness is equal in both the male and female and also comparing to male higher hamstring tightness is witnessed among female physiotherapy students. The study conducted by DipeshThakur et al on hamstring length in both gender among college students concluded male subjects had tightness in left and female in right side. Another study by Jonathan M labovitz et al stated that role of hamstring tightness in plantar faciitis concluded that decreased hamstring tightness significant role on presence of plantar fasciitis. There are many sports research articles that states hamstring tightness is cause for atheletic injuries and a preseason flexibility program may decrease injuries in male athletes. In another study by Bhagyashree K. Koli et al concludes prevalence of hamstring tightness among college going students is high in the age group of 18 -25 but the study had majority of female participants. A study done in a College of physiotherapy, Gujarat with 60 participants concluded that there was significant difference of hamstring flexibility between

participant having low back pain and normal individual. Thus this study has evaluated the prevalence of higher is equal in both the male and female. This is due to lack of physical activity and increase in adapting the sedentary life.

Limitation of the study

The sample size of the study included with equal number of male and female .The further study can be done by providing appropriate physiotherapy management and evaluate the physical performance and quality of life among college students.

CONCLUSION

The study concludes that there is an equal prevalence of developing hamstring tightness in both male and female of young population. Hence increased physical activity is advised to prevent the musculoskeletal disorders .static and dynamic stretching can relieve Hamstring tightness.

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SP-29

YOGA VERSUS EXERCISE THERAPY IN MIDDLE AGED INDIVIDUALS SUFFERING FROM ACUTE AND SUB ACUTE LOW BACK PAIN

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ABSTRACT

To compare the effectiveness of yoga therapy with exercise therapy in middle aged individuals suffering from low back pain. 30 patients with acute and sub-acute low back pain were selected for the study. They were assigned into two groups received yoga therapy and exercise therapy in a randomized fashion. Both females and males in the age group of 30 to 45 with acute and sub acute low back pain were selected for the study. Patients with low back pain with neurological deficit, chronic low back pain, low back pain with spinal deformities and Disc prolapse has been excluded for the study. The objective of this study is to compare the effectiveness of yoga and exercise therapy on low back pain among patients approached the hospital in Annamalai University. The study design is Randomized controlled trial. Group A consists of 15 subjects, treated with yoga therapy and group B consists of 15 subjects treated with set of exercises. Exercise therapy and yoga therapy was carried out for 30 minutes for 5 days in a week and duration of the treatment program has gone for 8 weeks. No subjects involved themselves in any treatment or systemic training program which might have reflected on the results. Before and after the treatment Oswestry Disability index and Schober's test were administrated, scores obtained and statistically analyzed. The mean score of flexibility and disability in Group A practiced yoga postures were 3.866, 4.133, and 3.866, 4.133. The mean score of flexibility and disability in Group B practiced back exercises were 38.32, 34.50 and 3.866 and 4.133 respectively.

KEYWORDS: *Yoga, Exercise, Oswestry index, Schober test, Back pain*

INTRODUCTION

Pain adds rest unto pleasure and teaches the luxury of health. Pain is not a simple affair of an impulse travelling at a fixed rate along a nerve. It is a conflict between a stimulus and the whole individual. The lower back is particularly vulnerable area for discomfort since it supports the entire weight of the body. Low back pain can be caused by variety of factors including poor posture, pregnancy, stress, compression of nerve roots and many others. This lead to joint degeneration, ligament sprain and muscle strain. But most of the causes cannot be traced to specific definable cause. This leads many back pain sufferers to seek out alternative treatment everything from massage, exercise acupuncture to min body therapy. Hence the study attempts to highlight the importance of exercise therapy and yoga therapy through simple postures and stretches. Exercise is regarded as safe therapy for individuals, prescribed with the goals to improve back strength and flexibility, to reduce the intensity of pain and percentage of disability. The mean scores of flexibility of spine in both group lies the same and the disability scores shows mild difference between the groups. Hence there is no significant difference observed before and after intervention between the groups underwent yoga and exercise based therapy. And Yoga is an excellent therapy to relax the muscles, nerves are calmed, anxiety is decreased, immunity is heightened and healing is enhanced. These entire can greatly improves one's ability to deal with the symptoms and causes of low back pain.

METHODS

The objective of this study is to compare the effectiveness of selected yoga asana and exercise therapy on patients with low back pain. The subjects with acute and sub acute low back pain were examined by competent physician and subjects were selected on the basis that they would not suffered from any contraindication owing to the administration of yoga asana and exercises. Thirty subjects with acute and sub acute low back pain were selected with the age ranging from 30 to 45 years .Group A consists of 15 subjects treated under yoga therapy and Group B consists of 15 subjects treated with set of exercises. Both groups underwent treatment program for 30 minutes. Group A has been prescribed common yoga asana by experts in the yoga field such as Trikonasana, Vrkshasana, Vajrasana, Ustrasana, Shashanka asana, Ardhamatsyendrasana, Bhujangasana, Dhanurasana, Makarasana, Pawanamukta asana. After consulted with the physician, Back school exercises has been selected for the treatment program which includes hip cross over, hip stretch, thigh stretch, sit up straight, wall sit, prone frog, buttock stretch, cobra, hip stretch. Before and after 8 week program of yoga and exercise program outcome measures were administrated to compare the effects of yoga and exercise program. Oswestry disability index is used to obtain the scores which indicates the percentage of disability of patients with low back pain. And schobers test was administrated to know the available range of motion, the scores were obtained from both group. Pre and post treatment scores were statistically analyzed.

RESULTS

The scores thus obtained were analyzed statistically by independent 't' test. In this study, sample method is used i.e. a few units of population are studied, we take sample from a population for the following: 1. for estimation, 2. for test of significance. The purpose of estimation is to find the values of the population using probability level i.e. to what extent our decision is correct, for that we use 2 levels of significance i.e. 0.05 and 0.01level. Here the sample size is 30 so't' distribution is used, the tests based on this distinction are small sample test. The tabulated value at 0.05 level is 1.70, the final tabulated value in Group A is 4.62 and 2.08 and the final tabulated value in Group B is 1.045 and 0.6.

DISCUSSION

Data analysis was made by comparing the mean scores of disability and flexibility of spine in both group A and group B and to test the significance between the groups, "t" distribution was used. The mean scores of disability in patients before and after yoga therapy is 3.866 and 4.133 respectively. The mean scores of flexibility for the group involved in yoga therapy, before and after treatment is 3.866 and 4.133 respectively. The mean scores of disability in patients involved in exercise therapy is 38.32 and 34.50.The mean score of flexibility for the same group of patients before and after treatment is 3.866 and 4.133 respectively. Because of smaller size i.e. 30 and smaller duration of study, it is unable to prove the significance between the variables and between the two therapy. This study recommends, had the treatment duration been longer, scores would have been proved significant in the variables selected for the study. Also the treatment been given larger population with low back pain would show significance between two therapy.

Table 1

Computation of t – ratio for Disability scores Before and After Yogasanas for low back pain

Mean		Difference between the mean (X – Y)	Standard error (s) of difference between the mean	t-ratio
Before Yogasana (X)	38.93	5.19	3.086	4.62
After Yogasana (Y)	33.74			

Table 2
Computation of t – ratio for Disability scores Before and After Exercise Therapy for low back pain

Mean		Difference between the mean (X – Y)	Standard error (s) of difference between the mean	t-ratio
Before Exercise Therapy (X)	38.32	3.82	4.89	2.08
After Exercise Therapy (Y)	34.50			

Table 3
Computation of t – ratio for Flexibility measurement Before and After Yogasanas for low back pain

Mean		Difference between the mean (X – Y)	Standard error (s) of difference between the mean	t-ratio
Before Yogasana (X)	3.866	-0.267	0.69	1.045
After Yogasana (Y)	4.133			

Table 4
Computation of t – ratio for Flexibility measurement Before and After Exercise Therapy for low back pain

Mean		Difference between the mean (X – Y)	Standard error (s) of difference between the mean	t-ratio
Before Exercise Therapy (X)	3.866	-0.2	0.78	0.69
After Exercise Therapy (Y)	4.066			

CONCLUSION

Disability scores and flexibility measurements at pretreatment and post treatment were calculated in both group A and group B. In group A and group B disability and flexibility measurement remains the same in most of the patients in both groups. The mean scores of disability in group A and group B shows mild difference before and after treatment hence there is significant difference in the disability scores. The mean scores of flexibility of spine in both the group lies the same and the disability scores shows mild difference between the groups. Hence there is no significant difference observed before and after intervention between the groups underwent exercise based therapy and yoga therapy respectively.

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SP-30

ASSESSMENT OF EFFECTS OF HIP JOINT THRUST EXERCISE ON LUMBAR PAIN, ROM AND HIP JOINT FUNCTION: A LUMBOSACRAL JUNCTION DYSFUNCTIONS PROSPECTIVE CASE REPORT.

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ABSTRACT

BACKGROUND: Low Back pain and associated disabilities have been reported to be among major public health concerns by World Health Organization due to its increasing prevalence and associated costs in Hundred Billion of USD among the working-age population. Lumbar spine and pelvic dysfunction have been reported to be interrelated through different Biomechanical models by means of vertical compression stresses and shear forces. This is explained by the fact that dysfunction of any joint close to the spine will affect the alignment and symptoms in the lumbar region. Interventions to treat lumbar and manage low back pain and sacroiliitis include exercises and those acting on multiple joints have been proven to be effective. Hip thrust exercises have the potential to improve ROM, muscle performance, pain reduction, and overall improved function. However Hip thrust has been attempted in athletic injury management suffering from the above-described problems but in general population, it was rarely considered as a rehabilitative option toward improving performance in Activities of daily living. *AIM AND OBJECTIVES*: To assess the effect of hip thrust exercise on lumbar and pelvic pain and disability. To assess the impact of Hip thrust on the kinematics of lumbar region. *MATERIALS AND METHODS:* The 27 years old male, a patient diagnosed with diffuse disc bulge L4-L5, Reduced left sacroiliac joint space by MRI, treated with Hip thrust exercises active and resisted exercises with Barbell (Barbell hip thrust), 3-4 sessions per week, for a period of 2 months. Oswestry Hip Disability Questionnaire was used, Goniometry (universal goniometer) was used to assess hip ROM and tape measure to assess Lumbar region motions, pre and post-tests were used. *RESULTS:* The patients reported improvements in terms pain NPRS from 6/10to 1/10 ; Disability from 16% to 4% on OHPDQ. As well as measurements in the performances of the hip exercises reported improved ROM lumbar region with a difference of 9 cm. *CONCLUSIONS AND RECOMMENDATIONS:* The Hip thrust exercises may be used in the management of lumbo-pelvic dysfunctions especially in patients with degenerative disc diseases and sacroiliac disorders with cautions respective to age. However large-scale studies with a larger population are needed to confirm the theory behind the effect of Hip thrust exercises in the young and young adult population.

INTRODUCTION

Pelvic bridging exercise is considered to be the most researched among rehabilitation exercises in the management of the lumbar and pelvic dysfunctions. This can be explained by the factors several exercises modifications based on pelvic bridging were suggested including American hip thrust exercise.[1,6] Hip thrust exercise has been advocated to have an impact by means of reducing pain and disability among individuals suffering from low back pain , sacroiliac joint dysfunctions and hip joint related problems. The most effects highlighted by researchers is the ability of the exercise to activate gluteus maximus and relaxation of the hamstring muscle through which biomechanical models show to affect the lumbar, hip and sacroiliac joint causing different impairment and discomfort.[1,5,6] According to Yoo (2015) in his study on a modified pelvic bridge in Korea, stated that although the exercise have benefits, some unwanted excessive movements such as anterior pelvic tilt, and low lumbar and thoracic excessive extension. Other authors reported that decreased activity of gluteus maximus is without a doubt a contributor to impaired stability and function of the low back region, SI joint and the hip. Also as Gluteus weakness is commonly associated with hamstring tightness as a compensatory reaction in the muscular kinetic chain the pelvic bridging may play an excellent role in the reducing the problem.Not only pelvic bridging and its modifications are known to have an impact on lumbopelvic dysfunctions but are also prerequisite tasks for mobility and trunk stability by which most of

the functional activities rely on.[3,4] So although different studies were done still there is a need to find out the effects of the hip thrust exercise clinically by applying on individuals suffering from lumbopelvic and sacroiliac dysfunction in order to establish treatment guidelines and dosage specifically to the exercise.

METHODOLOGY

CASE DESCRIPTION

PATIENT HISTORY AND REVIEW OF THE ASSESSMENT

The client was a 27 year-old male, right hand/arm dominant, with a height of 1.80 m and weight of 75 kg. His symptoms started being noticed approximately 5 years before being evaluated for physical therapy. He was referred to physical therapy by an orthopedic surgeon who diagnosed him with left Sacroilitis with Bilateral Hamstring tightness. No medications prescribed except trying exercises in the gym without physical therapy or medical supervision. He has no surgical history of manipulations under anesthesia or surgery on remembers having a bike accident when he way young. He experienced a sudden tightness and discomfort in his lowback and Right posterior pelvis (at the SIJ) when he was lifting heavy weight from the floor, he also has worsening symptoms with an attempt to bend forward touch his toes or stretching his hamstring muscles. He is an active student so his symptoms hinder him from exercising adequately and managing his daily life activities requiring bending and lifting. During his visit to SRM Orthopedics department, his orthopedic surgeon requested MRI revealed Right Chronic sacroilitis, it revealed no abnormalities/fracture in the lumbar region. Further lab screening showed no signs or symptoms indicative of a possible underlying serious pathology including sciatica, piriformis syndrome, cervical disc disorders/radiculopathy, muscle power deficits/rotator, and tendonitis/bursitis. The patient complained of constant tightness and discomfort in his left shoulder. The patient's goals for physical therapy was to return to his maximal level of function such as doing gym, lifting weight, bodyweight training and improved quality of life in his daily life as a student.

EXAMINATION

The patient initially received a physical therapy evaluation that showed positive sign for sacroiliac dysfunction on FABER's test and resulted limitations to active and passive ROM in flexion, abduction, external rotation of the Right Hip with pain at the forced end range. The pain was examined by using the 100 mm visual analogue scale (VAS, 0 to 100). The patient completed the VAS questionnaire before the intervention, during the intervention, and after every 3 sessions of intervention at resting position. Both active Flexion, Abduction and external rotation of both hips (AROM) and passive ROM (PROM) were performed by the same examiner throughout the intervention period with FABER's TEST. Measurements were performed in supine with lower limb straight on the couch the body stabilizes the proximal lumbar spine joints. Within the international classification of functioning, disability and health (ICF) framework, the constructs of "activity limitations" and "participation restrictions" were examined by using the Oswestry Hip Pain Disability Questionnaire before and after the intervention.

BASELINE ASSESSMENT

At the first day of admission, the patient had moderate levels of pain, with the VAS score being 60. Compared with the mean (SD) normative values, he had limited Right hip AROM in flexion (45°; normative value, 75°), abduction (50°; normative value, 75°), external rotation (45° normative value, 70°). Secondly he had limited hip PROM in flexion (55°; normative value, 140°), abduction (65°; normative value, 75°), external rotation (57; normative value, 70°). For the HPDQ for testing activity limitations, disability score of 28/50.

INTERVENTIONS GOALS AND TRAINING PROGRAM

The immediate goals of the intervention strategy were to improve the patient's Hip ROM and , and improve comfort levels, activity limitations and restricted hip function. The patient's long-term goal was to participate in daily activities at his maximal level of independence. After the examination, direct intervention using Active and resisted Hip thrust was initiated. The patient attended 30 supervised sessions over a period of 10 weeks (three times per each week). The intervention started with an informative and explanatory session, and was applied for 20 minutes per session where some corrections may be needed and safety precautions. Before performing weight resistance the patient performed the movement for the first week without weight to ensure the mastery of the movement components and for safety purposes. The first exercise the patient assumed the supine position comfortably with the upper and middle thoracic spine

supported on a bench and hips aligned in neutral 0 degrees, with knee bent at 90 degrees. The patients moves his instructed to lower slowly the buttocks toward the floor as much as he can in his tolerance. For the resistance the barbell was applied horizontally bellow both ASIS and patient holds the bar with both hands then performs the same movement as it was done without resistance. Bridging exercises also were included after every weight resistance session. The patient was informed to stop at any time he experiences pain or any discomfort. Weight progressed from 8, 10, 15and 20 Kilograms. Another exercise the patient assumed the standing position with left knee 90 degree flexed , dorsum of the foot and anterior part of leg supported on the bench with Right lower extremity is in standing, then the patient simultaneously flexes his right knee up to 90 degrees and moves the left knee down vertically toward the floor as far as he can while maintaining his back straight. Before every session a 10 minutes general warm up was given consistently.

RESULTS

The findings of 6 weeks duration follow up is presented as follows:

Table 1

Weekly follow up on pain and lumbar movements NPRS (Numerical Pain Rating Scale) and Lumbar Range of Motion.

	NPRS/10		LUMBAR FLEXION/cm	
No of weeks	**PRE**	**POST**	**PRE**	**POST**
Week 1	6	4	24	26
Week3	4	3	26	26
Week4	3	3	26	30
Week 6	3	1	30	33

Based on the table 1: The patient improved in terms of pain from 6/10 (NPRS) by week 1 to 1/10 (NPRS) by week 6. Range of Motion improvements was reported from lumbar flexion from 24 to 33cm with a difference of 9cm in the same period of 6 weeks.

Table 2

Oswestry Hip Pain Disability Questionnaire (OHPDQ) records for 6 weeks of follow up

Disability And Functional Outcome		
Items	**PRE**	**POST**
Intesity	1	0
Pers care	1	0
Lifting	1	0
Walking	0	0
Sitting	1	1
Standing	1	0
Sleeping	0	0
Sex life	0	0
Social life	2	1
Travelling	1	0
Total/50	8	2
HIP %	16	4

Table 2 shows that on 10 items of OHPDQ, the disability reduced from 16% to 4% which shows a significant improvement from hip thrust exercise.

DISCUSSION

Based on findings the hip thrust exercise is an effective approach in the rehabilitation of lumbosacral junction including Lumbar disc related diseases, low back pain, sacroilitis and hip problems. This can be explained by outcomes obtained during the study such as reduced pain, improved ROM and minimized

disability. Other several studies; Zweifel et al 2017, Andersen et al 2018, reported improvement in performance and improved muscle function respectively. This supports the hypothesized assumption that hip thrust exercise could be beneficial dysfunction of lumbosacral joint. The current findings confirmed improved function and reduced disability scores after hip thrust exercise intervention. Others study by Jonely et al 2015, conducted with patient on sacroilities found that mobility of sacroiliac joint by means of mobilisations was successful to alleviate symptoms and function. This implies that hip thrust might provide mobility of sacroiliac joint and lumbar region mobility thus improved function. This is the first study to assess the effect of hip thrust clinically in patient with lumbosacral dysfunction.

