



PHYSICAL FITNESS VARIABLES REQUIRED FOR PRE-SERVICE TEACHERS

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Abstract:

This study undertaken to identify which physical fitness variables are involved while pre-service primary teachers (PSPT) perform their teaching-learning activity. A qualitative research approach was adopted in this study. Ten classes of PSPT were observed during their internship program. During observations it was documented that PSPT were unknowingly engaged themselves in different physical movements such as sit-ups, bending, squatting, sitting, standing, sitting on toes, hand raise, walking, dancing movements, and neck movements etc. All of these physical movements everyone performs on regular basis but with quite less frequency and intensity. Those who engaged in teaching-learning process have to do these movements in higher frequency and intensity as observed by the investigator. Consequences of increased frequency and intensity of these movements are physical and mental fatigue which subsequently hampers the performance of PSPT. As every movement is associated with different physical fitness variables, thus a matching exercise with consultation of experts was performed. The most dominant variables were identified as- strength endurance of legs, shoulders, back and calf; flexibility of hip, cervical, spine and shoulders; and coordination of leg & hand.

Keywords: identification, physical fitness, pre-service, primary teachers

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1. Introduction

Teaching is one profession which is considered amongst the most demanding occupation. A teacher is expected to be sound in all aspects of life- it could be physical, mental, emotional, social, academic etc. As researches reflect that five to twenty percent of all teachers who are not able to perform at par with their ability is due to lack of physical fitness (Castelli, Hillman, Buck, & Erwin, 2007).

It is evident that in Indian schools only students' health and fitness is given due emphasis, and teacher's health and fitness are never considered having any importance for promotion of schools. Indian education system ensures that every student gets proper balance diet as well as health instruction. This is reflected in the academic text books and curriculum of the schools.

A study conducted by Varghese and Nair (2017) documented that a teacher who is having a sound work and life balance, has more energy and is likely to serve as a healthy lifestyle role model for their students. Teachers who are healthy and aware about physical fitness promote healthy behaviours and practices among students.

Pre-service teachers are university or college students who are getting training to become teachers in their later life. During their training, pre-service teachers have the opportunity to develop coping skills in their practicum, and other school related activities. This is the period during which they are charged with the responsibility to practice the skills of teaching in real world settings.

The basic responsibility of a teacher is to facilitate teaching and learning amongst their students. It is a common practice for primary teachers to teach almost 5 or 6 classes continuously with a very short period of break. To be able to stand and teach with desired quality continuously for such a long period of time needs a high fitness standard. As observed mostly, teachers except few do not engage themselves for any sort of physical fitness program. This physical inactivity or negligence for physical fitness by the teachers results in poor health and fitness.

Many researchers suggested that academic performance has a positive relationship with physical fitness (Coe, Pivarnik, Womack, Reeves, & Malina, 2006; Carlson et al., 2008; Howie & Pate, 2012; Shephard, Volle, LaVallee, LaBarre, JeQuier, & Rajic, 1984; Shephard, LaVallee, Volle, LaBarre, & Beaucage, 1994; Sibley & Etnier, 2003; Shephard, 1997; Tomporowski, 2003). Same is applicable with teachers too if a teacher keeps or maintains their health and physical fitness standard high then he/she will be able to give the best out of their capacity.

Despite the fact that health and fitness plays an important role in promotion of academic performance, no one is talking or considering the health and fitness of our teachers. Do our teachers need any fitness program? Does their health or fitness

influence student's health or fitness in any manner? No one is bothered to think or work on this. If teacher's health and fitness have any impact on students, then how? These questions need to be answered with the help of scientific research. Thus, this study is an attempt to identify those physical fitness variables which is required by our primary teachers during their classroom teaching. The findings will help us to guide and train our primary teachers to improve the standard of their physical fitness.

2. Methods and Materials

In this study, a qualitative approach was adopted. The details of the procedure are described below:

2.1 Literature Survey

This kind of work is unique in nature. Before this no one is attempted this type of work, hence primarily a survey was conducted to review the existing literature on physical fitness variables. Based on that, a tentative procedure was drawn to work on.

2.2 Procedure of Data Collection

The survey of literature suggested that the observation schedule is the prime source of data collection in any qualitative work, hence classroom observations were performed.

2.2.1 Observations

Observation of 10 classes of primary schools were done, where investigator tried to note down what type of physical activity performed by the respective teachers when they were teaching in the class.

2.2.1.1 Observations Sheet

S.N.	Type of movement	Frequency	Duration	Intensity
1	----	----	----	----
2	----	----	----	----
3	----	----	----	----

When the observation schedules were done, workshops were conducted to check and finalize the findings of the observations.

