

Level of Physical Fitness among Physiotherapy Students a Study of Punjab and Haryana

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Abstract: Physiotherapists are desired to have a good level of physical fitness to meet their job demands. As educators of Physical Therapy profession, it is important to expose students to their professional physical fitness demands that they would face in employment setting. The students of Bachelor of Physiotherapy programme from various colleges of Punjab and Haryana participated in the study. The data was collected using a structured questionnaire. The data collected related to perception of students on physical activity required in profession, the physical activities of students and their involvement in sports during campus life. The data was also collected regarding presence of any kind of musculoskeletal pains among respondents. The self perceived level of fitness was also ascertained. The measured levels of physical fitness was determined by using toe touch test, shoulder flexibility test, BMI, push-ups, wall squat test and Harvard step test. Out of 250 students who participated in the study only 47.6 percent perform physical exercises regularly. More than 50 percent of the students reported the presence of musculoskeletal pains. The majority of the students considered their self perceived fitness levels as normal for their age. On measured fitness level, maximum number of students had poor endurance and 23 percent students were underweight. However, the students performed good on flexibility and strength testing. The physical fitness level of students is not satisfactory as compared to the physical demands of the profession. The measured fitness levels are less than the perceived levels. There is a need to improve the fitness of physiotherapy students by making changes in the curriculum and teaching methodologies.

Key words: Physical fitness • Strength • Endurance • Perceived physical fitness • Harvard step test

INTRODUCTION

The professional demands of physiotherapy profession require the therapist to engage in activities which demand good amount of strength, endurance and flexibility. A reasonably high level of physical fitness is required to carry out the routine job activities of a physiotherapist. However, in the curriculum and academic experience no attention is given to the physical fitness of physiotherapy students. Therefore, as students of Physiotherapy, it is all the more relevant that they understand the demands of the profession and their actual physical fitness.

The functions performed by physical therapists in health care delivery system are diverse. The therapist works in hospitals with all varieties of patients.

The job involves transferring patients from beds to wheelchairs and gait training. They perform passive and resistive training with patients of all builds and disorders. In addition to hospital and clinic work the Physiotherapists are widely involved with sports teams and athletes. Physiotherapists are often looked upon by patients and athletes for guidance on how to enhance their physical fitness through the use of appropriate activities. Physiotherapists may also serve as role models for practicing healthy lifestyle behaviors. Therefore, they need to have a good level of physical fitness to meet their job demands. As educators of Physical Therapy profession it is important to expose students to the demands of the profession they have to face in their future employment settings.

The research evidence available on this subject show an increased prevalence of musculoskeletal disorders among physiotherapists as well as physiotherapy students [1-3]. One of the key reasons of this increase in musculoskeletal disorders could be reduced levels of fitness, which might lead to overstraining of various structures.

Physical fitness is an important part of human functionality related to health and wellbeing. In a typical definition of health-related physical fitness, many components are measured, such as cardio respiratory endurance, muscular strength and endurance, flexibility and body composition [4]. Self-perception of one's own physical fitness is a multi-dimensional phenomenon. The concept of self-perceived is usually divided into physical, emotional, cognitive and social areas. Previous researches were inconclusive on association between self perceived and measured physical fitness. Few studies report that there is no association between self perceived and measured physical fitness [5, 6]. Lamb (1992) reported higher and significant correlations between self-perceived and measured fitness [7]. Marsh and Redmayne (1994) reported correlations between self-perceived and measured fitness that for the endurance component was highest [8].

The present study makes an attempt to assess the perception of physiotherapy students towards the job demands, physical exercise and fitness. Further, the authors attempt to assess the, association between self perceived and measured fitness levels of physiotherapy students.