CONCLUSION

Hip Thrust exercise is a promising treatment for the chronic lumbosacral junction dysfunction for the patient having pain, limitation in functional activity and ROM. But the results from the study should be analyzed with precaution. It is with this regard more large scale studies are needed such as Cohorts designs and Randomized controlled trials to ascertain its effects on the lumbo-pelvic dysfunctions and sacroiliac joint disorders. Based on Kinematics analysis of hip thrust exercise because of its hyperextension component to the lumbar region, it may have similarity with other low back exercises including McKenzie exercises, Solely it has advantage of resistance component which might make it more important. However this must be well investigated by advanced 3D motion analysis. Clinicians should analyze the findings with cautions because the findings are based on only one Young individual with inactive sacroilitis and lumbar disc related problems, therefore vey close precautions are recommended and advised to clinicians who might apply this exercise.

CONFLICTS OF INTEREST

The authors declare that there was no funding for this project received, hence no conflicts of interest in conducting the study.

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SP-31

PREVALENCE OF ATTENTION DEFICIT HYPERACTIVITY DISORDER AMONG PRIMARY SCHOOL CHILDREN (6 to 12 YEARS)

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ABSTRACT

Background: ADHD is a group of behavioural symptoms that includes inattentiveness, hyperactivity and impulsiveness. Attention deficit hyperactivity disorder (ADHD) is one of the most common neuro-psychiatric disorder in children. Hence, the prevalence of ADHD in primary school children was assessed in this study. Method: A cross sectional study conducted in Vels Vidhyashram School. Children studying in 1st to 3rd were taken for the study. Here, 51 students were taken for study using randomized sampling technique after obtaining permission from Principal of School. SNAP-IV Questionnaire was put forth to parents and teachers. Result: A total of 9/51(17.64%) children have diagnosed to have ADHD. Out of 9 ADHD children, 7 (21.21%) were female and 2 (11.11%) were female. ADHD manifested more in boys than girls in the ratio of 3:1. The prevalence was highest in the age group 6 and 8 years. Conclusion: The present study shows a high prevalence of ADHD among primary school children with a higher prevalence among the male than female.

KEYWORDS: ***ADHD, prevalence, children***

INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) is a clinical syndrome define in the Diagnostic and Statistical manual of mental disorder (DSM-IV) by high level of hyperactive, impulsive and inattention behaviour that begin during early childhood, are persistent over time, pervasive across situation and lead to clinically significant impairment [1]. Under the International Classification of Disease (ICD-10), classification system endorsed by WHO, the condition is referred to as hyperkinetic disorder, which is more restricted definition of the disorder describing a severe subgroup of patient with combined subtypes of ADHD [2]. As many as 3.5% of school age children have this disorder, characterised by inattentiveness, impulsivity, and hyperactivity which significantly impair social, academic or occupational functioning [3]. Most children with ADHD are diagnosed at school age, to be compared with other children by teacher, demonstrating behavioural difference [4] for diagnostic purpose, they are classified three subtypes: predominantly inattentive type, predominantly hyperactive/impulsive and combined type, that gather feature of the two previous (DSM-IV) [5]. Estimated from various countries including India have shown a prevalence of ADHD ranging 1-13% [6,9]. The major limitation in the previous studies are that the identification of ADHD was made from samples through clinically referred cases and not from the community, small sample size, failure to use definitive diagnostic criteria. There is only a limited source of information regarding the prevalence of ADHD in the Indian context. Hence, the current study aims at selecting primary school children from a community sample [7].

MATERIAL AND METHOD

Sample

The sample consisted of 51 primary school children aged between 6 to 12 years selected from Vels Vidhyashram as per the inclusion and exclusion criteria.

Tools

1. SNAP-IV Questionnaire (Swanson, Nolan, and Pelham questionnaire)

The SNAP- IV rating scale, based on DSM-IV criteria for ADHD, is psychometrically sound, easily accessible and simple to interpret. This comprehension (26 items) ADHD rating scale effectively discriminates between children with and without ADHD, and accurately predicts subtypes (inattention, hyperactivity/impulsivity and combined). The SNAP-IV is particularly helpful in making a differential diagnosis and includes items to gauge other DSM-IV disorders. This was rated by the parents and the teachers.

Methodology

This was a cross- sectional study conducted in Vels Vidhyashram, English medium school in Chennai. After obtaining permission from the school Principal of Vels Vidhyashram, the written informed consent form was given to the parents through the children. Samples were selected as per the inclusion and exclusion criteria. Simple randomization was carried out in selecting 51 students. This sample consisted of 33 males and 18 females. Children studying in one to third standard without past history of any significant medical illness were taken for this study. Children aged from 6 to 12 years were taken for this study. SNAP-IV questionnaires were given to the teachers and to the parents of the children to compare the teacher's and parent's rating score. Based on the score obtained as per the teacher and parents rating presence of ADHD was identified. Children who are foreigner, teacher or parents refused to fill the SNAP-iv Questionnaires were excluded and Subject who had only one SNAP-iv Questionnaire filled by either their teachers or parents were labelled incomplete and were also excluded. Statistical analysis was performed according to the score technique of the written scale.

RESULT

Prevalence

Out of 51 children studied, 9 children (male = 7 and female = 2) were found to have ADHD based on the SNAP-IV questionnaire score. So, the prevalence of ADHD among primary school children was 17.64%. Among 9 ADHD children, 4 were found to be Inattention type, 3 were found to be hyperactivity/impulsivity and 2 were found to be opposition/ defiance type [Fig1]. Out of 9 ADHD children, 6 and 3 were found to have mild and moderate symptoms of ADHD respectively [Fig: 2]

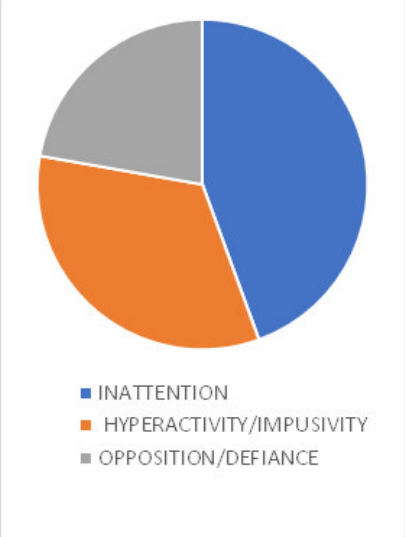


Figure 1
Prevalence of ADHD in primary school children.

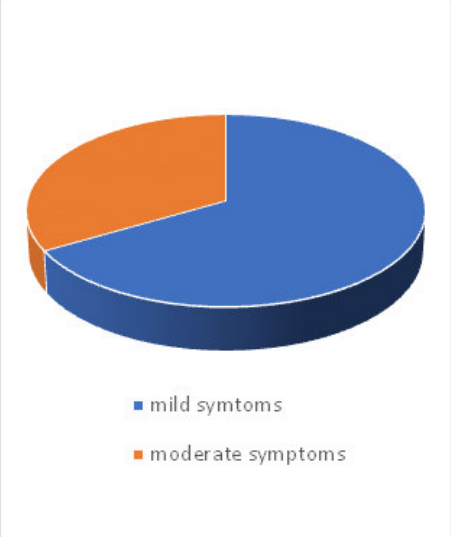
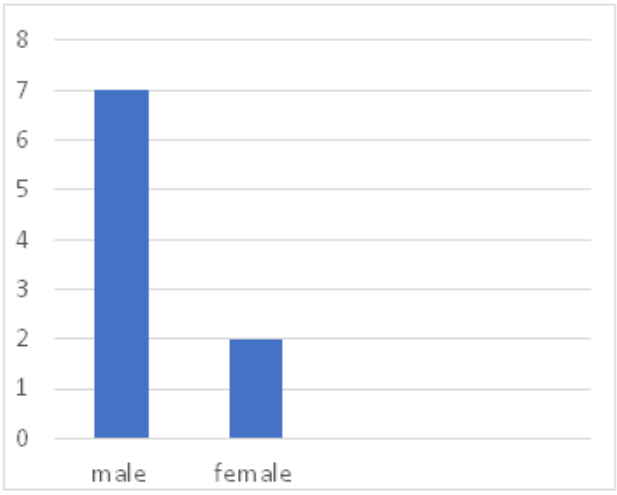


Figure 2
Prevalence of symptoms of ADHD.

Gender difference

ADHD was more prevalent in the male than female. Total number of males selected were 33, 7 of them had ADHD. Prevalence of ADHD in the males was 21.21%. Total number of females selected were 18, 2 among them had ADHD. This is shown in figure 3 Prevalence of ADHD in the female was 11.76%.

Figure 3
Prevalence of ADHD in males and females



DISCUSSION

The prevalence of ADHD in the community-based sample was found to be 17.64%. This is consistent with that of several studies which showed a wide range of prevalence rates between 2 to 18 % [7]. Males are more affected than females, in the ratio being 3:1. There was a maximum prevalence of ADHD in the children aged 6 and 8 years. Previous studies which have identified a higher prevalence of ADHD among children aged lesser than seven years.[7,10] There is significant difference between the Teacher's and Parent's rating score, the teacher's score being higher than that of the parents. This finding may due to the fact that children spend more time in the school and the teacher observe the children's behaviour more closely and parents may fail to identify the presence of ADHD in their children due to lack of knowledge about the symptoms of ADHD. Some of the Indian studies found a greater association of lower and middle socio-economic class with the occurrence of ADHD [6]. As the present study was conducted in an English medium school, majority of the parents were belonging to either upper middle or high class rendering a bias in assessment with the outcome. However, in this study could not found significant association between the socio-economic class and ADHD. There are several studies done to identify the prevalence of ADHD but the major limitation of these studies was that they involve a sample consisting of clinically referred cases. The advantages of this study over the previous studies is that It overcomes the above limitation as it consists of community sample. ADHD is a condition which is almost always associated with poor academic performance. Several studies have revealed that the development of anti-social co-morbid with ADHD. Early identification and intervention of this multi- factorial psychiatric condition in the children will help the children to improve their academic performance and prevent the development of co-morbid condition. ADHD is highly prevalent in children worldwide and its prevalence in adult is increasingly recognized. [8] ADHD is a common chronic and treatable disorder that affects at least one child in each class [11]. Early detection results in an excellent prognosis and it has a role in preventing the negative effects on the child's life, parent-child relationship and the community as well.

Limitations

1. Sample was taken only taken from one School.
2. Scale is not 100% diagnostic and that ADHD cannot be diagnosed without seeking clinical help.
3. Compare the distribution of ADHD among different socioeconomic status.

CONCLUSION

The strength of the present study is its community setting therefore referral bias has been eliminated. However, this study was performed amongst from a single school. In this study, prevalence of ADHD was found to be 17.64%. Boys have more prevalence than girls and Inattention type is the most common ADHD. So, early identification through mass screening program and directing appropriate intervention is done to have good prognosis. Epidemiological survey of ADHD is important in planning health services. Therefore,

further interview-based studies assessing the prevalence of ADHD as defined by DSM-IV criteria, are required in different parts of the country to get a clearer picture of its burden in India.

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SP-32

PREVALENCE OF MUSCULOSKELETAL DISORDERS AMONG WELDERS

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ABSTRACT

Background: Among welders the prevalence of work-related musculoskeletal disorders (WRMSDs) is unknown. So this study investigates the prevalence of musculoskeletal disorder among welders. Objective: The aim of the study is to find the prevalence of musculoskeletal disorder among welders. Study Design: Non-experimental design. Methodology: According to inclusion and exclusion criteria samples were collected. Prevalence of musculoskeletal disorder is assessed by using Nordic questionnaire. Result: The result indicates that musculoskeletal disorders are common among welders. Due to usage of awkward posture they develop neck, back and other joint pain. This results in reduced job performance, longer duration work incapacity and greater use of health care resources. Conclusion: It was concluded that there is high prevalence of musculoskeletal disorder among welders. The most common WRMSDs are neck, low back and shoulder.

KEYWORDS: ***Musculoskeletal disorders, Welders, Nordic Questionnaire.***

INTRODUCTION

Welders or lit operator is a tradesperson who specializes in fusing material together. Welders without a proper precaution can be dangerous and they mostly work with improper posture so they more prone to musculoskeletal disorders. Work-related musculoskeletal disorders an umbrella term is also labeled as repetitive strain injury (RSI), occupational overuse syndrome, cumulative-trauma disorder (CTD)[1] . These disorders are thought to be caused by exposures in the workplace[2]. This occupational health problem estimated to affect millions of workers around the world annually[3]. These are an important cause of disability and morbidity in many occupational populations[4]. In Musculoskeletal disorders the functions of the musculoskeletal system are disturbed or abnormal. The risk of workplace injury is related to the activity duration, and frequency. It is also necessary to frequently change the point of welding part of task execution time for position causing the risk of musculoskeletal disorders. Some studies have revealed that WRMSDs among Welders are caused, aggravated or precipitated through a undesirable force need to exert, using the uncomfortable hand grips, or adopt static awkward postures in the workplace coupled with continuous repetitive work and insufficient rest or recovery among them[4,5]. Due to this biomechanical strain of the body the return to the workplace of welders is critical problem[6]. The Nordic Musculoskeletal Questionnaire (NMQ) was developed from a project funded by the Nordic Council of Ministers. The Nordic Musculoskeletal Questionnaire can be used as a questionnaire or as a structured interview. The authors concluded this was acceptable in a screening tool[7]. So this study was aimed to study the Musculoskeletal disorders among welders where only fewer surveys were available and also only very few studies prevails to document the musculoskeletal injuries among welders. This study was needed because welders may get aware of high-risk areas for musculoskeletal disorders and to prevent the occurrence of musculoskeletal disorders in their lifetime by doing regular exercise programs and fit into their work. The purpose of this observational study is to findout the prevalence of musculoskeletal disorder among welders.

MATERIAL AND METHOD

A total of 50 Welders in and around Chennai with complaint of musculoskeletal pain were selected. Age of 25-40 years old men who employed for more than 5 years were participated in this study .Those with Any

recent surgeries or recent fractures, and underlying musculoskeletal diseases and deformities due to previous trauma, spine fractures, osteoporosis, arthritis, were excluded.

Procedure

The subjects were selected according to the inclusion and exclusion criteria. Informed consent received from the participant before participating in the study. Personal information name, sex, nationality, town, age and educational background were requested. The material used for the study is Nordic questionnaire. It is used to evaluate the reported case of musculoskeletal disorder. Subjects are explained with Nordic Questionnaire and its importance and requested to fill by themselves. In this questionnaire the whole body is divided into nine regions(neck, shoulder, elbow, wrist/hand, upper back, lower back, thighs/hip, knee and ankle/foot) and following criteria, 1. Have you at any time during last 12 month had trouble (ache, pain, discomfort, numbness) in?. 2. Have you at any times during the last 12 months been prevented from doing your work (at home or away from home) because of the trouble?. 3. Have you had trouble and pain at any time during the last 7 days?. True markings and response are encouraged from the participants . Obtained response is documented for statistical analysis.

DATA ANALYSIS

Table 1

Prevelence of Ache, Pain, Discomfort, Numbness in Different Region at any Time During the Last 12 Months Among Welders

Region	Prevelence (yes)
Neck	40%
Shoulder	31%
Elbow	29%
Wrist/hands	15%
Upper back	26%
Lower back	36%
Hip	24%
Knee	28%
Ankle	12%

Graph 1

Prevelence of Ache, Pain, Discomfort, Numbness in Different Region at any Time During the Last 12 Months Among Welders

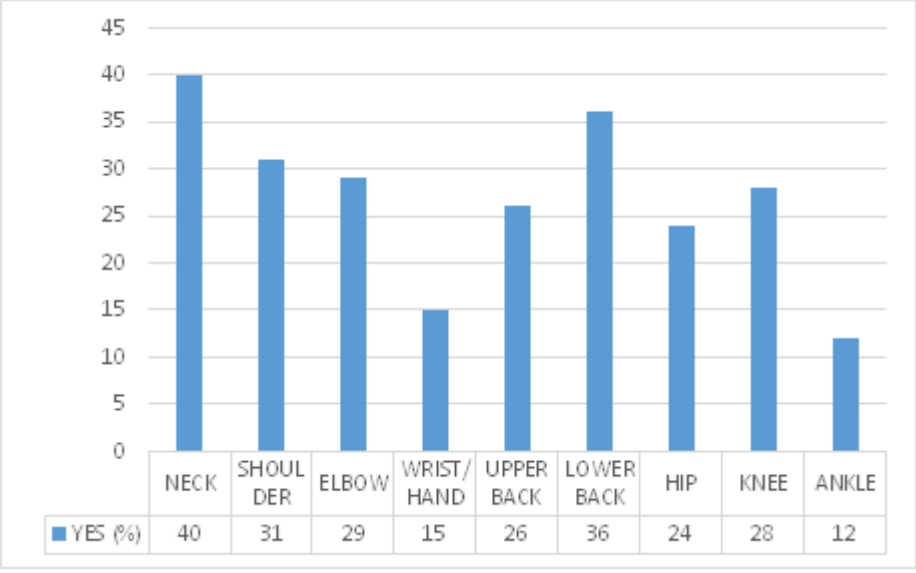


Table 2

Prevelence of Ache, Pain, Discomfort, Numbness in Different Region that his prevented from doing work During the Last 12 Months Among Welders

Body region	Percentage (yes)
Neck	38
Shoulder	37
Elbow	25
Wrist/hand	12
Upper back	13
Lower back	55
Hip	12
Knee	15
Ankle	8

Graph 2

Prevelence of Ache, Pain, Discomfort, Numbness in Different Region that his prevented from doing work During the Last 12 Months Among Welders

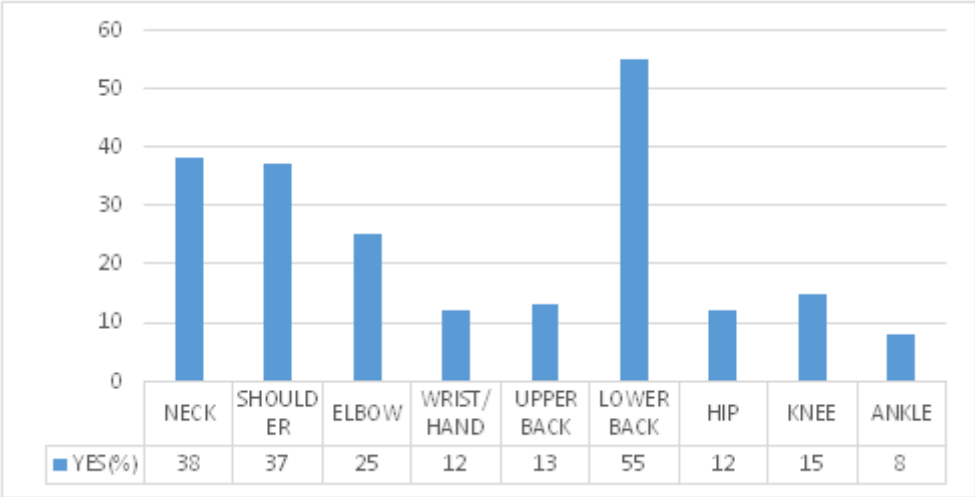


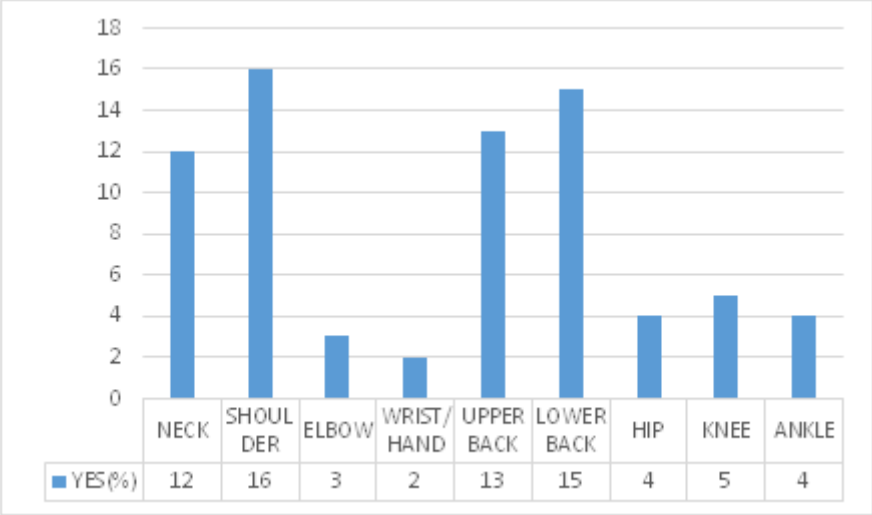
Table 3

Percentage of pain at any times during the last 7 Days among Welders

Body region	Percentage (yes)
Neck	12
Shoulder	16
Elbow	3
Wrist/hand	2
Upper back	13
Lower back	15
Hip	4
Knee	5
Ankle	4

Graph 3

Percentage of pain at any times during the last 7 Days among Welders



RESULTS

The above tables and graphs shows the pain involvement in various body region. Table 1 and Graph 1 show the prevalence of ache, pain, discomfort, numbness in different region at any time during the last 12 months among welders. Affected regions among 50 subjects are neck(40%), shoulder(31%), elbow(29%), wrist(15%), upper back(26%), lower back (36%), hip(24%), knee(28%), ankles(12%). Table 2 and Graph 2 show the prevalence of ache, pain, discomfort, numbness in different region that has prevented from doing work during last 12 months among welders. The affected regions among 50 subjects are neck(38%), shoulder(37%), elbow(25%), wrist(12%), upper back(13%), lower back (55%), hip(12%), knee(15%), ankles(8%). Table 3 and graph 3 shows the percentage of pain at any times during the last 7 days among welders. The affected regions among 50 subjects are neck(12%), shoulder(16%), elbow(3%), wrist(2%), upper back(13%), lower back (15%), hip(4%), knee(5%), ankles(4%).

