

An Investigation Into Health Related Physical Fitness among Physiotherapists

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Abstract

Background: Physical fitness is the ability to carry out daily tasks with vigor and alertness without undue fatigue and ample energy to enjoy leisure time pursuits and meet unforeseen emergencies.¹A number of measurable components contributes to physical fitness. The most frequently cited components are health and skills related that pertain to athletic ability. The health-related components of physical fitness are (a) cardio-respiratory endurance, (b) muscular endurance, (c) muscular strength, (d) body composition, and (e) flexibility.²

Physiotherapists work with people of all ages to bring about improvements in their health and independence. Physiotherapists provide exercise prescriptions to help people keep fit and achieve/maintain a healthy weight. Literature has indeed suggested that Physiotherapists are particularly susceptible to WRMDs (Work Related Musculoskeletal Disorders) because of the nature of their profession which is often repetitive, labor intensive and involving direct contact with patients. Physiotherapist helps people to be physically fit but are they themselves physically fit? Through this research we are trying to investigate level of physical fitness in physiotherapists using various health related physical fitness tests.

Method: 44 Physiotherapists participated in the study. The data was gathered at MGM School of Physiotherapy, MGM College of Physiotherapy and includes post graduate students, academicians and clinical therapist ranging between the age group of 22-40years. The subjects with any higher function deficits, musculoskeletal impairment, traumatic injuries, vascular impairments, and systemic inflammatory disorders were excluded from the study.

The participants were provided oral and written overview of study. Each participant signed an informed consent form prior to participation in study. The total time taken to complete tests by the subject was maximum 15 minutes.

Conclusion: This study reported reduced level of health related physical fitness among Physiotherapists.

Key words: *Physical fitness, Work Related Musculoskeletal Disorders.*

Introduction

Physical fitness is the ability to carry out daily tasks with vigor and alertness without undue fatigue and ample energy to enjoy leisure time pursuits and meet unforeseen emergencies.¹A number of measurable components contributes to physical fitness. The most frequently cited components are health and skills related that pertain

to athletic ability. The health-related components of physical fitness are (a) cardio-respiratory endurance, (b) muscular endurance, (c) muscular strength, (d) body composition, and (e) flexibility.²

Cardio-respiratory (CR) endurance is the efficiency with which the body delivers oxygen and nutrients needed for muscular activity and transports waste

products from the cells. Muscular strength is the greatest amount of force a muscle or muscle group can exert in a single effort. Muscular endurance is the ability of a muscle or muscle group to perform repeated movements with a sub-maximal force for extended periods of times. Flexibility is the ability to move the joints or any group of joints through an entire, normal range of motion. Body composition is the percentage of body fat a person has in comparison to his or her total body mass.¹

Regular physical activity and/or exercise improve cardiovascular and respiratory function reduces coronary artery disease & decreases mortality and morbidity. Higher activity and/or fitness levels are associated with lower incidence rates of combined cardiovascular diseases, coronary artery disease, cancer of the colon, and type 2 diabetes. It also decreases anxiety & depression, enhances feelings of well-being, performance of work, recreational, and sport activities.¹

In case of coronary heart disease, there is unanimity that protection is gained from both regular aerobic activity and from a high level of aerobic fitness. Regular physical activity also reduces symptoms, improves function and mortality and subsequent to myocardial infarction.^{15,1}

Prospective studies have suggested that a 6-month period of endurance training can correct much of the accumulated morbidity in the patient with end-stage renal disease, including hypertension, an adverse lipid profile, a poor glucose tolerance and muscle weakness. There is good cross-sectional and prospective evidence that a sedentary lifestyle increases the risk of developing Type II diabetes mellitus, and an increase of physical activity can improve insulin sensitivity. Degenerative diseases, heart disease, hypertension, diabetes, and cancer have become the major causes of death if inactivity stays for long time. Overuse or repetitive trauma injuries are on the rise as the population becomes less active.¹⁶

There are many risk factors which contribute to low level of physical fitness. Heredity was seen as having a potential to influence habitual physical activity, health-related fitness, and health directly. Smoking, diet and alcohol consumption has weak influences on fitness and health status. Combination of socio cultural, economic factors also attribute to individuals participation in physical activity. Factors like air temperature, humidity,

air pollutants not only contribute to person's willingness to physical activity but also the person's response to physical activity.¹⁵

Various tests are used to assess the components of fitness. Cardio respiratory endurance can be assessed by step test, 1.5mile walk test, 1mile run test, 6min walk test etc. Muscular strength is assessed by hand grip strength, one RM etc. Muscular endurance is assessed by sit ups, curl ups, push ups, YMCA bench press test. Flexibility is assessed using sit and reach test, modified sit and reach test. Body composition is calculated using the height, weight, waist hip ratio and skin fold measurement.^{1,9}

Physiotherapists work with people of all ages to bring about improvements in their health and independence. Physiotherapists provide exercise prescriptions to help people keep fit and achieve/maintain a healthy weight. Studies have indicated that Physiotherapy treatments have a major impact on conditions such as back and neck pain. Physical activity provided under the guidance and supervision of a Physiotherapist reduces the risk of heart attack, stroke, type 2 diabetes, colon cancer and breast cancer. Despite limited numbers of Physiotherapists in some countries around the world, they have proved their effectiveness at getting and keeping people healthy³.