2.2.2 Workshop Meet

Two Workshop meets were conducted, where the expert in the field of education, physical education and physical fitness was called to discuss on the required physical fitness variables for primary school teachers.

2.2.2.1 Proceedings of the 1st Workshop Meet

The first workshop was held in the month of September, 2017. The resource persons were briefed about the aims and objectives of the study. The detailed findings of the observations and listed physical fitness indicators are placed before the experts for identification of the associated variables of physical fitness. The outcomes of classroom observations were like the pre-service teachers teaching about 5 hours continuously with only a 30 minutes break, and during these teaching hours pre-service teachers hardly get any change to sit, in fact many school didn't have any provision of chair for these teachers. The other observations were the pre-service teachers have to bend, squat, walk, raise their hands and perform other movements several times in the class unknowingly. Other symptoms of physical as well as mental fatigue were also shown in these teachers.

The experts discussed and tried to find out the variables associated with these activities. However, for finalization of the physical fitness variables they suggested one or two more observations are required in a more specific way such as- the observers should send to the schools with an observation sheet in which identified activities are listed in a tabular format, thus at the end the observer will have a frequency, duration and intensity of moments. This, in turn helps to find out the prominent activities performed by the pre-service teachers. On the basis of that, a matching exercise could be done to finalize the variables.

2.2.2.2 Proceedings of the 2nd Workshop Meet

The second workshop was held one month later. Whatever suggestions received by the experts from the 1st workshop were incorporated and presented.

Resource persons discussed on each component of observation one by one, simultaneously matching of associated variables were performed in light of related literature.

The major suggested variables required for pre-service teachers are- lower back strength, knee-hip flexibility, leg strength, strength and endurance of calf muscle, shoulder flexibility and coordination, lumber flexibility, leg-hand coordination, hip flexibility, cervical flexibility, and arm strength & endurance.

3. Results

The findings of the scheduled observations were as follows:

Table 1: Summery of classroom observation

Class Observed	Primary (Nursery to 5 th Standard)
Number of Periods Observed	10
Duration of Periods	35 Minute
Average Number of Students in the Class (Class Size)	42
Type of School	Govt. School

Table 2: Frequency of the movements which were performed
by the in-service teachers during teaching-learning process

S. No.	Movements	Average Frequency of 3 Schools	Total Frequency (Total of School Hours 5 Periods/day)
1.	Squatting	12	60
2.	Sitting on Chair/ Bench	3	15
3.	Standing	8	40
4.	Sitting on Toes	26	130
5.	Hand Raise (While writing on BB)	10	50
6.	Bending	21	105
7.	Walking	20	100
8.	Movement in Role Play (Story Telling) Form/Types: Dancing movements Duration: 5 Minute with 4 to 5 times repetition Intensity: Low, but sometimes rapid movements were also performed	5	25
9.	Neck Movement (Head Up and Down or Sideward movement)	18	90
10.	Holding or Showing Teaching Aid	5	25
11.	Making Line of the Students		4