DISCUSSION

The aim of the study was to find the prevalence of work-related musculoskeletal disorders among welders. Work related musculoskeletal disorder among welders is determined by Nordic questionnaire. The above Results showed that welders were affected by work-related musculoskeletal disorders. This study reveals the musculoskeletal pain is due to adaptation of awkward posture such as kneeling, stooping squatting, and lifting heavy material or equipment in work setting. During work setting maintaining neck in bent position and shoulder in raised position for prolong time result in increase in muscle tension and that create high prevalence of musculoskeletal disorders. These are precipitated by increased muscle tension, heightened awareness of normal or increased sensory nerve input, and anxiety. This disorder has both physical and psychological causes. The origins of musculoskeletal disorders are assumed to be multifactorial, with the implication that several risk factors can contribute to its development. Evidence shows that neck flexion and sitting are physical risk factors for neck pain among welders, whereas high quantitative job demands, low authority over decisions, low skill discretion, and poor social support by colleagues are important work-related psychosocial risk factors among them. Next to neck pain low back pain and shoulder pain is the most frequent complaint among welders. Manual labour as a source of shoulder pain has been of great concern for many decades. Many authors have postulated that an area of degenerative changes and necrosis in a critical zone of the rotator cuff, resulting from the ischaemia of chronic postural strain, or repeated minor trauma, as important aetiological factors (Codman, Wilson). A previous study concluded that localized muscle fatigue was common, among in- experienced welders, in the deltoid, trapezius (upper portion), and supraspinatus muscles during prolonged over- head work (Kadefors et al). It may be aggravated or perhaps even caused by largely static type of work with typical postures that are characterized by specific patterns of motion of the shoulder joint complex. This study supports the report that low back pain prevalent was more likely to result in reduced job performance (work efficiency), leisure activity,

longer duration of work incapacity, and greater use of healthcare resources (Hoogendroon et al). It was suggested that correction of awkward position, avoidance of static posture for long time, and control of repetitive speed arm movement can prevent the stress and strain for joints and muscles. Encouraging short rest period during continues work and proper exercises can reduce the musculoskeletal disorders. Ergonomic Education was given to the participants. Protective and Preventive Exercises are given to reduce further risks. Home care and advices taught to them.

CONCLUSION

The outcome of this study concluded there is high prevalence of musculoskeletal disorder and it has negative impact on job performance. Neck, followed by lower back and shoulder are more commonly involved body region among welders.

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SP-33

RESPIRATORY SYMPTOMS AND LUNG FUNCTION AMONG INDIAN SCULPTORS

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ABSTRACT

BACKGROUND: Sculptors are exposed to a variety of dusts through their work which increases the risk of developing respiratory symptoms and impaired lung function. The years of exposure to the dust plays a major role in the disease, however the person may remain asymptomatic for about 10-20 years of exposure. OBJECTIVE: To find out the respiratory symptoms and alteration in lung function among Indian Sculptors. METHODOLOGY: Study design is observational. 100 subjects between 25-60 years of age were selected. The spirometric values were measured using computerized spirometry and respiratory symptoms were found using St.George's Respiratory questionnaire (SGRQ). OUTCOME MEASURES: Inspiratory Reserve Volume (IRV), Expiratory Reserve Volume(ERV), Forced Vital Capacity(FVC), Forced Expiratory Volume (FEV_1), FEV_1/FVC, Peak Expiratory Flow Rate(PEFR), St George's Respiratory Questionnaire. RESULTS: The study shows that 43 individuals exhibited symptoms, 45 individuals had impact on their activity, 48 individuals have impact on their work and 49 subjects exhibited respiratory symptoms from SGRQ. Pulmonary function testing showed that all the measured volumes and capacities are reduced when compared to normal. CONCLUSION: The study concludes that the sculptors exhibit reduced Pulmonary function and Health Related Quality of Life (HRQL) and it is correlated significantly with the years of exposure.

KEYWORDS: ***omputerized spirometry, St.George's Respiratory Questionnaire, Sculptors, Silicosis, FEV_1/FVC, respiratory symptoms, pulmonary function.***

INTRODUCTION

Sculptor – known for their highly innovative and peculiar fine art work. A profession with progressing ideas for statues and bringing them to existence in a three dimensional figure by framing the materials together[1]. This kind of art form is commonly found all over the world, but in Tamil Nadu it is abundantly found in and around Mahabalipuram. Sculptors usually work with materials such as stone, marble, glass, metal, wood, ice or sand. Nowadays modern sculptures are even made out of lights, motion and sound.The dust particles from these materials may be inhaled by the sculptors and may cause changes in the breathing pattern and may also alter the lung functions as they are exposed to the dust for almost 8 hours a day for years. Breathing – the key to good health. Breathing is important because our cells constantly need a new supply of oxygen so they can produce energy. Without this vital oxygen, cellular function is impaired and damage or cell death is possible.When a person has breathing impairment he may face problems like difficult breathing, uncomfortable breathing, feeling like they are not getting enough air[2,3]. Breathing impairment is caused due to many reasons such as Inflammation, Infection, Coronary artery disease, Occupational hazards etc[12]. Among the occupational hazards, diseases from dust exposure such as Silicosis among the stone workers, byssinosis among cotton textile industry workers, baggossis among sugarcane workers, coal worker's pneumoconiosis among coal workers etc. There lies a threat in various occupation and one of the occupation prone to dust are sculpting.[9,10.14]. Sculptors working with stones such as quartz, sand stone, granite and onyx contain large quantities of free silica which cause silicosis when inhaled in higher concentrations substantially for a longer period of time[4].The poisonous property of silica destroys the lung tissue, when adequate amount of destruction takes place the elasticity of the lung is lost therefore the lung function is affected. Silica also has the potential to cause lung cancer depending on the tasks performed, the quantity of

dust they are exposed to and also the frequency of exposures[5]. Crystalline silica is a primary element of soil, sand, granite and various other minerals. Quartz is the commonest form of crystalline silica, the other two are forms are cystobalite and tridymide. All these three forms can be inhaled when the objects that contain crystalline silica are grinded, drilled or cut into pieces. Exposure to silica remains a serious threat in high risk jobs such as abrasive, blasting, stonecutting, rock drilling, quarry work etc[15,17]. There are three types of silicosis namely, (i). Chronic/Classic silicosis: It is the most common type and occurs after 15-20 year of moderate to low exposure of respirable crystalline silica. (ii). Accelerated silicosis – This occurs after 5-10 years of high exposure to respirable crystalline silica. (iii). Acute silicosis – This type of silicosis occurs after a few months or after 2 years of exposure to extremely high concentration of respirable crystalline silica[16]. Lung, which are the organs of breathing are responsible for the gaseous exchange in the body (bringing in oxygen from the atmosphere into our body and exchanging it with carbon-dioxide, which are released into the atmosphere) without which breathing is difficult.The lungs are continuously exposed to the danger from dust. Fortunately, the defense mechanisms which humans have, protects the lung by removing the dust particles from the respiratory system[7,10]. On the other hand, inhalation of excessive dust leads to disease.When the dust is inhaled, the nose acts as a reservoir and stops larger dust particles from entering the lung while smaller dust particles enter the lung[6]. So, while breathing the air reaches the alveoli, which is in the inner part of the lung along with the in-filtered dust particles, thereby causing changes in the lung function.The reaction of the respiratory system to the inhaled dust particles depends upon the place in which the dust particle has settled. If the irritant settles in the nose that leads to rhinitis or an inflammation of the mucous membrane. If the dust reaches the larger air passages inflammation of the trachea or the bronchi is possible. Different types of dust lead to various condition. As the sculptors are exposed to silica dust from the stones they are more prone to get one among the following such as fibrosis of the lung, lung cancer, silicosis, COPD, kidney disease, etc. The person suffering from the disease may remain asymptomatic for about 10-20 years after exposure[11,12].

METHODOLOGY

It is a non experimental study design. The study is conducted for 4 weeks in and around Mahabalipuram. 100 Male sculptors between 25-60 years of age with minimum two years of experience were included in the study. The subjects with conditions such as Neurological disease, Smoking, any cardiac conditions, uncontrolled Hypertension, Abdominal pain, Any history of recent surgery, Any recent attack of dyspnea, Malignancy and Recent fractures were excluded from the study.

Materials used

Computerised spirometry (Spiroexcel)
St. George Respiratory Questionnaire
Cotton
Sterilium

Procedure

Sculptors in and around Mahabalipuram were recruited based upon the inclusion and exclusion criteria. The purpose of the study and the procedure were explained to the subjects. Written informed consent form was obtained from each subject duly filled and signed. Participants baseline data was obtained. Prior to taking measurements the subjects were instructed about the usage of the lung capacity measuring instrument. In order to evaluate the lung function of the subjects a computerized spirometer (spiroexcel) was used. Prior to measuring the lung capacity, the participants are given motivation and confidence so that they could perform the test better. The participants were asked to tightly seal their mouth over the mouth piece. After the normal breath they were asked to take in a big deep breath until their lungs were filled up completely and thereafter asked to blow out harder and faster until the air in the lungs are completely emptied. For the measurement of Forced Vital Capacity(FVC) and Forced Expiratory Volume(FEV_1) the subjects were asked to take in a deep breath through their mouth and expire out forcefully. Peak Expiratory Flow was obtained from the FEV_1 and FVC manoeuvre. The graph was displayed in the computer as the patient blew and the resultant values were predicted as soon as the test ended. For checking the Vital Capacity(VC) the patients were asked to take in two normal breaths and then a deep breath (as large as possible) and then expiring it forcefully followed by

two normal breaths. As earlier the graph was shown in the computer and the results were predicted as soon as the test ends(i.e when the patient stops blowing).The lung capacity was measured 3 times consequently and the highest or the best score was taken into consideration. A rest period of 1 minute was given after each trial inorder to avoid muscle fatigue. St. George's Respiratory symptoms were obtained from the subjects by distributing the questionnaire to the subjects and asking them to fill the appropriate answers based on the symptoms they have due to sculpturing. The questionnaire targeted the four main things i.e. Symptoms, Activity and Impact. The scoring was done based on the answers given by the subject. The respiratory symptoms were determined based on the scoring. The data collected was entered into the SGRQ calculator and the values were obtained for Symptoms, Activity, Impact and the total score.

RESULTS AND DISCUSSION

Table 1 and graph 1shows the demographic details and mean values of Lung function and Respiratory symptoms among Indian Sculptors. Table 2 and graph 2 shows that 43 individuals exhibited symptoms, 45 individuals had impact on their activity, 48 individuals have impact on their work and 49 subjects exhibited respiratory symptoms. Table 3 shows the correlation of St. George's Respiratory Questionnaire with Years of exposure. In this the years of exposure correlates well ($p<0.05$) with the symptoms, impact and total score while it does not correlate ($p>0.05$) with the activity. The Symptoms correlates well ($p<0.05$) with the years of exposure, Impact, Activity and Total score. The Activity correlates well ($p<0.05$) with the symptoms, Impact and total score but does not correlate ($p>0.05$) with the Years of exposure. The Impact and total score correlates well ($p<0.05$) with years of exposure, Symptoms, Activity. The aim of the study was to find out the respiratory symptoms and lung function among Indian Sculptors (N=100). The study was performed as an observational study and only the workers who were exposed to the dust from the sculptures were enrolled. The workers baseline data and their years of exposure was noted. The Respiratory symptoms for 100 subjects was analysed through St. George's Respiratory questionnaire which had three main components namely: Symptoms, Activity and Impact. SGRQ is a highly valid scale of health status measurement exhibiting discriminative and evaluative properties[24]. The SGRQ total scores are expressed as percentage where 100 represents worst possible health status and 0 denotes the best possible health status of the individual. SGRQ scores were higher among older age group, respiratory patients and males[18,19]. The SGRQ total score correlated well with all the variables obtained from pulmonary function test[18]. Analysis of the various measures of lung volumes such as FVC is 1.84 when compared with the normal value of 3.43, FEV_1 is 1.34 when compared with the normal value of 3.2,FEV_1/FVC is 71.48 when compared with the normal value of 93.6, PEFR is 3.25 when compared with the normal value of 6.82, IRV is 0.59 when compared with the normal value of 3.3 and ERV is 0.56 when compared with the normal value of 1.0 showed that the lung function of the sculptors was reduced. The SGRQ Symptoms score is 24.85 which is in the range of COPD patients (22.55), Activity score is 10.95 which is in the range of healthy individuals (7.10), Impact score is 16.49 which is in the range of COPD patients (12.82) and total score is 16.08 which is in the range of COPD patients (18.18) indicate that the sculptors are exhibiting obstructive disorder[18,22]. The decrease in pulmonary function and quality of life are significantly related to the years of exposure to silica dust[17]. Previous studies have proved similar results as our study that the lung function in workers are affected due to the effects of smoking, exposure to quartz and silica dust. It has been identified for many years that the exposure to inorganic dust may cause reversible symptoms of cause and reduction in the lung function. Numerous studies have been done stating that inorganic dust alone is enough to cause chronic bronchitis[20]. A study done in California stated that the inorganic exposure among grape workers may cause a reduced lung function which is consistent with the restrictive effect on Pulmonary function. Several cross-sectional surveys have found that there is an increased rate of chronic bronchitis among non-smoking animal confinement workers[21]. It was analysed that among the 100 subjects, 57 of them did not show any symptoms and 55 of them did not have any disruption on activity and 52 of them had no impact. In the overall score it was found that among the 100 sculptors, 51 of them had no Respiratory symptoms while the remaining 49 showed some symptoms due to dust exposure. The years of exposure of the sculptors correlate significantly with the symptoms, impact and total score of the SGRQ whereas the activity of the SGRQ does not correlate significantly with the years of exposure. In the study published by the "American Journal of Respiratory and Critical Care Medicine" showed that the women who have worked as a cleanser consecutively for 20 years showed a decline in their lung function which was equivalent to the smokers who smoke 20 cigarettes a day over the same time period. The study said that the particles remain in the air for few hours even after

cleaning which travels deep into the lungs and causes infections and ageing of the lungs. The stone which the sculptors work with is granite which has 30-40 percentage composition of crystalline silica. The other substances which contain abundant amount crystalline silica are slate and sandstone. Inhalation of dust from crystalline silica causes silicosis which is a fibro-nodular lung disease, and exposure to crystalline silica excessively can cause various ill effects and the disease keeps progressing even after the exposure[25,20]. Therefore the years of exposure and the values obtained from the respiratory questionnaire was correlated and found that as the number of years increases the danger of respiratory problems also increases. The study reveals that in persons with less years of exposure to dust had no symptoms while the persons who had long exposures to dust showed some respiratory symptoms[23].