Methodology: The students of Bachelor of Physiotherapy from various colleges of Punjab and Haryana participated in the study. The data was collected using a structured questionnaire. The data collected related to perception of students regarding the physical activity required in their profession, the amount of physical activities and their involvement in sports during campus life. The data was also collected regarding presence of any kind of musculoskeletal pains among respondents. The self perceived physical fitness level was measured using a slightly modified version of a questionnaire by Delignieries *et al.* [9]. Delignieries *et al.* had adopted the four-factor model of perceived fitness identified by Abadie (1988) amongst adults and added a fifth, more general 'fitness' factor [10, 11] Measurement of physical fitness was done using common clinical tests which did not require any specific instrumentation. The flexibility was tested separately for upper and lower limb using toe touch and shoulder flexibility tests. [12, 13] Push up and

wall squat test was used to measure muscle strength. [14, 15] Harvard step test was taken as the measure of endurance and Body mass index was taken to assess body composition [16].

Data Analysis and Results: The data was analysed using SPSS version 12.0 software. The self perceived fitness level questionnaire was scored on a scale of 1 to 13 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 four categories as underweight, normal, overweight and obese. On the basis of toe touch test, the subjects were categorized into flexible and non flexible. The shoulder flexibility was categorized into excellent, good, average and poor. Both the strength tests were scored on a six point scale from very poor to excellent. The score of Harvard step test was categorized into five categories from poor to excellent. A total number of 250 students (35 males, 215 females) participated in the study. The mean age of males and females was 20.28 ± 1.93 and 20.38 ± 1.87 respectively. The results of the study are divided into four subsections i.e. perception of student regarding job demands and exercise, perceived levels of physical fitness of students, results of measured level of fitness and correlation between self perceived and measured level of fitness.

Perception of Students regarding Job Demands and Exercise

Perception on Activity Required: The perception of students on physical activity required by physiotherapy professionals was assessed using two questions. It was categorized on a scale of light to strenuous. The results show that 68.8 percent students consider that moderate amount of physical activity is required by a physiotherapist in fulfilling its daily job related activities. But, majority of the students agreed, that amount of physical activity required by physiotherapy students is heavier as compared to students of other programmes. 72.4 percent students rather consider that the physical activity is much heavier as compared to other courses.

Perception on Physical Exercise: Almost all the students understand the concept of benefits of physical exercise, but only 47.6 percent students actually involved in daily physical exercise. They consider that exercise in life is important to maintain good health and remain physically fit. From among them who do not do exercises, only 4.4 percent plan to start the same in near future. 55.2 percent of the students are involved in sports but they are not very regular with their sports.

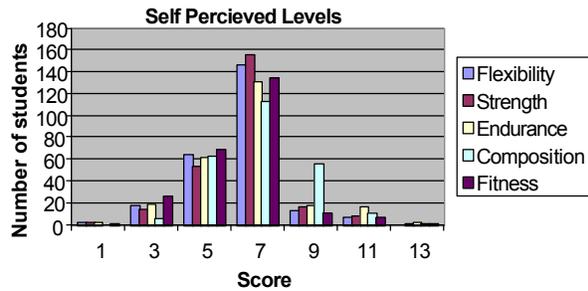


Fig. 1: Scores of Self Perceived Levels of Fitness

Musculoskeletal Pains: The presence of musculoskeletal pains was found to be fairly high among the students, with 58.8 percent reporting some or other type of musculoskeletal pain. There is a weak but significant negative correlation ($r = -.130^{**}$) between pain and exercise. However, there is no correlation between presence of pain and student’s involvement in sports.

Self Perceived Fitness Levels: To assess the self perceived levels of fitness, the questions were asked about flexibility, strength, endurance, composition and overall fitness levels. The data on the self perceived fitness level was scored on a scale of 1 to 13. Where 1 indicate extremely low score and 13 indicate maximum score. The scale was scored on odd values only from 1 to 13. More than 50 percent of students considered their fitness levels as normal or slightly below the average levels for their age. The data shows a positive perception of students towards their fitness levels. Table 1 and figure 1 represents the frequencies of students according to their scores of self perceived fitness levels.