Figure 1: Average frequency of movements performed by the teachers

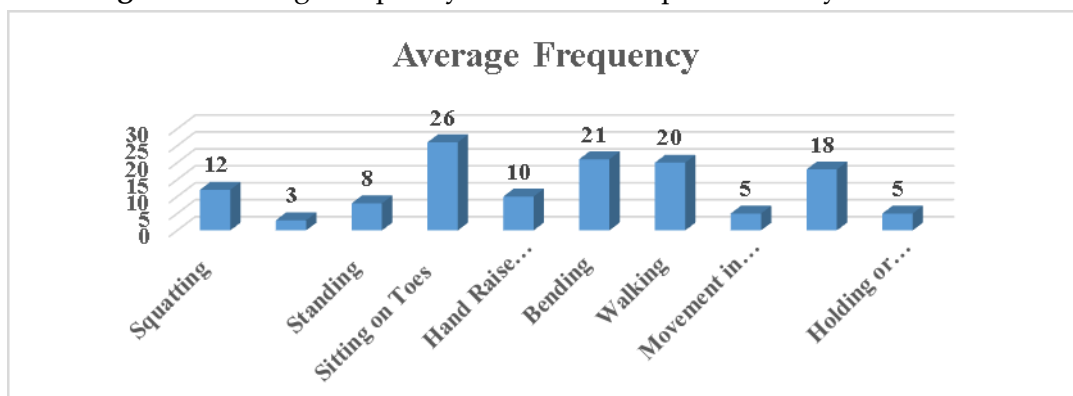


Figure 2: Showing total frequency of movements performed by the teachers

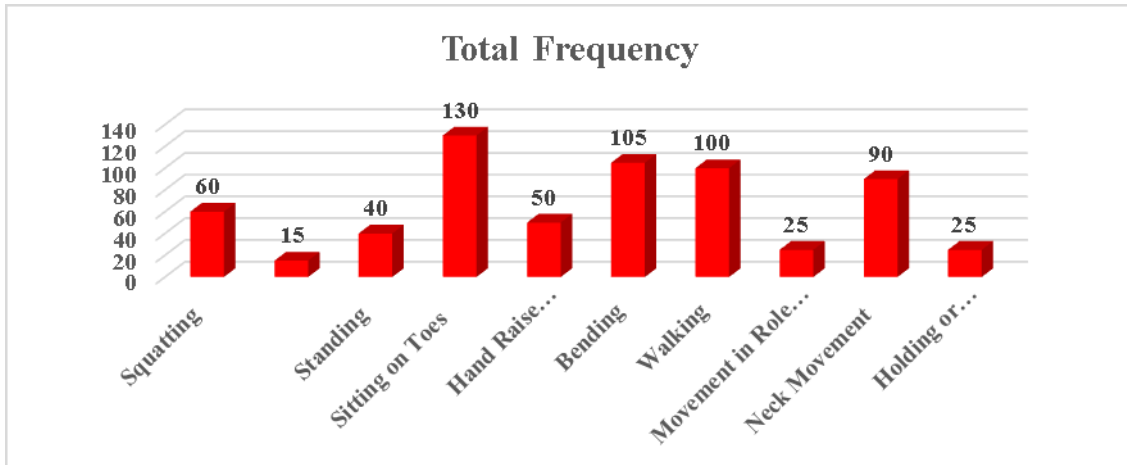


Table 3: Results of the matching exercise i.e. association of variables with different movements

S. No.	Movements	Associated Variables
1.	Squatting	Leg Strength, Lower Back Endurance (<i>Rissanen, Alaranta, Sainio, & Härkönen, 1994; Yehoyakim, 2015</i>).
2.	Sitting on Chair/ Bench	Lower Back Strength, Hip & Knee Flexibility, Leg Strength (<i>Gupta, Christiansen, Hallman, Korshøj, Carneiro, & Holtermann, 2015; Babski-Reeves, & Calhoun, 2016; Human Factors and Ergonomics Society, 2015</i>).
3.	Standing	Strength Endurance, Strength Endurance of Calf (<i>Halim, Omar, Saman, & Othman, 2012; Garcia, Laubli, & Martin, 2015</i>).
4.	Sitting on Toes	Strength Endurance of Calf, Spine Flexibility (<i>Simonsen, 2014; Wang, Weiss, Haggerty, & Heath, 2014</i>).
5.	Hand Raise (While writing or using Black Board)	Shoulder Flexibility, Shoulder Coordination (<i>Kronberg, Nemeth, & Brostrom, 1990; Gopura, Kiguchi, & Horikawa, 2010</i>).
6.	Bending	Lumber Flexibility (<i>Arnold, Anderson, Pandey, & Delp, 2005; Nuamann, 2010</i>).
7.	Walking	Leg-Hand Coordination, Balance, Hip Flexibility (<i>Stansfield & Nicol, 2002</i>).
8.	Movement in Role Play (Story Telling)	Dynamic Body Coordination (<i>Zajac, 1993</i>).
9.	Neck Movement (Head Up and Down or Sideward movement)	Cervical Flexibility (<i>Kamibayashi & Richmond, 1998</i>).
10.	Holding or Showing Teaching Aid	Arm Strength and Endurance, Shoulder Flexibility (<i>Kronberg et al., 1990; Gopura, et al., 2010</i>).
11.	Making Line of the Students	Leg-Hand Coordination, Balance, Hip Flexibility (<i>Arnold et al., 2005; Nuamann, 2010</i>).

Following observations are made on the basis of activities performed by the teachers during their classes:

- The school hour is about 5 hours with only 30-minute break in primary schools.
- During these 5 hours teachers hardly get any change to sit, in fact many schools don't allow their teachers to sit while they are involved in teaching learning process.
- Teachers have to check student's note book at least 7 to 10 times for one subject only for this they have to bend every time. Many pre-service teachers were complained they are having back-pain.
- It was observed during these 5 hours teachers roam in the class about 1 to 2 km unknowingly.
- It was also observed in the early hours of the class, teachers look very energetic but as time passes, their movement become slower with less frequency.
- The quality and clarity of voice are also changes as time passes.
- In the last periods most of the observed teachers loses their patience and get irritated very easily.