Figure 1
Checking pulmonary function test of the sculptor

Table 1
Lung function and pulmonary symptoms of indian sculptors

	N	Minimum	Maximum	Mean±Std. Deviation
Age	100	26.00	60.00	40.59±10.24
BMI	100	17.26	32.41	23.61±3.16
IRV	100	.02	2.76	.59±.61
ERV	100	.02	2.78	.56±.59
FVC	100	.47	4.87	1.84±.76
FEV_1	100	.10	3.96	1.34±.72
FEV_1/FVC	100	6.45	100.00	71.48±20.00
PEFR	100	.36	44.70	3.25±4.65
Symptoms	100	.00	100.00	24.85±35.05
Activity	99	.00	73.68	10.95±17.50
Impact	100	.00	96.81	16.49±27.63
Total score	100	.00	77.17	16.08±24.59
Valid N (listwise)	99			

This table shows the demographic details and mean values of Lung function and Respiratory symptoms among Indian Sculptors

Graph I

Pulmonary function test of sculptors n mahabalipuram

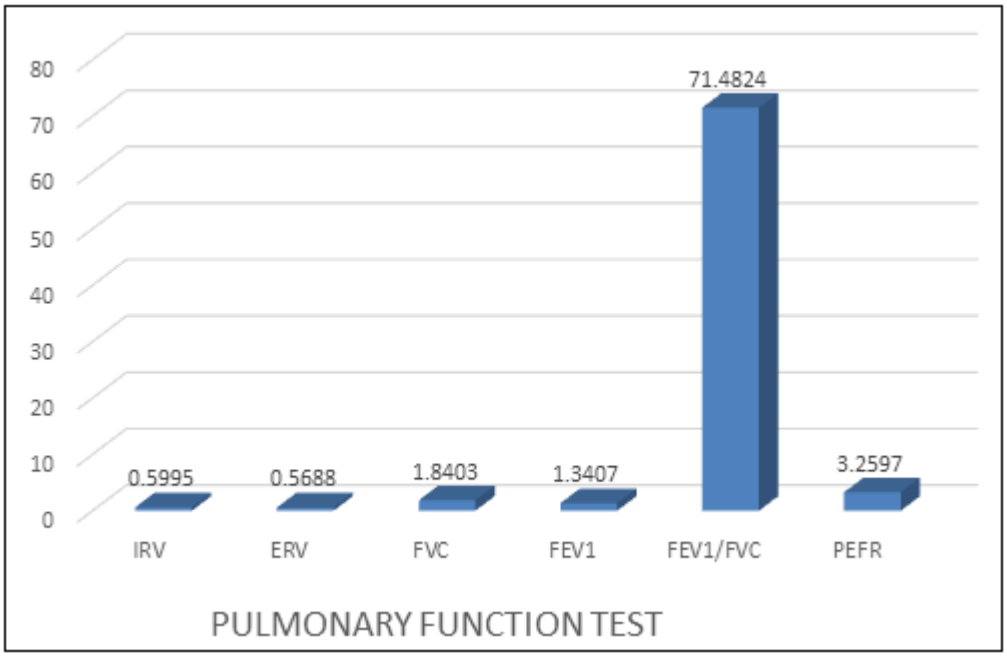

Table 2

Respiratory symptoms of Indian sculptors

Symptoms	**No symptoms**	**With symptoms**
	57	43
Activity	No impact	With impact
	55	45
Impact	No impact	With impact
	52	48
Total	No respiratory symptoms	With respiratory symptoms
	51	49

Graph 2

Values obtained from St. George's respiratory questionnaire

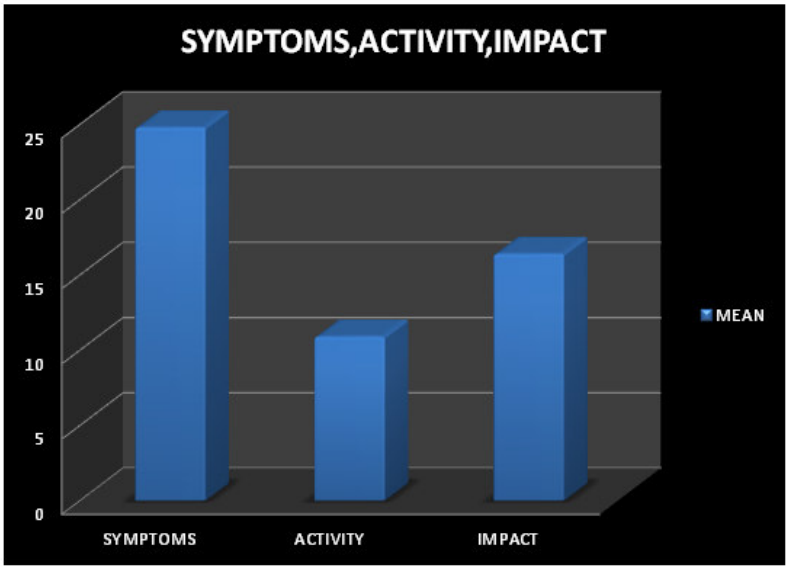

Table 3

Shows the correlation of St.George's respiratory questionnaire with years of exposure

Components		Years	Symptoms	Activity	Impact	Total score
Years of Exposure	Pearson correaltion	1	.531	.006	.477	.508
	P-value	-	.000	.949	.000	.000
	N	100	100	100	100	100
Symptoms	Pearson correaltion	.531	1	.206	.922	.953
	P-value	.000		.041	.000	.000
	N	100	100	100	100	100
Activity	Pearson correaltion	.006	.206	1	.278	.243
	P-value	.949	.041	-	.005	.015
	N	100	100	100	100	100
Impact	Pearson correaltion	.477	.922	.278	1	.986
	P-value	.000	.000	.005	-	.000
	N	100	100	100	100	100
Total score	Pearson correaltion	.508	.953	.243	.986	1
	P-value	.000	.000	.015	.000	-
	N	100	100	100	100	100

CONCLUSION

The study concludes that the sculptors' exhibit reduced Pulmonary function and Health Related Quality of Life (HRQL).

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CONFLICT OF INTEREST

Conflict of interest declared none.

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CORRELATION BETWEEN PHYSICAL ACTIVITY AND REACTION TIME IN TYPICAL YOUNG ADULTS -A PILOT STUDY

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ABSTRACT

Everyone performs physical activity in order to sustain life; physical inactivity is now identified as the fourth Leading risk factor for global mortality. Physical activity can be categorized in a variety of ways. A commonly used approach is to segment physical activity on the basis of the identifiable portions of daily life during which the activity occurs. On the other hand, certain studies have shown that an individual's reaction time can be valid indicator for the central nervous system's ability to receive and synchronize movement expressed through the peripheral nervous system. This cognitive motor connection has an important role in many of daily living including, but not limited to make quick decisions in dangerous situations, athletic abilities, prevention from injury and sustained autonomy with aging. Physical activity is known to increase blood flow and oxygen to the skeletal muscles and the brain, it was inferred that physical activity would also affect an individual's reaction time, since both skeletal muscle and the brain are separately associated with reaction time. To determine this correlation this pilot study has been done on the topic correlation between physical activity and reaction time in typical young adults. Study done on 20 typical young adults by determining the physical activity with International physical activity questionnaire (IPAQ-SF). And alternate hand wall toss test for reaction time and the descriptive data was evaluated using the SPSS software.

KEYWORDS: ***Reaction time, physical activity, alternate hand wall toss test, IPAQ, typical young adults.***

INTRODUCTION

Physical activity is defined as any bodily movement produced by skeletal muscles that require energy expenditure. Physical activity includes exercise as well as other activities such as part of playing, working, active transportation, house chores and recreational activities[1.] On the other hand Reaction time is a measure of how quickly an organism can respond to a particular stimulus. Reaction time will be affected by physical activity[2]. Physical activity helps to increase heart rate and improve circulation to your brain. When our brain is benefited with increased circulation, you are able to process information faster and more accurately, lending to faster reaction times. Physical activity is the discretionary component of energy expenditure and there is evidence that falling levels of physical activity are contributing to the obesity epidemic. Physical activity in children is related to developmental stage, is reduced with increasing age and is influenced by parental physical activity[3]. Reaction time, defined as being the time between the application of a stimulus and the beginning of an organism's response to it. Reaction is a purposeful voluntary response to external stimulus. There is certain time period between application of stimulus and appropriate motor response. Reaction time is the elapsed time between the presentation of sensory stimuli and the subsequent behavioral response[2]. Reaction time has been widely studied, as its practical implications may be of great consequence, e.g. a slower than normal reaction time while driving can have grave results. Many factors have been shown to affect reaction times, including age, gender, physical fitness, fatigue, distraction, alcohol, personality type, and whether the stimulus is auditory or visual[5]. Because exercise is known to increase blood flow and oxygen to the skeletal muscles and the brain, it was inferred that exercise would also affect an individual's reaction time, since both skeletal muscle and the brain are separately associated with reaction time. There are some stimuli that should be responded to and others that should not be responded to, in choice reaction time there are multiple stimuli and each stimulus requires different response[6]. It is usually expressed in milliseconds. The International Physical Activity Questionnaire (IPAQ) developed as an instrument for cross-national monitoring of physical activity and inactivity is used for assessing physical activity and an alternate hand wall toss test is used to test the reaction time. AHWT test is one of the training that has been modified from simultaneous ball throw training[7].

MATERIALS AND METHODS

Methodology of the study

Study design used was observational study, and the study setting was JSS College of Physiotherapy Mysuru. And the Participants who participated were Individuals with age between 18 to 40 years. Sampling technique used was Convenience sampling with a sample size of 76 participants (but in this pilot study only 20 participants were included) which includes students and lectures from JSS College of Physiotherapy within the age group. The sample size were generated using G*power 3.0.10 software. The inputs were Effect size f = 0. 6Alpha error problem, $\alpha = 0.05$ Power, $(1-\beta) = 0.8$, Allocation ratio N2/N1 = 1, and therefore the total sample size was 76. And the study duration was 6 months.

Selection criteria

Inclusion criteria includes typical young adults 18-40 (Erikson's theory) both male and female participants. Exclusion criteria include any visual defects, auditory defects, any neurological diseases, any injury to the dominant hand and any recent eye or ear surgery. Outcome measures are IPAQ questionnaire SF and the Alternate hand wall toss test. Based on the score of the number of successful catches in 30 seconds.

Table 1

Ratings	Score (in 30 seconds)
Excellent	>35
Good	30-35
Average	20-29
Fair	15-19
Poor	<15

Materials required were IPAQ SF Questionnaire in Laptop, Tennis ball, Inch tape, marking tape, Smooth wall and Stop watch.

Experimental Details

Procedure

Permission from the JSS College of Physiotherapy was taken for the study. The students of the college were informed with needed instructions and consent forms were given to the students who were willing to participate. All the students underwent the same program. IPAQ SF 7 were given to all the participants and asked them to read it thoroughly and fill the questionnaire. After filling the questionnaire the participants were asked to do the alternate hand wall toss test. i.e., a specific area with smooth wall in JSS College of Physiotherapy was selected to do the test. Subjects stand, facing the wall with two metres behind a retaining line and hold a tennis ball (2 meters was marked on the floor) whether on the right or left hand. Subjects' knees should be slightly bent with the feet shoulder width apart. At the starting signal, the subject tosses the tennis ball in an upper-arm motion from the right hand against the wall and catches it with the left hand. Same goes if it is thrown with the left hand, it should be caught with the right hand. The ball is thrown with this movement repeatedly as many times as possible in 30 minutes and the numbers of successful catches are recorded. Meanwhile if the subject missed the catch and the ball falls down in between the test, he/she can pick up the ball again and continue the test. The components measured were number of successful catches in 30 seconds. The test results may be skewed if the subject 'flukes' a few catches, so the subject have done a trail test first.

RESULT

After data analysis it was found that the correlation between physical activity and reaction time is statistically significant. Fair correlation is found between physical activity and reaction time.

Case Processing Summary

Crosstabs

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Level of physical activity* reaction time	20	100.0%	0	0.0%	20	100.0%

Level of Physical activity* Cross tabulation

Count

		Reaction time				Total
		Poor	Fair	Average	High	
Level of physical activity	Low	4	0	0	0	4
	Moderate	5	0	3	0	8
	High	0	1	5	2	8
Total		9	1	8	2	20

Directional Measures

			Value	Asymp. Std. Error*	Approx. T[b]	Approx Sig.
Nominal by Nominal	Lambda	Symmetric	.435	.159	2.182	.029
		Level of physical activity Dependent	.417	.211	1.601	.109
		Reaction time dependent	.455	.150	2.582	.010
	Goodman and Kruskal Tau	Level of Physical activity Dependent	.360	.054		.034[C]
		Reaction time dependent	.360	.068		.002[C]

a. Not assuming the null hypothesis, b. Using the asymptotic standard error assuming the null hypothesis, c. Based on chi-square approximation

DISCUSSION

Certain studies have shown that an individual's reaction time can be valid indicator for the central nervous system's ability to receive and synchronize movement expressed through the peripheral nervous system. This cognitive motor connection has an important role in many of daily living including, but not limited to make quick decisions in dangerous situations, athletic abilities, prevention from injury and sustained autonomy with aging. This Pilot study was done on 20 typical young adults by determining the physical activity with International physical activity questionnaire and alternate hand wall toss test for reaction time. Students of JSS College of Physiotherapy were taken for the study, students were asked to come to the selected area in the college premises for the test after college hours for data collection. Those students were asked to fill the consent form and they were given the IPAQ questionnaire and the procedure was been explained as to throw with one hand and catch it with the other hand. And the numbers of successful catches within 30 seconds were been noted and recorded. Depends upon on the number of successful catches each student's performance was graded with comment table of alternate hand wall toss test. Those results was entered in excel sheet and using SPSS software correlation of physical activity and reaction time was done, Goodman and Kruskal's lambda was used as the statistical test and data was interpreted. Result was statistically significant. It is suggested that future studies can be done with all components of reaction time (Visual, auditory and cognitive) and level of physical activity.

CONCLUSION

It can be concluded that the correlation between physical activity and reaction time is statistically significant and moderately correlating.

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SP-35

CORRELATION OF BREAST SIZE ON MID THORACIC PAIN (T4 – T7) AMONG POST NATAL WOMEN

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ABSTRACT

BACKGROUND: Usually literature supports the mid thoracic pain may be due to bad posture but only few literature have documented the influence of increased breast size over mid thoracic pain and no studies had documented its correlation in postnatal women where there is increase in breast size for breast feeding. OBJECTIVE: To find out the correlation of breast size on mid thoracic pain (T4 – T7) among postnatal women. STUDY DESIGN: Non experimental design, observational type. PROCEDURE: 100 subjects were conveniently selected based on Inclusion and Exclusion Criteria. Breast size is measured at three levels – above the breast level, at the nipple level, below the breast level. Measurement is taken with the help of inch tape. Postural correction and breast feeding techniques were taught. RESULTS: The result shows that there is no correlation between mid-thoracic pain and the size of the breast, p value is > 0.05. CONCLUSION: The study concludes that there is no correlation between upper back pain and the size of the breast in postnatal women.

KEY WORDS: ***Breast size, mid thoracic spine pain, Post-natal women.***

INTRODUCTION

The breast lies in the superficial fascia of the pectoral region. It divided into four quadrants (upper medial, upper lateral, lower medial and lower lateral). A small extension of the upper lateral quadrant called axillary tail of spence, passes through an opening in the deep fascia and lies in the axilla. The opening is called foramen of langer. Breast extends vertically from second rib to sixth rib, and horizontally from sternum to the mid axillary line[1]. The breast consists of connective tissues, mammary glands and associated with skin. Superficially anterior to the pectoral muscles the mammary glands are present and they are modified sweat glands. The mammary glands consist of series of ducts in anterior thoracic wall and the milk is produced from lobules, lobules are smaller structures of the each lobe, they are 15 to 20 sections of lobes present. The milk passes through tiny tubes called ducts. All the ducts connect and form as larger ducts, eventually it is exist from the nipple. The nipple is surrounded by dark area of the skin is called areola[2,3]. In the breast due to increased production of hormones (oestrogen, progesterone and relaxin) it may become sensitive to touch and tenderness present in the breast during pregnancy. once the pregnancyoccurs the hormone production gears up immediately and it continuous to enhance throughout the pregnancy and total size of the breast increases. The effect of the progesterone helps in glandular milk producing cell development and breast alveolae development, the effect of the estrogen helps to increase the growth of breast ducts and level of prolactin to prepare breast for lactation. The breast weight increases approximately 400–800g during and after pregnancy[3].The symptoms most oftenly noticed during first trimester of pregnancy is breast and nipple tenderness. The breast tenderness subsides as pregnancy progress although it remains sensitive at the nipples[4]. The breast may become engorged, warm, full and painful[2], when lactation begins the milk production will be approximately 750 – 1050ml per day after two months from two months from theirpostnatal period[4]. The mid thoracic spine acts as an anchor to the rib cage. Mid thoracic spine is considered as the strongest in whole spine, but it may also cause the upper back pain (mid thoracic pain)[5, 6].The continuous need for the newborn to be held imparts adaptations throughout the spine. The most effect on the thoracic spine is because of engorged breast tissue, rounded shoulders, while lifting or carrying baby and un proper breast feeding position in postnatal women[6, 7]. The posture of the postnatal mother completely changes because of large bust size. The posture is completely compromised by excessive arching of the back and the protruding buttock [7]. This change in posture maintains the spine for a short period of time without producing difficulties to the spine such as back pain.If the tenderness, pain and stiffness is not treated, then it might lead to thoracic kyphosis in a course of time[8,9]**.** The other reason for thoracic pain may be lack of

enough support from surrounding muscles and rest of the body[9], (the surrounding muscles are pectoralis major and minor, serratus anterior, inter costal, infraspinatus, latissimus dorsal and levator scapulae)[5].it is difficult to maintain proper posture, even it can lead to any spinal problems or deformities. Some women being self-conscious about large breasts also make hunch forward position to hide their chest. So this study is designed to analyze if there is any association of breast size and thoracic pain for the betterment of the patients.

Aim of The Study

To find out the correlation of breast size on mid thoracic pain (T4 – T7) among post natal women.

Need for The Study

Mid thoracic pain is one of the most common problem in postnatal women due to increased breast size, we need to know the prevalence of correlation between breast size and mid thoracic pain among post natal women. Furthermore, there is very less awareness of increased breast size and mid thoracic pain among physiotherapist. So this study is done to bring better awareness and benefit to the post natal women. Moreover there are very few studies concentrating about increased breast size and mid thoracic pain among post natal women, hence this study is needed.

METHODOLOGY AND PROCEDURE

It was an observational study, convenient sampling was done from Department of Obstetrics and Gynecology, SRM College Hospital and Research center, Kattankulathur. Subjects aged between 20-35years, Primigravida women, Both vaginal-delivery and caesarean patients. Visual analogue scale score (4 –7), Breast size range (32-42 cm) were included in this study and the Patients who are not willing to participate in these study, Any pathology involving the breast, lung, thoracic and cervical spine, Medical problems such as cardio-respiratory diseases, Chest wall deformities are excluded from the study. Postnatal mothers (n=100) who fulfill the inclusion criteria were taken into study and subjects selected for this study are after two months from their postnatal period. An informed consent was taken from all the participants. The selected participants were explained about the study and its importance. The complete procedure was explained to all the participants. Based on the postural deformities or change in the posture due to improper positioning and feeding, the postural correction exercises were taught. Firstly, breast size was checked for all the participants with the help of inch tape, at three levels.

Above the breast level.

At the nipple level.

Below the breast level.

The subjects were checked whether they wore correct sized innerwear or not. The subjects were asked about the thoracic pain and it was documented with the help of VAS and McGill pain questionnaire. The correlation between thoracic pain and breast size was analysed with the help of statistics. Breast feeding positions and techniques were advised to all the participants.

Breast measurement – Above the breast level

Breast measurement - At the nipple level

Breast measurement - Below the breast level

DATA ANALYSIS

Data was analysed using IBM SPSS version 20.0 software. Pearsons correlation test was applied to assess the correlation between breast size v/s McGill pain questionnaire and breast size v/s VAS

Table 1

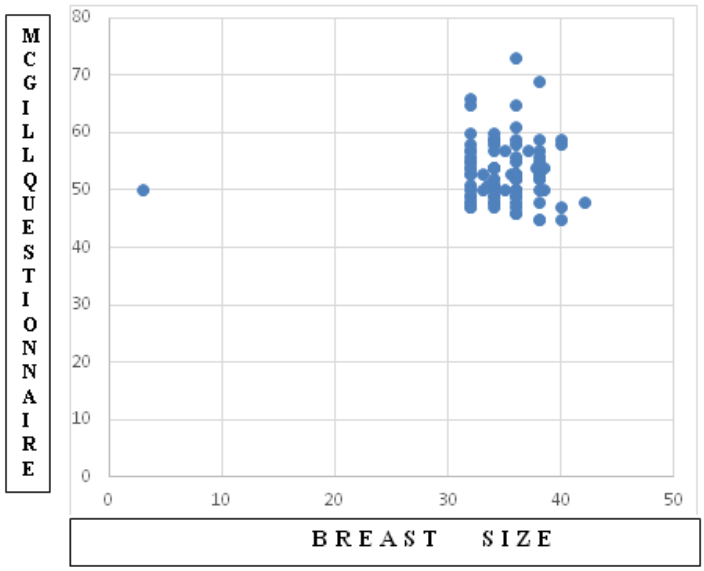
Cross Analysis Between Breast Size and Mid Thoracic Painamong Postnatal Women (N = 100)

Variable	N	Mean	df	Pearson correlation	Sig
McGill pain Questionnaire VS Breast Size	100	53.15 34.858	99	-.253	.102
VAS VS Breast Size	100	5.975 34.858	99	-.082	.418

P < 0.05* Table 1 shows that, the mean value of McGill pain questionnaire v/s Breast size 53.15, 34.858 and significant value of correlation is .102. The mean value of VAS v/s Breast size 5.975, 34.858 and significant value of correlation is .418. The table shows there is no significant correlation between Breast Size v/s McGill pain questionnaire and VAS, P value is greater than 0.005.