Measured Fitness levels: Table 2 shows the descriptive statistics for male and female students for body composition, strength and endurance. According to BMI, 23.2 percent students lie in underweight category. 63.6 students have normal weight according to their height. Only 13.2 percent students are overweight or obese. In terms of flexibility testing toe touch test and shoulder flexibility test show two diverse pictures. According to the results of toe touch test 76.8 percent students had flexibility to touch their toes or remain atleast in the range of 10 cm above the toes. However, about 10 percent of students were able to touch their fingers with hands crossed behind the back. Upper limb strength measured with push up test presented a highly skewed picture (Table 3). Only 27.6 percent of the students were below average according to their upper limb strength. Similar findings were seen in the results of wall squat test, with 28.4 percent students below average strength (Table 4).

Table 1: Scores of Self Perceived Levels of Fitness

| Self Perceived Levels | | | | | |
|-----------------------|-------------|----------|-----------|-------------|---------|
| Scores | Flexibility | Strength | Endurance | Composition | Fitness |
| 1 | 2 | 2 | 2 | 0 | 1 |
| 3 | 18 | 14 | 19 | 6 | 26 |
| 5 | 64 | 53 | 62 | 63 | 69 |
| 7 | 146 | 155 | 130 | 113 | 134 |
| 9 | 13 | 17 | 18 | 56 | 11 |
| 11 | 7 | 8 | 17 | 11 | 7 |
| 13 | 1 | 2 | 1 | 1 | 1 |

Table 2: Descriptive Statistics

| | Males | Females |
|-------------------|-------------|-------------|
| | Mean± SD | Mean±SD |
| BMI | 22.23±3.11 | 20.96±3.72 |
| Push ups | 24.16±11.15 | 17.43±8.83 |
| Wall Squat | 50.96±27.54 | 43.56±28.22 |
| Harvard step test | 66.39±30.06 | 47.18±31.24 |

Table 3: Upper Limb Strength Measured by Push Up Test

| | Push up test | |
|---------------|--------------|---------|
| | Frequency | Percent |
| Very Poor | 2 | 0.8 |
| Poor | 26 | 10.4 |
| Below Average | 41 | 16.4 |
| Average | 87 | 34.8 |
| Above Average | 32 | 12.8 |
| Good | 34 | 13.6 |
| Excellent | 28 | 11.2 |
| Total | 250 | 100 |

Table 4: Lower Limb Strength Measured by Squat Test

| | Wall Squat test | |
|---------------|-----------------|---------|
| | Frequency | Percent |
| Very Poor | 30 | 12 |
| Poor | 30 | 12 |
| Below Average | 11 | 4.4 |
| Average | 18 | 7.2 |
| Above Average | 21 | 8.4 |
| Good | 30 | 12 |
| Excellent | 110 | 44 |
| Total | 250 | 100 |

Table 5: Cardiovascular Endurance Results Form Harvard Step Test

| | Harvard Step Test | |
|--------------|-------------------|---------|
| | Frequency | Percent |
| Poor | 167 | 66.8 |
| Low average | 12 | 4.8 |
| High average | 20 | 8 |
| Good | 12 | 4.8 |
| Excellent | 39 | 15.6 |
| Total | 250 | 100 |

Table 6: Correlation between Self Perceived and Measured Level of Fitness

| | Self Perceived | | | |
|----------------------|----------------|-----------|----------|-------------|
| | Composition | Endurance | Strength | Flexibility |
| BMI | -0.581** | | | |
| Harvard step Test | | 0.055 | | |
| Push up | | | 0.128* | |
| Wall Squat | | | 0.178** | |
| Shoulder Flexibility | | | | -0.026 |
| Toe touch test | | | | 0.215** |

*significant at p< 0.05

** significant at p<0.01

The most surprising are the results of endurance testing measured by using Harvard step test. 66.8 percent of the students were found to have poor levels of endurance (Table 5).