4. Discussion

This study was undertaken to identify which physical fitness variables are required for pre-service teachers to perform their teaching-learning activity efficiently without physical and mental fatigue. During observations it were noted that pre-service primary teachers were engaged in different physical movements and they did not have any idea about that. The physical movements in which they were engaged are- sit-ups, bending, squatting, sitting on chair/bench, standing, sitting on toes, hand raise, walking, dancing movements, neck movement (head up and down or sideward movement), and holding or showing teaching aid. All these physical movements one performs on regular basis with very less frequency and intensity, but when one engaged in teaching and learning process they have to do these movements in higher frequency and intensity as observed. As frequency and intensity of these movements enhanced its result in fatigue and subsequently hamper the performance of primary level pre-service teachers. Thus it has to be understand at what degree one muscle group could get fatigue when a particular movement is performed on repeated basis is seems important.

Several movements were performed by PSPT amongst that one was squat. In fitness, the squat is a complex full body movement that involves thighs, hip, quadriceps femoris, and hamstrings. Continuation of these movement result in shaping and strengthening the lower body (Rissanen et al., 1994). As the benefits of the squats, movement is more that demands more energy which ultimately results in fatigue in that

muscles (Gupta et al., 2015; Babski-Reeves & Calhoun, 2016; Human Factors and Ergonomics Society, 2015). Pre-service teachers are doing squats without knowingly thus, they get fatigue very easily. It is important to train teachers too for better performance (Yehoyakim, 2015).

The other most frequent body posture of PSPT was standing. Research in the area identified calf muscles, hamstrings and quadriceps muscles groups are required for standing for long duration. Muscles balancing is also requires for standing for such a long duration (Stansfield & Nicol, 2002). As standing also demands the involvement of lots of big muscles and when someone is not trained enough for that, he/she may very easily get tired. This seems in pre-service teachers too (Halim et al., 2012; Garcia et al., 2015).

Bending from the hip joint was also a very frequent movement which was observed in the study. Bending down brings two points on the front of our body, our torso and our legs closer together (Kronberg et al., 1990; Gopura et al., 2010). This action stretches a variety of muscles on the back of your body (i.e. flexibility). The stretch occurs whether you are bending down to pick something up or if you are bending as part of an actual stretch. Any stretching for prolonged period of time results fatigue in that muscles group (Arnold et al., 2005; Nuamann, 2010). This is also observed during our observation.

As observed, there were lots of neck movement during classroom teaching. The neck muscles, including the sternocleidomastoid and the trapezius, are responsible for the gross motor movement of the head and neck (Kamibayashi & Richmond, 1998). They move the head in every direction such as- pulling the skull and jaw towards the shoulders, spine, and scapula. If one on regular basis moves their neck as found in this project get neck or cervical pain very easily. So, there is a need to strengthen muscles involved in this movement.

Observation of the PSPT documented that teachers do lots of shoulder movements. Although it may look simple, stretching (i.e. flexibility) your arms over our head requires a complex, coordinated movement of our whole shoulder girdle (Simonsen, 2014; Wang et al., 2014). Many muscles are involved in this action, including the rotator cuff muscles, the deltoid and the trapezius and serratus anterior muscles (Kronberg et al., 1990). One of the principles of sport training is proper rest, but here pre-service teachers did not get any chance for rest due to continue teaching (Gopura et al., 2010). When they did not get proper rest, their muscles get tired and when they ignored this tiredness the principle of overuse is applied, that results in decline in the performance.

For a happy and progressive school, it is important a teacher should be fit in all aspects of life. If teachers are physically and mentally fit, then they are more likely be

happy in their work position and display good attendance records. Thus, with the huge benefits that a physical fitness program offers, the teachers should look after their health and fitness to become catalysts in providing the stability and continued development in the school.

5. Conclusion

Findings of the observations documented lots of different movements were performed by the pre-service primary school teachers during teaching-learning process. As every movement required different physical fitness variables, here in this study on the basis of the observations and workshop conducted with experts in the field following most dominant variables were identified:

- Strength Endurance of Legs, Shoulders, Back and Calf,
- Flexibility of Hip, Cervical, Spine and Shoulders, and
- Coordination of Leg and Hand.

The present study was confined to study the associated and significant physical fitness variables required for pre-service primary teachers. Since researches and explorations are not the end in itself, but merely open the way for future investigations. Similarly, the present work is not the end in this area. In fact, all the variables can never be studied in a single research. The results of the present study led to certain possibilities for further researches.

- a) Strength Endurance of Legs, Shoulders, Back and Calf, Flexibility of Hip, Cervical, Spine and Shoulders, and Coordination of Leg and Hand are the variables which required to train on higher degree for better utilization of teachers as a teaching-learning resource.
- b) Teacher education institute must focus to train their trainees on the above cited variables, if possible.

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