Graph 1

Correlation Between Mcgill Pain Questionnaire and Breast Size.



Graph 2

Correlation Between Visual Analogue Scale and Breast Size

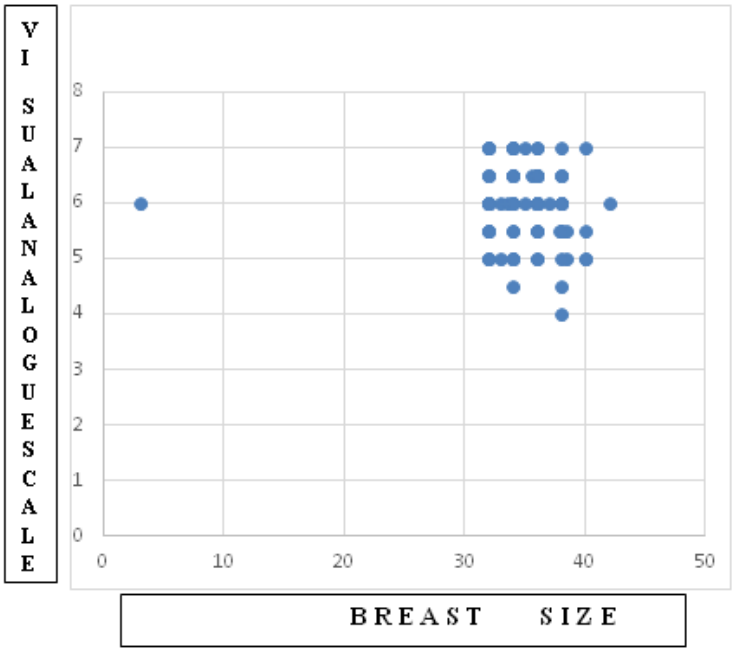


Table 2

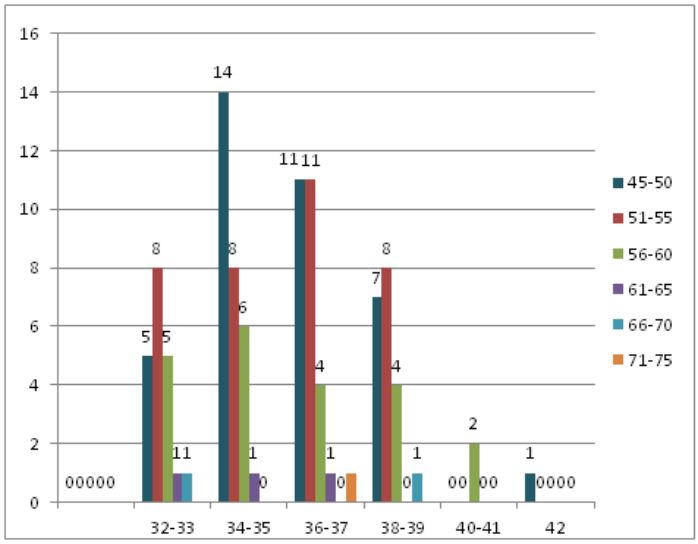
Correlation Between the Variables Breast Size V/S Micgill Pain Questionnaire and VAS.

Variables	Breast size	Age	gender	Value x2	Df	Sig
BREAST SIZE * MCGILL PAIN QUESTIONNAIRE Crosstabulation	32-33 34-35 36-37 38-39 40-41 42	20 -33	Female -100	18.961[a]	25	.799
BREAST SIZE * VAS Crosstabulation	32-33 34-35 36-37 38-39 40-41 42	20 -33	Female -100	25.614[a]	30	.695

P< 0.05 * Table 2 shows that, there is no statistically significant difference between the variables breast size and McGill pain questionnaire (P value is 0.799) , breast size and VAS (P value is 0.695) as the P value is greater than 0.05

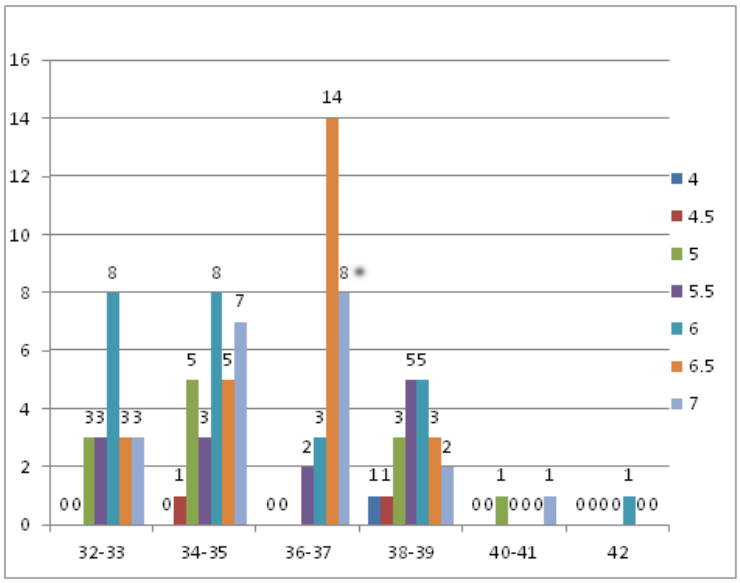
Graph 3

This is the Cross Tabulationgraph Shows the Difference Between Mcgill Pain Questionnaire and Breast Size.



Graph 4

This is the cross tabulationgraph shows difference between the visual analogue and breast size.



RESULTS

Results were analysed by using IBM SPSS version 20.0 software. Pearsons correlation test was applied to assess the correlation between breast size v/s McGill pain questionnaire and breast size v/s VAS. TABLE - 1 shows that, the mean value of McGill pain questionnaire v/s Breast size 53.15, 34.858 and significant value of correlation is .102. The mean value of VAS v/s Breast size 5.975, 34.858 and significant value of correlation is .418. The table shows there is no significant correlation between Breast Size v/s McGill pain questionnaire and VAS, as the P value is greater than 0.05. TABLE – 2 shows that, there is no statistically significant different between the variables breast size and McGill pain questionnaire (P value is 0.799) and breast size and VAS (P value is 0.695) as the P value is greater than 0.05. GRAPH – 1 shows correlation between breast size and McGill pain questionnaire. GRAPH – 2 shows the correlation between breast size and visual analogue scale (VAS). GRAPH –3 shows the cross tabulation between McGill pain questionnaire and breast size among the subjects had breast size (34-35cms) (14) members have reported highest range of

McGill pain questionnaire (45–50) and the subjects had breast size (42) (1) have reported lowest range in McGill pain questionnaire (45–50). GRAPH – 4 shows the cross tabulation between visual analogue scale and breast size among the subjects had breast size (36 – 37cms) (14) members have reported highest score of visual analogue scale (VAS) (6.5) and the subjects had breast size (42) (1) member have reported lowest score (6).

DISCUSSION

The aim of the study was to find the correlation of breast size and mid thoracic spine among postnatal women, In India physiotherapy education on breast care and breast feeding techniques are not well established. It is quite common for a postnatal mother to adapt improper breast feeding position and improper baby handling and inappropriate back care which altogether may cause musculoskeletal problems. Furthermore, the Post natal period in women is rapid transition in terms of fat tissue distribution and increased body weight. These changes also may have an impact on posture of the mother, to analyse this concept, this study was done. In present population the awareness of physiotherapy role in postnatal women is negligible in our culture. Furthermore in our culture and beliefs, women were not free to say about their discomforts (or) problems to doctors and physiotherapists. Even in most times, obstetricians also do not refer the patients with discomforts to physiotherapists. Lot of women were made to live with pain itself, affecting their quality of life. Many women with pain in thoracic region during pregnancy and after delivery pregnancy time are limited to diagnosis of mid thoracic and referral to the physiotherapist. So the purpose of this study was to explain the correlation between size of the breast and mid thoracic region (T4-T7) among postnatal women thus to bring awareness of physiotherapy role among Obstetrician and patients. 100 postnatal women were conveniently recruited with a wide variation in the bra size, the range from 32cms to 42cms. The results of this study shows that there is no significant correlation between McGill pain questionnaire and Visual analogue scale with Breast size ($p>0.05$) indicating there is no correlation or association between breast size and thoracic pain. This can be explained by that all the participants wore brassiere, but interestingly the participants were wearing incorrect sized bra out of (n=100) postnatal women, (n=51) were using proper bra according to their measurement, (n=49) were using improper brasize. This brassiere support may have made the negative results, Few studies states that there is a correlation between wearing wrong sized bra with mid thoracic pain and thoracic kyphosis in young women so further studies with and without brassiere should be down to rule out the effect of breast size on thoracic pain. The results of this study go in hand with Katherine Wood1, et al (2008) who concluded that in young women, it appears that there is no correlation between breast size and thoracic pain[7]. The results are further supported by Linda Spencer and Kathy Briffa (2013) who concluded that breast size, body weight, are many factors which determines the prevalence of mid thoracic pain in postmenopausal women[8]. So although the results shows a negative correlation between breast size and thoracic pain ,future researches should be done in larger population to detail the issue so that the patients can be properly educated and thus they can be provided with a better quality of life. As this results says no correlation between breast size and thoracic pain, the causative factors for thoracic pain may be the improper breast feeding positions, lack of knowledge of back care may be the causative factors for the prevailing mid thoracic pain which needs concentration from physiotherapist to improve the patients quality of life and quality of breast feeding thereby enhancing the health of mother and the child.

CONCLUSION

This study concluded that there is no correlation between increased breast size and mid thoracic pain (T4 – T7) among post natal women.

Limitations

- Smaller sample size.
- Only mid thoracic pain due to increased breast size have taken.
- Breast size were only checked.
- Only Postural correction exercises and Breast feeding techniques were taught.
- All measurements for a given subject in the study were measured by the same individual.
- Primigravida women were only taken.
- Visual analogue scale score (4 – 7).

Recommendations

- Increased BMI in relationship with breast size and body weight is related to thoracic pain was recommended to investigate in further studies.
- Long term effects are recommended.
- Postural corrections for thoracic pain can be experimented.

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SP-36

EFFECTS OF EXERCISE ON VISUAL AND AUDITORY REACTION TIME.

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ABSTRACT

AIM: To calculate and the visual and auditory reaction time before and after giving physical exercises depending on age and gender. METHODOLOGY: Thirty college students were selected randomly and categorised into two groups A and B. Males were categorised into group A and females in group B. Individuals were asked to complete the given tasks and reaction times of both visual and auditory criteria were recorded. After performing exercises, the reaction times were recorded. RESULTS: The results show that the reaction time in males is faster when compared to females. The reaction times were relatively decreased after performing exercise when compared to the previous recordings. CONCLUSION: This shows that the age and gender of an individual has greater significance regarding both the reaction times. And also physical exercise plays an important role in information processing, thereby having an effect on reaction times.

KEYWORDS: ***visual reaction time, auditory reaction time, gender, physical exercise.***

INTRODUCTION

Reaction time is a period between the application of sensory stimulus and immediate response of an organism to it. It is a measure of how quickly an organism can respond to a particular stimulus.It is the time taken by the individual to locate the presence of stimulus.It represents the flow of information from the visual and auditory stimuli to the central nervous system via the sensory neurons and to the peripheral nervous system via motor neurons. In order to react to a stimulus it should be converted to a electrochemical signal. The motor neurons cause muscle to contract or a gland to secrete substance. Reaction that involve only the receptor, the spinal cord effector, are faster than those which involve processing in brain. Reactions which travel to or through the spinal cord mediated reflex are called Spinal Reflex or Cord Mediated Reflex. Eg. With-drawing one's hand from a hot stove. Reaction times are widely used to evaluate neuromuscular response in sports. The faster the stimulus reaches the brain, the faster the signal is processed and necessary response are sent for necessary motor action. Reaction times are reduced with repeated practice with particular stimulus and adequate rest periods. There are three types of reaction time -(1)Simple reaction time-there is one stimulus and one response ;(2)Recognition reaction time- some stimulus are responded and some are not.(3) Choice reaction time-multiple stimulus and multiple response[1,2].There are many factors that affect the reaction time of an individual to a particular stimulus which includes age,gender,alcohol, practice,physical fitness,fatique,distraction, breathing cycle,personality type,practice, intelligence of an individual and whether the stimulus is visual or auditory[3].

Objective

- To determine the visual and auditory reaction times.
- To compare the reaction time on basis of genders.
- To record the reaction times after giving physical exercise.

Inclusion criteria

Age group 18-21.
BMI between 18-39.
Blood pressure below 150/90mmHg.

Exclusion criteria

Individuals who had hearing or visual disorders.
Individuals with Respiratory and cardiovascular disorders.
Individuals with BMI above 39kg/m2.
Individuals with blood pressure above 150/90mmHg.

MATERIALS AND METHODOLOGY

Forty two college students were randomly selected out of which twelve were excluded bases on our exclusion criteria. Out of thirty, fifteen were males and fifteen were females. Males were categorised under group A and females in group B.Voluntary participations were made.The individuals were asked to perform the given tasks. Practice trials were performed in order for the participants to completely understand the task and to get accurate values. Series of experiment were performed. There was only one stimulus and one reponse. The participants were asked to concentrate on the stimulus. To eliminate predictability, the time of stimulus was absolutely random. Five readings of each stimuli were taken and recorded in a quiet secluded room. If they made a mistake, the reaction time was excluded. In simple Visual reaction time, the stimulus was presentation of a red circle followed by changing of red color to blue. The participants were seated at a same place and were asked to press the mouse button with the dominant hand as soon as colour changes. As soon as, the participants see the blue circle they were asked to press the mouse button. In simple auditory reaction time, after variable time intervals sound was played. The task was to press the space bar as soon as they hear a 'bell' sound. Both males and females were asked to participate in 30 min moderate physical activity for 5-7 days which resulted in increased heart rate sweat and breathe activity.

RESULTS

Table1 shows the comparison between auditory and visual reaction time. The study was performed on 30 individuals. The statistical analysis shows that there is highly significant difference between both and therefore, auditory reaction time is faster than visual reaction time.

Table1

Reaction Time	N	Mean ± SD	P
VRT	30	0.357 ± 0.053	<0.001
ART	30	0.318 ± 0.051	<0.001

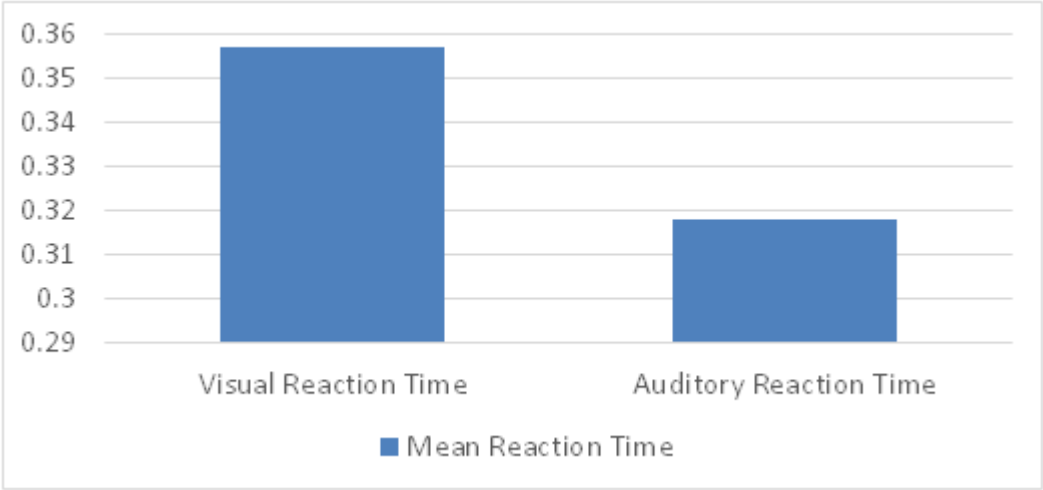

Figure1: *Comparison between visual and auditory reaction time.*

Table2 shows the comparison between reaction times of males and females. The values were highly significant indicating that males have faster reaction time than females.

Table 2

Reaction Time	Female n = 15	Male n = 15	P
VRT	0.367 ± 0.046	0.311 ± 0.036	<0.001
ART	0.347 ± 0.050	0.289 ± 0.034	<0.001

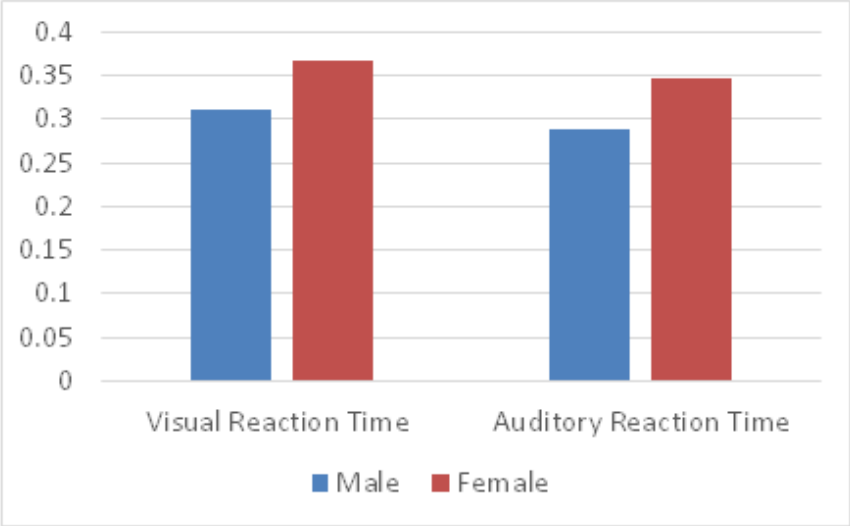

Figure2: ***Comparison based on gender.***

Table3 shows the mean values of both reaction times of individuals who performed moderate physical activity for a week. The results shows that the reaction times of individuals who performs exercise were much lesser than the normal sedentary individuals.