Correlation Between Self Perceived and Measured Levels of Fitness: The correlation of self perceived fitness and measured values were most significant for the BMI and body composition. This shows that the students have a relatively good idea about their body type. There is also significant correlation between the tests of strength measurement and perceived levels of muscle strength. For the flexibility component there is a significant correlation of perceived fitness with toe touch test but the results are not significant for the association between self perceived flexibility and shoulder flexibility test.(Table 6)

DISCUSSIONS

The results of the present study show that the students have agreed that the physical activity required in physiotherapy profession is heavier as compared to any other course, but they do not consider it to be too strenuous or physically tiring. Almost all the students understand the benefits of physical exercise, but more than 50 percent of the students do not exercise. The main reasons cited by students are lack of time for regular exercise and lazy attitude. Again 50 percent of the students are engaged in sports. Most common games played by physiotherapy students are football, cricket, badminton and volleyball. The percentage of physiotherapy students having musculoskeletal pain is very high. This trend is alarming and need attention. The most common areas of pain are neck, low back and shoulder. Less prevalent are the pains in knee and ankle. A study on physiotherapy students of Australia has shown an increased prevalence of low back pain [17].

Further research is needed in this field to bring out the causes and risk factors of these musculoskeletal pains.

The results show that the correlation between self perceived and measured fitness level is significant for body composition, strength and flexibility. The correlation is not significant for self perceived endurance and Harvard step test. While most of the students consider their endurance level to be normal to above average, the results of Harvard step test show that most of the students have poor level of endurance. Huotari *et al.*, (2009) reported correlations between the self-perceived and measure physical fitness were non-significant [18]. But, in contrast Mikkelsen *et al.*, (2005), shows that subject can estimate at group level their fitness [19], also Magnus *et al.*, (2004) reported correlations between the self-perceived and measure physical fitness were significant [20].

The measured level of fitness shows some interesting findings. More than 20 percent of students are in the underweight category. This brings out the need for development of an awareness programme for the students towards proper body composition.

Interestingly, the flexibility testing results show good flexibility in toe touch test but poor flexibility in performing flexibility testing of shoulder joint. More than 50 percent of the students have poor shoulder flexibility. The lack of flexibility in shoulder of physiotherapy students needs special attention. This may become a risk factor for the musculoskeletal disorder. One of the major causes of this reduced flexibility may be faulty posture. There is a need to explore the major factors affecting shoulder flexibility.

The poor level of endurance of physiotherapy students is also an important cause of concern. Endurance is very important to fulfill the workload and demands of physiotherapy profession. Even the academic activities require long standing hours during practical sessions and clinical training.

Physiotherapy is a profession which requires physical activity and adequate level of physical fitness. The fitness levels required by the physiotherapy professionals are high due to professional demands and also because physiotherapy professionals are projected as fitness experts in the society. The students perceive their fitness to be of the normal level, whereas, the measured fitness shows different results. The measured level of fitness is lower as compared to the perceived levels. Also, the presence of musculoskeletal pains in physiotherapy students is alarming. These findings indicate towards the need of

developing a fitness culture among the students. The attitude towards physical fitness is required to be developed among students. The ultimate goal of physiotherapy education is to prepare students for the job of a physiotherapist. Thus, achieving a good amount of fitness level should be the goal of curriculum. It may not be reflected in the syllabus, but to be the part of hidden curriculum. Thus, it becomes the responsibility of the educators of physiotherapy to develop the awareness and attitude of physiotherapy students towards physical fitness and exercise.

CONCLUSION

The physical fitness level of physiotherapy students is not satisfactory as compared to the physical demands of the profession. The measured fitness levels are less than the perceived levels. There is a need to improve the fitness of physiotherapy students by making changes in the curriculum and teaching methodologies. To implement the things effectively, it may be recommended that physical fitness of students must carry some weightage in the evaluation process during the course of studies.

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