Table 3

Reaction Time	n	Mean ± SD	P
VRT	30	0.342 ± 0.049	<0.001
ART	30	0.282 ± 0.036	<0.001

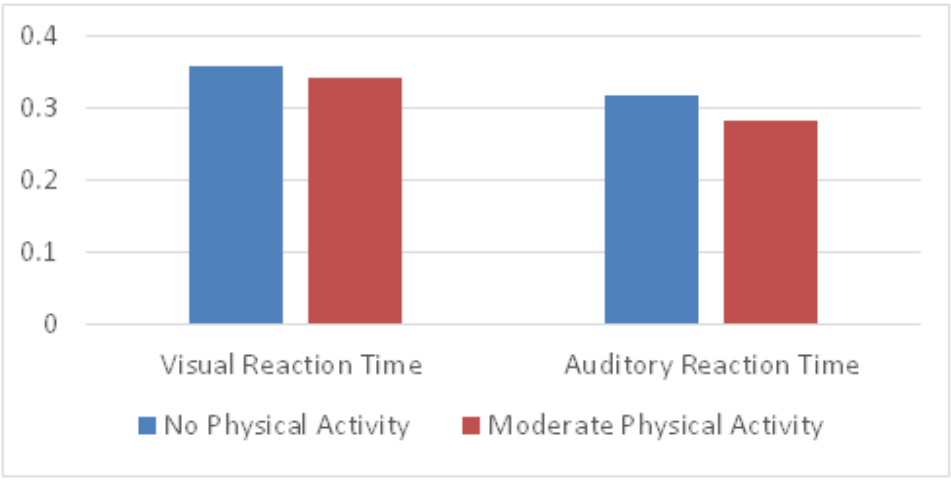

Figure3: ***Comparison of reaction times after performing physical activity.***

DISCUSSION

The motive of the study is to evaluate and compare the reaction times of individuals based on gender and also after performing physical exercise.

Comparison of visual and auditory reaction time

Previous researches regarding the comparison of visual and auditory reaction time shows that the simple auditory reaction time has fastest for any given stimulus [4].It is said that the simple reaction time is fastest

for auditory stimuli compared with visual stimuli. Auditory stimuli has fastest conduction time to the motor cortex along with fast processing time in auditory cortex.The auditory pathway is more polysynaptic than visual pathway.At each synaptic junction, there is a modest and somewhat variable synaptic delay. Auditory stimuli takes 8-10ms to reach the brain whereas visual stimuli takes 20-40ms.Therefore conduction time is greater from cochlea to auditory cortex [5,6].Hence our study further supports the results that auditory reaction time is faster than visual reaction time.

Comparison based on gender

In our study, we also found that the male subjects have faster reaction times when compared to female subjects. This findings is similar to the researches done previously[7].The faster response may be because of the motor response to a particular stimulus.The motor response is faster in males when compared to females because they are comparatively physically stronger than females.This explains why the males have faster simple reaction times for both auditory and visual than females[8,9].Nowadays the male advantage is getting smaller, possibly because more women are participating in driving and fast-action activities[10].The influence of gender on reaction time shows that in almost every age group males have have faster reaction time than females[10,11].Thus, our study further supports the previous evidences.

Evaluating reaction times after performing physical activity

Exercise controls weight management, improves mood, motor function, and cognitive processing [12].When exercise is performed by individuals, the skeletal muscle consume an increased amount of ATP. This elevated demand of aerobic respiration leads to an increase in body`s requirement for oxygen, and therefore explaining the increase in respiration and heart rate effect of exercise.These responses allow more oxygenated blood to flow to many muscles of the body and help to maintain adequate motor functioning[13,14].The individuals who exercise at moderate to intense level have higher rates of cerebral blood flow.This increased blood flow to brain results in improvement in cognitive functioning due to increased supply of necessary nutrients such as oxygen and glucose[15].The evaluation of our study indicates that after physical activity, the reaction times of individuals was found to be faster than non-exercising individuals.The college students who played basket ball and baseball had faster reaction times than sedentary individuals[19]. The less reaction time of athletes as compared to non athletes was attributed to faster central nervous system processing times producing faster muscular movements in athletes [17].The shorter reaction time in atheletes could be due to improved concentration and alertness, better muscular coordination, improved performance in the speed and accuracy task. Also, motor response execution is a physical task, so it is logical that people who trained in physically reactive sports may have superior motor response ability [17, 18].Our study further supports the previous evidences.

CONCLUSION

Our study concludes that auditory reaction time is faster than visual reaction time.And also that males have faster reaction time than females. The reaction times are comparatively decreased after performing exercise when compared with that of previous recording. There is an enhancement in the cognitive information processing during moderate physical exercise.Thus helps in faster responding to stimulus.

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SP-37

A STUDY TO COMPARE VISUAL VESTIBULAR HABITUATION AND BALANCE TRAINING EXERCISES VERSUS PUMA METHOD IN MOTION SICKNESS

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ABSTRACT

Motion sickness is a normal physiological response which causes disorientation and fatigue while travelling. The symptoms can also occur when a visual perception indicates that a motion is taking place, but the body is not actually moving. Motion sickness consists of following of signs and symptoms: drowsiness, dizziness, discomfort, repetitive yawning, stomach upset, nausea, sweating, malaise, vomiting and lack of interest. The study is to compare the effectiveness of visual vestibular habituation and balance training exercises versus Puma method in motion sickness.30 subjects were divided into three groups with 10 subjects in each group of age group between 18-26 years. 10 subjects in Group-A treated with visual vestibular habituation and balance training exercises, 10 subjects in Group-B treated with Puma exercises and 10 subjects in Group C was control group. Severities of motion sickness in Visual analogue scale (VAS), Motion Sickness Susceptibility Questionnaire-Short form (MSSQ-Short) were used. Puma exercises have shown significant improvement in the treatment of motion sickness.

KEYWORDS: ***Motion Sickness, Visual vestibular habituation, Balance training, Puma exercises.***

INTRODUCTION

The motion sickness was first observed 2000 years ago by the Greek physician Hippocrates. He observed that "sailing on the seas proves that there will be motion disturbance in the human body". In ancient time, only few form of passive motion experienced. But, nowadays passive motions such as car, bus, train and airplane and illusion of passive motion (video games on large screen, virtual reality) are very abundant. So, the symptoms of motion sickness becomes the frequent problem.[1-4] Motion sickness is the normal response of the body which causes disorientation and fatigue while travelling.[5]Motion sickness can also be termed as sea sickness, car simulator sickness depend on the cause for the symptoms.[6] It is the physiological response occurs in healthy people who are exposed to motion stimuli that are not experienced before.[7] Motion sickness is experienced while travelling in vehicles such as bus, car, boat or airplane.[8] In India, the prevalence of motion sickness was about 28%. The females are more susceptible for the symptoms of motion sickness than males in the ratio of 5:3.[5,9] The symptoms of motion sickness can also occurs when a visual perception indicates that motion is taking place, but the body is not actually moving.[4,10] The syndrome of motion sickness consists of some of the combination of following signs and symptoms:- drowsiness, dizziness, discomfort, repetitive yawning, stomach upset, nausea, sweating, head ache, malaise, vomiting and lack of interest. There is no dysfunction of the visual and vestibular component in the person with motion sickness.[10-12] The individual without labyrinthine vestibular function does not experience motion sickness.[13,14] so, it is understood that vestibular system takes part in producing nauseogenic stimulus. This stimulus can also occurred by the stimuli that doesn't activate the labyrinth such as illusion of passive motion.[15, 16] The "Sensory Mismatch Theory" is the widely accepted theory for the causes of motion sickness. According to this theory, the brain combines visual information, proprioception and vestibular information for the balance of the body. These sensory signals are merged in the brainstem and cerebellum and proceed to obtain the nature of self-motion. When these information's disagree, there will be a conflict in the brain which causes the symptoms of motion sickness.[10, 17-18] the eyes are important sensors in the human body. It provides visual information to the brain. The proprioceptors situated in muscles and joints are other sensors that provide information about the position and movement of the body. The most important

sensors for balance are called the semi-circular canals located in the inner ear. These canals contain tiny hair like structures which stimulates when there is head movement. The brain receives information from these sensors. Normally, the brain has no difficulty in producing these information's. But when there is any conflicting information, the brain produces the symptoms of motion sickness. During passive artificial motion occurs while travelling, the combinations of these sensory stimuli are found difficult or impossible to be judged by the brain. This is termed as "sensory-conflict".[19-23] The classification of motion sickness is based on the conflicting sensory signal or the sensory conflict occurs between two acute signals. The two major classifications was proposed based on sensory conflict are: [18]

- Conflict between angular and linear vestibular input
- Conflict between visual and vestibular input

When there is conflict between the different signals of the vestibular system without involving visual system it produces vestibular motion sickness. This is termed as vestibular only motion sickness. These conflicts occurs when the signals from semicircular canals provides head rotation and otolith organs provide gravity inertial force vector and integrated. The cross coupled stimulation is the most common form of vestibular motion sickness.[24, 25, 26] The semicircular canals in the vestibular system inform us our angular velocity changes but these semicircular canals cannot able to report the constant velocity rotation. The otolith organs in the vestibular system can measure the direction of acceleration but it cannot differentiate between the gravity and inertial force. These conflicts within the vestibular system causes vestibular only motion sickness.[27] Cross coupled stimulation is also known as Coriolis-effect. This effect may cause disorientation and motion sickness. It was related to the linear movement of the head in rotating plane. When the head is tilted around a roll axis in earth-vertical yaw rotation, the cross-coupling effect is smaller phase. The head tilt with ongoing yaw rotation active or passive, both areas equally disorientating. If these both are performed during locomotion, there is no disorientation or motion sickness.[25, 28]

MATERIALS AND METHODS

Study design : Experimental design
Study type : Comparative type
Sampling method : Convenient Sampling
Sampling size : 30
Study duration : 4 Weeks
Study setting : SRM Institute of Science and Technology, Kattankulathur.

Inclusion criteria

Age:18-26 Years
Both men and women.
Subjects suffering from motion sickness for past 1 year while travelling
Score between 4-8 in Visual Analogue Scale.

Exclusion criteria

Score >8 in Visual Analogue Scale
Recent surgeries
Recent trauma
People with disability who are not able to perform the exercise
Pregnancy

Procedure

Participants were selected according to inclusion and exclusion criteria. They are asked to sign the consent form. Participants were divided into three groups Group A, Group B and Group C. Each group contains 10 participants. Group A were given visual-vestibular habituation and balance training exercises[9], Group B were given Puma exercises[8] and Group C were control group. No exercises were prescribed for control group. The participants are asked to fill the Motion Sickness Susceptibility Questionnaire –Short form[29] and they are asked to rate their severity of motion sickness in Visual Analogue Scale (0- no symptoms to 10- severe symptoms).[30,31] The prescribed exercises has to be followed once a day, for 5 days a week and for 4 weeks.

Visual-Vestibular Habituation and Balance Training exercises

- Sit in a chair; hold an index card with a letter at arm's distance in front of you at eye level. Move the card left to right slowly as you maintain fixation on letters. If you don't feel any symptoms, continue at maximum for 30 seconds.
- Repeat the same activities but move the card in up and down directions.
- Now, keep the card steady move your head from left to right focusing on the clear image of the letter in the card.
- Repeat the previous step but move your head in up and down direction.
- Repeat the step but move your head in side to side direction.
- Stand with the support with eyes closed. March in a place and count up to 50. Try to gradually lift the hand. When you are perform the exercise without support try this with arm at your side.
- Place thick sofa or cushion on floor and place a sheet of paper with horizontal line 10 to 15 feet away from the place where you standing.
- March in place on the cushion, as you look at the horizontal line. Count 50.

Puma exercises

Warm up exercises

- Ten hip rotation to right
- Ten hip rotations to left
- Ten reps of horizontal head rotation
- Ten reps of vertical head tilt
- Ten reps of lateral head tilt

Gradually increase the speed of the exercise and do these exercises for three sets.

Conditioning exercises

- Three to four clockwise spirals
- Three to four anticlockwise spirals
- A figure of eight exercise with upward motion ends.
- A figure of eight exercise with downward motion ends.

Do these exercises for three sets.

Materials used

An index card with a letter
A sheet with a horizontal line.
Cushion or pillow.

RESULTS AND DISCUSSION

TABLE 1 and GRAPH 1: This table and graph compares the pretest and posttest values VAS for severity of symptoms of motion sickness and MSSQ-Short among group A treated with visual vestibular habituation and balance training exercises. As $p<0.005$, there is a significant difference between the pretest and posttest values of VAS, but there is no significant difference between the pretest and values of MSSQ-Short ($p>0.005$). TABLE 2 and GRAPH 2: This table compares the pretest and posttest values for VAS for severity of motion sickness and MSSQ-Short among group B treated with Puma exercises. As $p<0.005$, there is a significant difference between pretest and posttest values of VAS for severity of motion sickness and MSSQ-Short among group B. TABLE 3 and GRAPH 3: This table compares the pretest and posttest values of VAS for severity of motion sickness and MSSQ-Short among group C-Control group. As $p>0.005$, there is no significant difference between difference between pretest and posttest values of VAS among group C. GRAPH 4: This table compares the post test values of VAS for severity of motion sickness and MSSQ-Short form between group A, group B and group C. The post test mean values of VAS among group A was 4.5, group B was 3.0 and group C was 5.5. The post test mean values of group A was 23.22, group B was 19. 09 and group C was 24.66. Group B shows significant improvement in the posttest values of VAS and MSSQ-Short form than other two groups. This study compares the effectiveness of visual vestibular habituation and balance training exercises versus Puma exercises in motion sickness. VAS scale is used to

assess the severity of motion sickness and Motion Sickness Susceptibility Questionnaire-Short form (MSSQ-Short) for the susceptibility of the individual for motion sickness in past days. Rose Marie Rine, 1999 conducted a case study for the treatment of motion sickness using vestibular habituation and balance training exercises. He concluded that the patient doesn't experience much motion sickness on 4th week follow up and there is complete relief from the motion sickness on 10th week follow up. He states that habituation and adaptation exercises are very helpful in relieving the symptoms of motion sickness. He also states that though habituation exercises treats motion sickness, this theory requires an experimental design.[13] Cheiranjeevi Janu, 2015 conducted an experimental design in visual vestibular habituation and balance training exercises and concluded that there is a reduced VAS scores in patients with motion who received visual vestibular habituation and balance training exercises for 8 weeks. He also states that Visual-vestibular habituation and balance training exercises are very easy exercises to be performed by the patient. These exercises can performed easily at home and doesn't require any supervision by the therapist.[8] Puma et al., 2007 states that these habituation exercises can be easily performed by the patient and it doesn't require any supervision. The exercises are comprised of two phases warm up phase and conditioning phase. This exercise requires about fifteen minutes each day and improvement can be seen within 2 weeks.[9] The statistical analysis of this study shows significant improvement in the groups treated with exercise and there is no significant improvement in the control group. The mean value of pretest VAS is 5.9 and posttest VAS is 4.4, pretest MSSQ-Short form is 25.94 and posttest MSSQ-Short form is 23.22 among group A treated with Visual vestibular habituation and balance training exercises. As $p<0.005$, there is a significant difference between pretest and posttest values among group A. Thus, the result falls in hand with Chiranjeevi Janu, who concluded that Visual vestibular habituation and balance training exercises are effective in treating motion sickness. The mean value of pretest VAS is 5.8 and posttest VAS is 3, pretest MSSQ-Short form is 24.84 and posttest MSSQ-Short form is 19.09 among group B treated with Puma exercises. As $p<0.005$, there is significant difference between pretest and posttest values among group B. Thus, the results falls in hand with Puma et al. who concluded that these habituation exercises have significant effect in reducing the symptoms of motion sickness. Thus the groups received exercises were shown to have significant improvement in reducing the symptoms of motion sickness. The group which didn't receive any exercise doesn't have any improvement. The mean posttest values of VAS and MSSQ-Short of group A are 4.5 and 23.22. Mean posttest values of VAS and MSSQ-Short of group B are 3.0 and 19.09. Group B who were treated with Puma exercises shown to have reduces posttest values of VAS and MSSQ-Short form than Group A who were treated with Visual vestibular habituation and balance training exercises. Though group A have significant improvement in reducing the symptoms of motion sickness, it is minimal when compared to Group B who were treated with Puma exercises. Puma exercises (Group B) were shown to have significant improvement in reducing the symptoms of motion sickness than Visual vestibular habituation and balance training exercises within four weeks of exercise protocol.

Table-1

Comparison of pretest and posttest values of VAS for severity of motion sickness and MSSQ-Short among group A treated with visual vestibular habituation and balance training exercise.

Group c	Mean		S.d		T value	Sig.
	Pre test	Post test	Pre test	Post test		
VAS	5.5	5.5	1.26	1.15	.000	1.00
MSSQ-Short	24.98	24.66	7.70	6.79	0.87	0.40

Graph 1

Comparison of pretest and posttest values of VAS for severity of motion sickness and MSSQ-Short among group A treated with visual vestibular habituation and balance training exercise

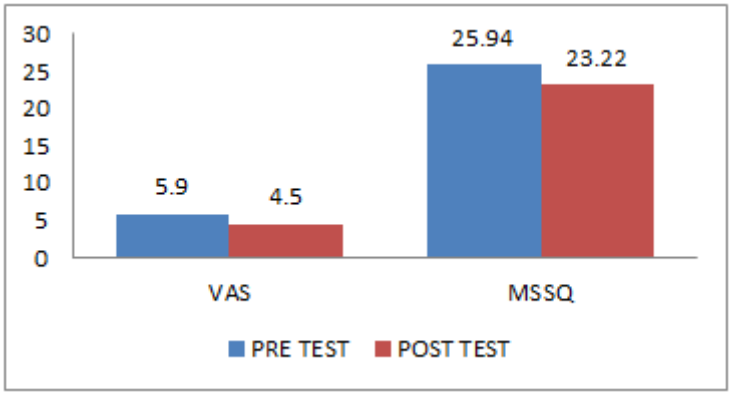


Table 2

Comparison of pretest and posttest values of VAS for severity of motion sickness and MSSQ-Short among group B treated with Puma exercises.

Group b	Mean		S.d		T value	Sig.
	Pre test	Post test	Pre test	Post test		
VAS	5.8	3	1.31	1.33	11.22	.000
MSSQ-Short	24.84	19.09	8.42	7.78	9.73	.000

Graph 2

Comparison of pretest and posttest values of VAS for severity of motion sickness and MSSQ- Short among group B treated with Puma exercises.

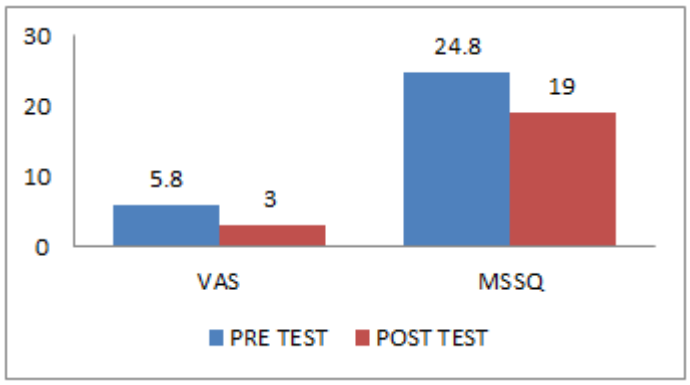


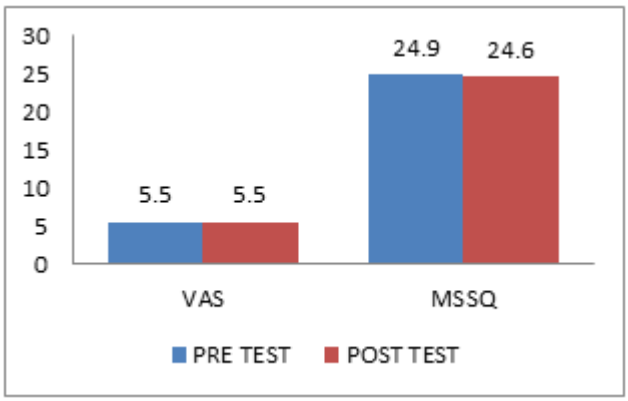
Table 3

Comparison of pretest and posttest values of VAS and MSSQ-Short among group C- Control group.

Group A	Mean		S.D		T value	Sig.
	Pre test	Post test	Pre test	Post test		
VAS	5.90	4.50	1.19	1.43	8.57	.000
MSSQ-Short	5.94	23.22	10.78	9.88	3.17	.011

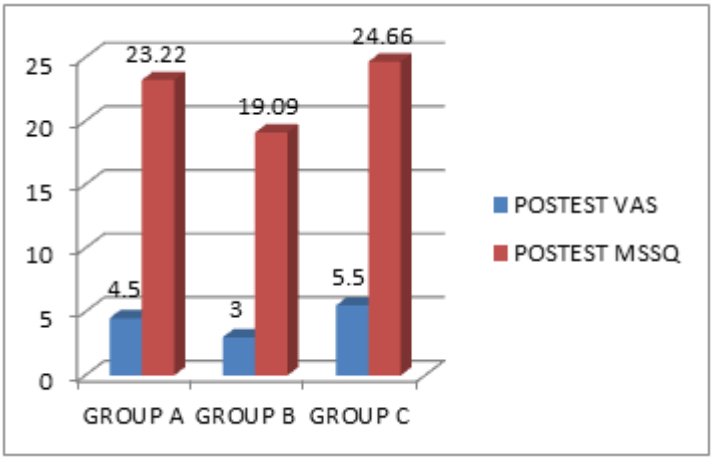
Graph 3

Comparison of pretest and posttest values of VAS and MSSQ-Short among group C- Control group.



Graph 4

Comparison of posttest values of VAS and MSSQ-Short between Group A, Group B and Group C.



CONCLUSION

This study concludes that Group B participants treated with Puma exercises have shown to have significant improvement in treating motion sickness than Group A participants who were treated with Visual vestibular habituation and balance training exercises within four weeks exercise protocol. Thus, this study concludes that Puma exercises have significant effect.

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SP-38

ASSOCIATION BETWEEN SLEEP QUALITY WITH CARDIORESPIRATORY FITNESS AMONG ADOLESCENT GIRLS

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ABSTRACT

This study was aimed to determine the association between sleep quality with cardiorespiratory fitness among adolescent girls. The objective of this study was to investigate the sleep quality with CRF among adolescent girls.CRF was predicted by maximal multistage 3m step test according to procedures described from FITNESSGRAM .It is a health related physical fitness assessment. Each of the test items were selected to assess important aspects of a student's health related fitness, not skill or agility.Sleep quality was significantly associated with CRF. Poor sleep quality was associated with lower CRF .Methodology: Study is designed as an observation study; study setting is done at the saveetha college of physiotherapy .Sample size: 20 females between the age of 15-18 years. Procedure: This is a cross-sectional study of 20 adolescent girl aged 15-18 years. The cardiorespiratory fitness was predicted by 3m step test according to the procedure described from fitness gram .The test was assessed carefully before and after it is performed .The sleep quality was assessed by a questionnaire given to individuals.Result: Girls who are classified as fit were more likely to report better sleep quality when compared to unfit peers.This study shows that increased sleep quality has greater significance when compared to decreased sleep pattern.

KEY WORDS: ***3m step test, fitness gram, sleep quality.***

INTRODUCTION

Cardiorespiratory fitness (CRF) refers to the ability of the circulatory and respiratory systems to supply oxygen to skeletal muscles during sustained physical activity [1]. Cardiorespiratory fitness is a measure of how well your body is able to transport oxygen to your muscles during prolonged exercise, and also of absorb and use the oxygen, once it has been delivered ,to generate adenosine triphosphate (ATP)energy via cellular respiration(cellular respiration is a chemical process in your body's cells that converts the energy stored in the food you eat into the ATP form of energy that is recruited for use by your muscles)[2].Essentially ,your cardiorespiratory fitness level is a measure of the strength of your aerobic energy system [3]. Cardiorespiratory fitness (CRF) can be improved by performing any type of prolonged exercise that recruits your aerobic energy system [4]. Any exercise activity that gets your heart rate up and keeps it up for a prolonged period of time qualities as legitimate cardiorespiratory exercise and is beneficial for your aerobic fitness [5]. Sleep is an active process .Brain's overall activity is not reduced .During certain a stage of sleep, O2uptake by the brain is even increased above normal waking levels [2]. So, sleep quality play an important role .A person is said to have a good sleep quality who falling asleep in 30 minutes or less [6]. And a person with bad sleep quality will be spending enough time in deep sleep .If the sleep quality is affected it may cause many changes in our body, and cause poor nutrition and poor health [7]. The periods of sleep quality is important in ADOLESCENT GIRLS from age 15-18, for the better health status in day to day activities [8]. Sleep is vital for learning and memory .We need quality sleep to be able to concentrate in our day to day activities [9].We need enough sleep to feel rested and energized (and therefore motivated). The Optimum sleep is no less than 6.5 hours, no more than 9 hours; generally young adults need about 9 hours to function at their best [10].There are stages of sleep, from light sleep (Stages 1 and 2) to deep sleep (Stages 3 and 4) .Sleep occurs in cycles, average length 1.5 hours, during which we go from light to deep sleep and back again .Normal to wake up during the night ,during our 'light' sleep cycles, but should be able to get back to sleep again .Its takes approx 20 minutes for us to go from wide awake to deep sleep [11]. The cardiorespiratory fitness can be broken down into two components .The first component of cardiorespiratory

fitness is the ability of your body to transport oxygen to your muscles during prolonged exercise .The second component of cardiorespiratory fitness is the ability of your muscles to absorb and use oxygen while you are exercising [1] .Your body's ability to transport oxygen to your muscles is dependent on the coordinated activities to your heart ,arteries ,veins and lungs [5].The process works like this:

1. First air is breathed into your lungs .The oxygen in the air you breathe is absorbed into the blood in the capillaries that surround your lungs and then transport via the pulmonary vein the left side of your heart
2. The oxygenated blood is pumped out of the left side of your heart and into the arteries that deliver it throughout your body to your muscles.
3. When the oxygenated blood reaches your muscles the oxygen is absorbed into your muscle cells from the blood capillaries that surround them. At the same time that your blood is providing oxygen to your muscles, it is also removing carbon dioxide, a waste product from muscles cellular [6,7].

CRF has also been demonstrated to be an important marker of functional limitations and frailty .This is an important issue because functional capabilities and frailty are related to an individual's quality of life during the extended longevity that may result from higher CRF, and they have major implications for disability, increased dependency, and hemorrhaging healthcare costs [12] .This causes difficulty in walking, climbing stairs, etc. CRF predicts lower mortality and lower rates of frailty and depend on healthcare services at all age levels [13] .There is a direct and growing evidence that an improvement in CRF over time has a considerable effect on lowering mortality [7]. Importance of cardiorespiratory fitness is to reduce the risk of chronic diseases .It improves the quality of life and makes the person live longer .Increase in CRF are associated with a reduction in death from all causes .Higher levels of CRF are associated with higher levels of habitual physical activity, which in turn are associated with many health benefits [14] .Lower levels of CRF have been associated with a markedly increased risk of premature death from all causes and specifically from cardiovascular disease. The assessment of CRF is an important part of a primary or secondary prevention and rehabilitative programs. It also improves your energy level and will help you feel and look good [8]. It creates body fat loss and helps in stress reduction. CRF help in increasing the lifespan of an individual. It strengths the heart muscle and decreases the chance of heart disease and helps in increasing the sleep quality of an individual and improves self concept [14]. So, for an individual to lead a happy and disease free life sleep is very important. Sleep improves quality of life and provides better health and CRF also plays an important role in it.

MATERIAL AND METHODS

Study Design: observational study
Study Setting: Saveetha College of Physiotherapy, Saveetha University, Thandalam, Chennai-602105.
Sampling Method: Random sampling method.
Sample Size: 20 healthy subjects were selected between the age group of 15-18 years.

Inclusion Criteria

- Subjects age group -15 to 18 years.
- Subjects involved-only girls.
- Normotensive
- Subjects those who are willing to participate.

Exclusion Criteria

- Subject those who are not willing to participate.
- Students under medication.
- Psychological problems.

Materials required

- Sleep quality index questionnaire.
- 12-inch bench or box.
- Stop watch or clock.

Procedure

Selection of subjects is done based in inclusion criteria. Consent was obtained from all participants. The nature of the study and uses of the study was clearly explained to the subjects. The assessment of sleep quality was determined using sleep quality questionnaire which will be given to every individual who are involved in the study. The assessment of cardio respiratory fitness can be done by using the 3m step test . This 3m step test shows the maximum heart rate of the individual. The speed at the start is quite slow. The subjects resting heart rate is taken and then they undergone 3m step test in which the individual will climb up and down a two step stairs for 3min and their pulse rate was recorded.The advantage of the test is large groups can perform this test all at once for minimal costs. Also, the test provides maximum effort unlike many other tests of endurance capacity.

Treatment session

Duration of each session: 15 minutes.
Number of sessions: 1 session/day.

3 min step test	Mean	Standard Deviation
Heart rate	87.62	1.27

3 min step test	Mean Ml/kg/min	Standard deviation Ml/kg/min
VO2 Max	29.2	1.98

RESULT

The study shows the minute mean and standard deviation maximum heart rate of the individual who undergone 3m step test was 87.62 and 1.27 per minute, the mean vo2 max of the individual was determined as 29.2ml/kg/min and the standard deviation was 1.98 in low sleep quality women. So, this study shows the girls who were under normal category are more likely to have a good quality of sleep. By checking these cardio respiratory fitness individuals sleep quality is determined separately. They help in identifying the individual with good sleep quality and improve the quality of life.

DISCUSSION

There is a strong and consistent evidence from observational studies that physical inactivity and poor cardio respiratory fitness are associated with higher illness and death from all causes, including cardiovascular disease(CVD) and cancer.v02 maximum is considered to be the most valid measure of cardio respiratory fitness [15]. It measures the capacity of the hear t, lungs, and blood to transport oxygen to the

working muscles, and measures the utilization of oxygen by the muscles during exercise [16]. Jorge mota ela al. has determined that the poor sleep has reduced the cardiorespiratory fitness in young women and this study also supports our study, in additionally he had correlated sleep also with the BMI [17]. Central America and Caribbean had studied about the short sleepers and determined that short sleepers have increased BMI and reduced cardiorespiratory function [18], in our study we focused on the quality of the sleep and we determined reduced VO2 max in poor sleep quality womens. Recinial et al., hicks et al., and chang et al., had determined that high prevalence of poor sleep in womens but there is no significant difference in the VO2 max in the womens respectively [19,20,7] but in our study there is a significant decrease in the Vo2 max in poor sleep quality womens. This study on adolescent girls examines the association between their CRF and sleep quality .The primary finding of this study was that CRF in this population was associated with sleep quality .Unfit prevalence found in our study must be highlighted because our data also showed that the percentage of poor CRF girls were classified as unfit. Additionally, our data showed that girls who were classified as fit were twice as much higher odd to report better sleep quality when compared to unfit individuals. This outcome is important from health perspective. Indeed, lower fitness status has been related to lower level of physical activity, which in turn is related to lower availability to perform daily task and further increases in aerobic capacity levels.

CONCLUSION

In conclusion the study shows that due to increase in CRF the sleep quality decreases in adolescent subjects. Sleeping quality was significantly associated with CRF. Girls who were under fit category were more likely to report better sleep quality compared to their unfit individuals. From this result, it is concluded that cardio respiratory (CRF) is effective in maintaining the muscular strength, muscular endurance and improves the flexibility and helps in improving the quality of life.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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SP-39

WOMEN WITH MUSCULO SKELETAL DISORDERS IN RURAL KANCHIPURAM DISTRICT– SURVEY ANALYSIS

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ABSTRACT

Introduction: Indian health care is witnessing with facilities and expertise with global competence but its rural brethren are yet to benefit from the advantages and benefits. Aims & Objectives of this original community research was to highlight rural women with musculoskeletal disorders, prevalence and need for their health care with physiotherapeutic means. Materials & Methodology: regular monthly community health camps are conducted from 2006 till 2018 at rural kanchipuram district around Nadupalani by faculty and students of Sree Balaji college of Physiotherapy. Inclusion Criteria: Women subjects between 18-70 years who has attended the camps with MSD are included in the study. Exclusion Criteria: Men, women below 17 years and above 71 years are excluded. Methodology: List of questionnaire related to women MSD was used with 10 items on a closed ended questionnaire .Results were analyzed and discussed with evidence. Conclusion: Findings of the study nessiates the planning and execution of health care needs including the availability of physiotherapist in rural areas to ensure good QOL of rural women population

KEYWORDS: ***MSD – Musculoskeletal disorders, WHO – World health organization NGO– Non-Governmental organization, QOL – Quality of life OA – OsteoArthrosis, LBA – low back ache.***

INTRODUCTION

Musculoskeletal disorders are defined as injuries and disorders of the muscles , tendons, ligament's, nerve, discs.(1)Global prevalence of MSD's was 8.4% with its burden increases with age and is ranked as sixth cause of years of life disability(2) and 20% of the adults were affected with pain related to Musculoskeletal disorders (3). Rural health care is one of the biggest challenges with 70% population living in rural areas and low-level health facilities (4).India has 28.7 crore illiterates was the largest number of adults without basic literacy skills in 2010-2011.Globally 74% of the agricultural workers are living in Asia and Pacific regions (5).Since 68% of the population is living in rural areas, agricultural based activities play an important role in improving the rural economy of India(6).Pain is the most prominent symptom and most determinant of disability in patients with osteoarthritis knee(7).Musculoskeletal conditions caused 40% of all chronic conditions 54% of all long-term disability and 24% of all restricted activity days (8)WHO reported that OA knee is the 4th most common cause of disability in women (9) and worldwide prevalence estimate for symptomatic OA is 9.6% men & 18% women (10). In developing countries collective growth of their society as a whole rural public's status of health prevalence of diseases and disorders, level of literacy, accessibility, affordability and availability of timely medical intervention can save lives and improve the standard of rural population life style (11).

Aims & objectives

This original community research was to highlight rural women with musculoskeletal disorders, prevalence and need for their health care with physiotherapeutic means

Need of the study

As rural women are deprived of due health care with physiotherapy with few studies available, this original study gets more significant to analyse rural women's health needs.

Inclusion criteria

Women subjects between 18-70 years who has attended the camps with MSD are included in the study.

Exclusion criteria

Men, women below 17 years and above 71 years are excluded.

MATERIALS & METHODOLOGY

Regular monthly community health camps are conducted from 2016 till 2018 at rural kanchipuram district in Acharapakkam around Nadupalani by faculty and students of Sree Balaji college of Physiotherapy. These health camps were mobilized through public address system with dates and details of facilities provided and distributed with printed palmlets in Tamil to residents of villages around nadupalani of Acharapakkam. With the total of 600 subjects screened in these camps, 316 women's between 18 – 70 years were included in this study.

Ethics, approval by authorities and consent

Institutional ethical committee approval was obtained, due permission to conduct health camps were received from the Govt of TamilNadu and local village authorities.

Procedure

List of questionnaire related to women MSD was administered among the participants of the camp by physiotherapy faculty and students with 10 items on a closed ended questionnaire on age, literacy, habits, prevalence of MSD are analyzed as below:

Picture: 1

Picture: 2

Picture:3

picture: 4

Screening, evaluation and treatment by physiotherapist & pupil physiotherapist

RESULTS

Total no.of.subjects: 600
Total no.of .female subjects: 316

Table 1
Age wise distribution

AGE (Years)	NO.OF.SUBJECTS	%
18 – 30	67	21%
31-45	110	35%
46 – 60	83	26%
61- 70	56	18%

Table 2
Socio-demographic details

Level of literacy			Tobacco consumption	Chewing	Alcohol
Middle	HSC	Graduate			
214 (68%)	63 (20%)	39 (13%)	204 (65%)	90 (29%)	20 (6.32%)

Table 3
Age wise distribution of msd

AGE (In years)	OA knee 166 (53%)	LBA 40 (13%)	SHOULDER 56 (18%)	NECK 35 (11%)	OTHERS 19 (6%)
18 - 30	37 (23%)	6 (15%)	9 (17)	5 (15%)	02 (11%)
31-45	66 (40%)	9 (23%)	10 (18%)	12 (43%)	07 (37%)
46 – 60	43 (26%)	14 (35%)	14 (25%)	8 (23%)	06 (32%)
61- 70	20 (13)	11 (28%)	23 (42%)	10 (29%)	04 (22%)

DISCUSSION

1. Rajasthan based study conducted among ten thousand women subjects of both rural and urban areas of jodhpur have recorded 12% rural population to have musculoskeletal disorders as compared to urban population at 9%, with 68% had osteoarthritis knee , 48% with low back ache. (12)
2. Osteoarthritis knee low socio economic group was found to higher compare to middle group among rural areas of Bangalore. As recorded in table :3 with prevalence of MSD among rural kanchipuram district was 53% had OA Knee , 13% with LBA, 18% with shoulder ailment where OA Knee was more affected ailments among this study subjects similar to Rajasthan and Bangladesh study reports.
3. Another Dharwad based study indicated women with osteoarthritis of 66% and men at 34% in a community based rural study among 102 subjects. (13) In a Bangladesh based study among 162 obese subjects with 40% females below 50 years, 50% with OA, 30% with Low back ache(14) .OA knee can affect QOL increase dependency and leads to disability(15).
4. Whereas this study carried out in the rural kancheepuram district have recorded 40% above (31-45) years to have OA, 35% of the subject between (46-60) years to have LBA,43% found to have symptoms of CS.
5. Globally 47% of men and 12% of women smoke, Tobacco use alone is currently ranked fourth in the world for loss of life (16) which can be preventable. Smoking causes 71% of lung cancer, 42% of chronic respiratory diseases and 10% of cardio vascular disease (17)

6. Tamil Nadu, India based study has revealed 23.7%, rural 19.4% urban smokeless tobacco chewers and 39.6% male, 5% female smokers (18).This study we recorded with Tobacco consumption 65%, chewing 29%.
7. With Indian literacy rate at 74.4% where 65% are female literates, with Tamil Nadu state 80.33% where female literates are 64%. With kancheepuram literate 84.49% and its rural female literacy rate of 68% (19).Exactly coincides with this study subjects with 68% as literate.
8. Subjects who have availed physiotherapy elsewhere earlier was 9% and 80% of the participants were earlier not aware of physiotherapy in improving their QOL.

Limitations of this Study

No specific investigation such as X- ray, NMRI, was used. Subjects were treated once a month with physiotherapy with no follow–up are major limitations.

Further Recommendations

Regular physiotherapy services should be made available at rural India. Promotions of health care activities by NGOs, government for increasing awareness as well to improve the QOL of rural women population are highly recommended.

CONCLUSION

Women with musculoskeletal disorders have disability as trio (being women, hailing from rural area and non earning dependable with disability). Hence strengthening of rural physiotherapy services are need of the hour.Govt, NGO and as physiotherapists we should serve rural women which is their right and our duty to serve them.

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SP-40

THREE YEAR FOLLOW UP OF STROKE SUBJECT – LACK OF REGULAR PHYSIOTHERAPY - AN INSIGHT WITH EVIDENCE.

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ABSTRACT

Introduction: - Early age onsets of stroke are evidenced. Regular medication and physiotherapy are key factors in neuro rehabilitation and the subject's quality of life (QOL). Aims and objectives: - Of this original follow up of a stroke subject was to analyze the impact of irregular physiotherapy affecting subject inflicted with stroke on his Quality of life (QOL). Materials and Methodology: - 41 year old male, occasionally alcoholic, ectomorphic had a cerebral Ischemia in Aug 2015 was treated medically and physiotherapy with reasonable recovery for his left hemi paresis. With irregular physiotherapy after 3 years in Jan 2018 the subject reported to physiotherapy department. An analysis of this study with evidence on balance , degeneration , spasticity , low confidence , difficulty in walking are to be discussed with evidence. Conclusion :- Lack of regular physiotherapy follow up of stroke subject can be a challenge for the therapist, subjects suffering and a burden to his family are evidenced hence regular follow up are to be adhered with neurological ailments, are highly recommended.

Keywords: ***QOL- Quality of life, ischemic attack, HP- hemi paresis, LLD- limb length discrepancy, ADL- activities of daily living, DALY- disability adjusted life years, TNF – tumor necrosis factor***

INTRODUCTION

Stroke which is defined as a sudden interruption of blood flow to the brain that lead to loss of neurological and lasted for more than 24 hours[(1)]. Global stroke prevalence rate as 5/1000 person – years, 5.9 million people suffered a stroke related death in 2010, stroke related 102 million lost disability adjusted life years (DALY) [(2)].There has been a 26 % rise in stroke incidence in past two decades, and remains the second leading cause of death worldwide. [(3)] The stroke prevalence in India ranged from 44.29 to 559/100,000 persons during past two decades. [(4).] The neurological deficits often occur at three levels as body function and structure, activity and participation. Amongst these three levels the first level exhibits unilateral hemi paresis and spasticity which is more of a functional disability [(5)] causing the next two levels as loss of activity or motor performance and reduced participation in activities of daily living (ADL).

Aims and objectives

This original three years follow up of a stroke patient aims to analyze with evidence various complications post stroke a subject is lightly to develop if physiotherapy is irregular with evidence.

Need of the study

With few post stroke follow up researchers are available, this original study which analyses the role of physiotherapy when not given as the subject continued 3 years with medication alone(T. ecosporin, T Atorva , T. Strocit) but no physiotherapy , hence the need arises for this research presentation.

MATERIALS AND METHODOLOGY

41 year old marketing executive occasionally alcoholic, non-hypertensive, Ectomorphic developed left hemiparesis with cerebral ischemia in Aug 2015 subsequently treated with due medical and physiotherapy means till December 2015 for 3 months, with reasonable recovery the subject was ambulant and functionally improved adequately. Later the subject was irregular, non-adherent during the period from January 2016 till October 2018, In November 2018 he has reported to physiotherapy department with following complaints

- c/o fear and an increased frequency of falls, pain in back of the left knee, o/e left hamstring tightness, patellofemoral arthritic changes, decreased balance in standing, increased spasticity of both upper extremity and lower extremity, pain increased on transfer of activities from sitting, to standing – walking over knee and hip, quadriceps wasting (left) by 3 cms ,left hip and knee flexor tightness, adaptive shorting of left leg limb length discrepancy by an inch, hyper reflexia of knee and ankle + + +, Ambulant unaided under supervision.

RESULTS AND DISCUSSION

The following are the major challenges influencing the subject's quality of life (QOL), getting discussed with evidence thus highlighting the long term follow up and regular adherence with physiotherapy having huge impact on stroke subjects health and functional means.

Pain

Amongst long term complications are musculoskeletal complications are common, knee osteoarthritis which is altered by improper gait biomechanics thus developing pain in the knee with genu recurvatum and stiff knee gait [6]. Similar to this study subject with patellofemoral changes of degeneration

Atrophy of muscle

As quadriceps atrophy by 3 cms post stroke in this subject are supported by 3 reasons as below. Reduced muscle mass or atrophy has been related to poor fitness and physical performance capacity after stroke, it is not related to the reduced central muscle activation [7]. Strength deficit and spasticity interfered in the motor performance [8]. Tumor necrosis factor (TNF) alpha and inflammatory pathway activation could be a possible factor for muscle atrophy and altered muscle metabolism [9]

Soft tissue tightness

This subject in 3 years post stroke with lack of proper physiotherapy and decreased physical activities has developed hip and knee flexor tightness of the ipsilateral (stroke) side, due to compensatory supraspinal drive and defective behavior of reflexes leads to paresis and movement paucity, also leading to secondary muscular changes and loss of sarcomere and subclinical contracture leading to soft tissue tightness [10]

Involuntary movement

Involuntary flexion of the upper extremity of the upper limb is more pronounced during walking [11] Flexed posture of upper extremity develops due to chronic hemi paresis [12]. The interlimb neural coupling has been due to increase in excitability of vestibulospinal pathway an enhanced coupling between upper and lower extremity associated with spinal networks controlling walking [13]

Increasing spasticity

In this subject with irregular physiotherapy, lack of weight bearing including walking as supported , spasticity is present in about 20- 40 % of stroke survivors [14]. Spasticity, which is recognized as phenomenon of velocity – dependent increase in tone stretch reflexes with exaggerated tendon jerks, resulting from hyper excitability of the stretch reflex[15]. The onset of spasticity is highly variable and can occur in short, medium or long term past stroke period [16]. Spasticity induces pain, tendon retraction or weakness in patients limiting rehabilitation and potential outcome. Being detrimental to daily function it affects the day to day life activities due o lack of guidelines for individual rehabilitation programme [5, 17].

Adaptive shortening

Limb length discrepancy (LLD) as a long term complication in long neglected physiotherapy cases, which is due to reduced knee range of motion of paretic limb, increased hamstrings – quadriceps muscle imbalance from weight transference to non paretic lower limb [(18)], whereas with regular physiotherapy from now on these changes can be reversible or are to be done in later period.

Mal alignment

Mal aligned trunk can be due to weak postural muscles, loss of equilibrium, righting reactions thus assuming asymmetrical posture. This further leads to the development of scoliosis due to imbalanced skeletal muscle activity, soft tissue shortening, and inability to perceive midline. The duration of illness, degrees of spasticity and have also been affecting [(8)].

Decreased balance, risk and fear of fall Transfers and ambulation

Mobility restrictions are more disabling and burden on the care givers. Functional independence due to paucity of movement related to walking and transfers causing to risk of falls leads to poor negative prognosis [(19)]

Functional activities and quality of life (QOL)

Long term rehabilitation and follow up seldom occurs, to maintain physical functioning and capacities a continuum physiotherapy rehab is mandatory. Inactivity may lead to reduced physical capacity and muscle strength leading to dependency and decreased life expectancy. [(20)]

Non adherence and irregular physiotherapy

Lack of long term follow up has shown poor improvement in hemiplegic patients, where the stage and duration of stroke needed to be considered [(21)].Social inactivity and depressive symptoms are highly prevalent on a long term follow up of stroke subjects [(22)] This study subject has given counseling and explained for continued physiotherapy and an increase in his level of specific physical activities which needs further re evaluation by physiotherapist.

CONCLUSION

Neurorehabilitation post stroke , necessitates regular follow up and adherence with physiotherapeutic means due to documentation proper physiotherapy and subjects commitments , this presentation highlights the core role of physiotherapy if inadequately , irregularly utilized . Thus it is evidenced that regular physiotherapy treatment and long term follow up are key in maintaining quality of life (QOL) of stroke subjects. Limitations of this presentation are case design, only lack of physiotherapy was highlighted. Further recommendation with more randomized control trial (RCT) and regular physiotherapy along with prescribed medication.

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EFFECT OF EARLY INTERVENTION ON NEURODEVELOPMENTAL OUTCOME OFLOW BIRTH WEIGHT INFANTS

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ABSTRACT

The steady improvement in the quality of perinatal care has enhanced the survival of at-risk infants who are at-risk for developmental delay. The ability to identify infants with early neurodevelopmental problems has become a priority. Many of these infants have developmental disabilities that require therapeutic intervention to avoid secondary problems. A prospective, controlled trial was conducted to assess the effect of early physical therapy intervention on LBW infants. A cohort of 100 LBW infants who got admitted in neonatal intensive care unit (NICU) and referral newborn (RNB) of Raja Muthiah Medical College and hospital (RMMCH) were included prospectively. Infants who received regular early intervention were assigned as interventional group (EI) & infants who were advised but did not turn up for early intervention and received conventional physiotherapy as control group (NEI). Early intervention consists of providing continuous multidisciplinary services to infants from birth throughout the first year of life. The Denver developmental screening test (DDST) and Amiel-Tison neurologic examination was used and results were compared. The average level of the achievement in developmental domains in both groups of infants was compared. Results: The data shows significant benefit in the achievement of developmental domains in EI group. Conclusion: The study suggests a positive effect of early intervention in the neurodevelopmental outcome in EI group over NEI group of infants.

Keywords: *Low birth weight infants, Early Intervention, Neurodevelopment*

INTRODUCTION

The steady improvement in the quality of perinatal care has enhanced the survival of at-risk infants who are at-risk for long-term disabilities[1,2] Even though there is a substantial improvement in neonatal survival, the incidence of long-term and chronic morbidities, and adverse outcome in LBW infants continues to be high and has not much declined.[3,4] The ability to identify infants with early neurodevelopmental problems has become a priority. Many of these infants have developmental disabilities that require therapeutic intervention to avoid secondary problems.[5,6] Early intervention (EI) consists of providing continuous multidisciplinary services to infants from birth throughout the first year of life .It means interventional therapy specified for babies at-risk for developmental delay and periodic developmental assessment of motor, cognitive function, language/adaptive functioning [7]. EI promotes child health, minimize developmental delays, prevents functional deterioration, and promotes parent-child interaction.[7] The primary aim of the study is to assess the clinical effectiveness of early intervention as assessed by the developmental and neurological outcome in low birth weight infants. DDST comprising of gross motor, fine motor, personal social and language domains was used prospectively to evaluate the effects of interventions. There are various longitudinal studies related to the neurodevelopmental outcome of prematurely born infants.[8,9] EI showed greater developmental and neurological progress in acquisition of skills, cognition, intellectual, social functioning and increased weight gain.[10-12] However, results from several studies are not conclusive. Many recommend the study of specific developmental training techniques to find positive effects of EI on neurodevelopment of infants during their first year of life.[13-

[15] Thus, we employed these techniques to study the effect of EI in the neurodevelopmental outcome of low birth weight infants.

MATERIALS AND METHODS

Subjects

LBW newborns from NICU and RNB of our hospital over a period of two years were recruited for the study. Inclusion criteria: birth weight < 2500 gm[16], Singleton delivery. Exclusion criteria: Congenital infections, Neonates with major congenital malformations of cardiovascular, central nervous and respiratory systems or dysmorphic babies. Infants who took regular early physiotherapy intervention were assigned as interventional group (EI) & infants who were advised but did not turn up for early intervention and took conventional physiotherapy as comparison group (NEI) and was followed up till 12 months. Sixty infants constituted the EI group (31male and 29 female) and forty infants (21males and19 females) in the NEI group.

Early Intervention

EI was initiated for high risk infants right from the neonatal period after the babies became stable. Early intervention applied remarkably to LBW infants, in order to arouse their actions and feelings, ultimately giving them a normal experience of development through interaction with the mother and environment.[7] The individually adjusted program was described to the parents (especially to the mother), who were trained and received written programs elaborated for their infants. These programs contain intensive schedules to develop elementary sensorimotor patterns[17,18] individualized care plans centered on the infant developmental, mother-child interaction and extending to vision, hearing, feeding, and vocalization. Stimulation was given according to the infant feeding and sleep-time schedules. Infants were reviewed every month. It was emphasized that, aside from the training programs, the infant requires the affection and care of the family members.

Denver developmental screening test (DDST)

The Denver Developmental Screening Test is a simple, clinically useful tool for early detection of infants with developmental delay.[19] The test comprised of four domains: gross motor, fine motor/adaptive, language and personal social. The levels of achievement were scored as Advanced, ok/pass, caution and fail depending on the age line.[20] The milestones assessment was done according to the corrected age, often calculated prior to developmental assessment for a more accurate comparison of the developmental status. [4] The date of assessment and the infant corrected age were mentioned against each milestone.

Neurologic Examination

The Amiel-Tison [21] test was performed by a pediatric therapist, with the infant in awake but quiet. Hypertonia orhypotonia were looked for by measuring the adductorangle, popliteal angle, ankle dorsiflexion, and scarf sign. Any asymmetries between the extremities were recorded.

Data Analyses

The efficacy of the intervention strategies on achievement in various developmental domains at 4^{th}, 8^{th} and 12^{th} months for EI and NEI LBW infants was evaluated using Hotellings T2 test for equality of mean.[22] The effect of early intervention in improving the average level of achievement in all developmental domains in EI and NEI, at 4^{th} month and after 12^{th} month, the non-parametric test namely Kolmogorov – Smirnov test [23] for equality of means was carried out.

RESULTS

The age of each infant in both groups was corrected for comparison, and the last examination for the objectives was performed at 12 months of corrected age. At the first examination, no differences in age, socioeconomic features, and examination results were observed. Significant differences between groups were observed with better performance in EI than NEI infants. In the initial assessment, infants of 86% were suspected of neurologic abnormalities, while 14% exhibited a normal result. Later at 12^{th} month of examination, in NEI infants 12.5% present a normal result, while 87.5% had suspicion of

neurologic abnormalities. In EI Group, all infants had a near normal result at 12th month of examination. Significant differences between groups were observed with better performance in EI than NEI. The efficacy of the intervention strategies on achievement in various developmental domains at 4^{th}, 8^{th} and 12^{th} months for EI and NEI LBW infants was evaluated. In order to compare the achievement in these developmental domains in both groups it was proposed to test the equality of the mean vectors using the multivariate test procedure, namely, Hotellings T^2test for equality of mean. H0: The average level of achievement in various developmental domains does not significantly differ between the different durations of intervention. The results are given in table 1.

Table 1: ***The equality of mean vectors and descriptive of four developmental domains in EILBW infants and NEI LBW infants at 4^{th}, 8^{th} and 12^{th} months***

Age of infants	Hotellings T^2	F statistic	Significance p
4^{th} month 8^{th} month 12^{th} month	14.376 24.189 23.404	100.633 96.758 93.614	0.000 0.000 0.000

The F statistics value with corresponding p value of 0 implies that the means of all the developmental domains differ significantly between the EI and NEI infants. The mean vectors of the four developmental domains differ significantly from 4^{th} to 12^{th} months. The values of the descriptive statistics i.e. mean and S.D for the four developmental domains in EI and NEI infants at 4^{th}, 8^{th} and 12^{th} months are given in table 2.

Table 2: ***The Descriptive statistics for the four developmental domains in EI and NEI infants at 4^{th}, 8^{th} and 12^{th} months***

Domains	EI infants		NEI infants	
	Mean	S.D	Mean	S.D
4^{th} Month				
Gross motor	1.3750	0.54006	1.3650	0.5397
Fine motor	1.3250	0.47434	1.3167	0.4691
Personal Social	1.3247	0.47389	1.1700	0.3798
Language	1.3219	0.47278	1.1750	0.3848
8^{th} Month				
Gross motor	2.3000	0.64847	1.6000	0.63246
Fine motor	2.2750	0.59861	1.4500	0.59700
Personal Social	2.0000	0.59914	1.1750	0.38481
Language	1.9500	0.59700	1.3000	0.51640
12^{th} Month				
Gross motor	3.1000	0.77790	1.9250	0.91672
Fine motor	2.9750	0.80024	1.5750	0.67511
Personal Social	2.6250	0.70484	1.2750	0.55412
Language	2.4500	0.67748	1.3500	0.57957

From the values of the descriptive statistics of the four developmental domains, it is observed that for infants who underwent EI, the average values of their developmental domains are greater when compared to that of NEI infants. To compare the difference between the average level of achievement initially at 4^{th} month and at 15^{th} month in all developmental domains in EI and NEI infants, the Kolmogorov-Smirnov test for equality of means was carried out. The results are given in table 3.

Table 3: ***Kolmogorov–Smirnov test for achievement in all developmental domains at 4th month and after 12 months in LBW infants***

Domains	At 4th month		After 12 months	
	Kolmogorov Z statistic value	p (Significance)	Kolmogorov Z statistic Value	p (Significance)
Gross Motor	0.449	0.988	3.184	0.000
Fine Motor	0.408	0.996	2.817	0.000
Personal	0.694	0.721	3.225	0.000
Language	0.694	0.721	3.470	0.000

From the table 3, it is observed that the Kolmogorov – Smirnov Z statistic value have a corresponding P value of > 0.05 at 4th month. So there is no significant difference between the average levels of achievement in all developmental domains for the infants in both groups. After 15 months the corresponding P value of < 0.05 and there is a significant difference between the average level of achievement in all developmental domains in infants of EI and NEI groups. It shows that the achievement in gross motor, fine motor, personal social and language domains differ between the two groups of infants.

DISCUSSION

We studied the effects of early intervention in selected sample of high risk infants. We found differences in developmental outcome between EI and NEI infants, with a better performance in EI infants. The study suggests a positive effect of EI on neurodevelopmental outcome in LBW infants. "Early" can be understood in several ways, for example:1) early after birth;2) early in the first year of life; and3) early after onset of the condition. Each intervention type is associated with advantages and disadvantages .Very early treatment are intervention provided for infants who are at risk for neuromotor disorders, and treated as soon as possible to minimize future handicaps.[24] CDC model of 'early stimulation therapy' was effective. The beneficial effect also persisted at 2 years, without any additional interventions. A reduction of 40% in poor performance could be achieved by EI in LBW babies in Trivandrum.[25] Various studies related to the developmental outcome of LBW infants, EI showed greater developmental progress in acquisition of skills, cognition, intellectual, social functioning and increased weight gain.[26,27] EI have been carried out in the NICU, after hospital discharge, or may initiate during the first semester of life.[28,29] Various studies suggested that children who were born prematurely are discharged from the NICU were still at risk for future developmental disabilities[30,31], this necessitates systematic monitoring, follow-up, and early intervention services. But in our study we began EI during newborn period itself before hospital discharge and continued during the first year of life by reviewing infants every month. NEI group were also advised to take EI for their infants, but they did not turn up. A difference in developmental items was observed when comparing infants under EI group with those of NEI group. The level of achievement in all developmental domains in EI infants is greater when compared to NEI infants. There is a significant difference in the level of achievement in the chosen developmental domains as the duration of intervention increases, greater at 12th month when compared to other durations. This implies the effectiveness of the early intervention given. In our study, EI therapy helps in the process of achieving higher level of achievement in gross motor domain, similar studies[29,32] is in agreement with our result.

CONCLUSION

Early intervention improved the neurodevelopmental outcomes of high-risk infants. The study suggests a positive effect of early intervention in the level of achievement of developmental domains in LBW infants. This method of intervention prevents disability of the child in future. Intervention is likely to be more effective and less costly when it is provided earlier in life rather than later.

CONFLICT OF INTEREST

Conflict of interest declared none.

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