Literature has indeed suggested that Physiotherapists are particularly susceptible to WRMDs (Work Related Musculoskeletal Disorders) because of the nature of their profession which is often repetitive, labor intensive and involving direct contact with patients. Younger therapists reported a higher prevalence of WMSDs in most body areas. Use of mobilization and manipulation techniques was related to increased prevalence of thumb symptoms. Risk factors pertaining to workload were related to a higher prevalence of neck and upper-back symptoms, and postural risk factors were related to a higher prevalence of spinal symptoms.^{4,5}

Physiotherapists have great potential for physical activity promotion. They prescribe exercises for a wide range of conditions (mostly musculoskeletal) requiring rehabilitation. Currently, physiotherapy is mainly a tertiary prevention discipline, but equipped with the ideal skills and

potential to act in a primary prevention role.¹⁷ Physiotherapist helps people to be physically fit but are

they themselves physically fit? Through this research we are trying to investigate level of physical fitness in physiotherapists using various health related physical fitness tests.

Materials and Methods

1. Study design: Descriptive. Study
2. Population: Physiotherapist
3. Target population: post graduate students, academicians and clinical therapist between the age group of 22-40years.
4. Sample size: 44 physiotherapists

5. Sampling technique: Convenience sampling

6. Materials used: Step test- 12inch stepper, metronome and stop watch, Hand held dynamometer Sit and reach box, Chair, Weighing machine & measure tape.

Result

The data collected from all subjects were coded and entered into Microsoft excel 2007 and statistically analyzed with SPSS version 16 statistical package. Demographic variables were analyzed for each group. Mean values were determined. Graphical representation of mean values and standard deviation was done

1. Table on Cardio respiratory endurance: The cardio respiratory endurance of male and female physiotherapist was poor when compared with the normal standards.

VO2 max	Present study			ACSM guidelines				
	Age 22-40	Mean	SD	Superior	Excellent	Good	Fair	Poor
Males (n=13)	38.1	5.6	56 +	51-55	46-50	42 -45	< 41	
Females (n=31)	35.5	4.9	50 +	44-49	40-43	36 -39	< 35	

2. Table on Muscular strength & endurance: Muscular strength and endurance in physical therapist needed improvement.

2.1 Table on Upper limb Muscle strength

Grip strength	Present study			ACSM Guidelines				
	Age22-40	Mean	SD	Excellent	Very good	Good	Fair	Needs Improvement
Males (n=13)	56.6	15.3	> 115	104 -114	95-103	84-94	< 83	
Females (n=31)	40.6	12.0	> 70	63 -69	58-62	52-59	< 51	

2.2 Table on Lower Limb Muscle Strength & endurance.

Sit to stand	Present study (Age22-40)			Normal adults		
	Mean		SD	Mean		SD
	Males (n=13)	14.9	3.3	Males (n=22)	17.7	2.4
	Females (n=31)	14.4	2.0	Females (n=17)	14.1	1.7

3. Table on Flexibility: Flexibility of male PTs was fair where else that of female PTs needs improvement.

Sit and reach	Present study			ACSM Guidelines				
	Age 22-40	Mean	SD	Excellent	Very good	Good	Fair	Needs improvement
	Males (n=13)	29.7	8.1	≥ 40	34-39	30-33	25-29	≤ 24
	Females (n=31)	27.3	8.2	≥ 41	37-40	33-36	28-32	≤ 27

4. Table on Body composition Body composition study reported that the subjects fall into the range of normal BMI

BMI	Present study			WHO classification (Asian)					
	Age 22-40	Mean	SD	Under weight	Normal range	Over weight	At risk	Obese class 1	Obese class 2
	Males (n=13)	22.1	3.1	≤ 18.5	18.5-22.9	≥ 23	23.0-24.9	25.0-29.9	≥ 30
	Females (n=31)	22.3	3.4						

Discussion

The present study was conducted to investigate the level of physical fitness in Physiotherapists. . Sample size of 44 subjects was recruited for the study.

Physical fitness is a dynamic construct which has growing importance to everyday life and health.¹ Physical fitness is divided into two health related physical fitness and skill related physical fitness. Health related fitness has five components namely cardio respiratory fitness, body composition, muscular strength, muscular endurance and flexibility. From the perspective of public health, the health-related components are more important than those related to athletic ability (or are skill-related or performance-related components).^{1, 2} All health-related fitness components contribute equally, or are in balance, to the whole of health-related physical fitness.

Physiotherapist work with people of all ages to bring about improvement in their health and independence. They provide exercise prescriptions to help people keep fit and achieve/maintain a healthy lifestyle. Adults need 30 minutes of moderate physical activity five days a week, or 20 minutes of vigorous physical activity three days a week along with muscle strengthening exercises at least twice a week to maintain health. Exercise, particularly aerobic conditioning and strength training, is one of the key interventions that can prevent death and disability from cardiovascular disease. Physiotherapists are experts in prescribing these as part of a structured, safe and effective program. Physiotherapists help people achieve and return to work, education, community participation and fulfilled lives.³

The work of Physiotherapist is physically demanding and often involves considerable amount of bending, reaching, twisting, and awkward positioning. Such activities increase loads on the lumbar spine.⁸ Time constraints, lack of assistance from staff members, and sudden maximal efforts while moving or supporting patients may further increase the risk of incurring LBP¹². Thumb problems are a common occupational hazard apart from back or neck pain for physiotherapists indulged in manual therapy due to work activities and techniques that repeatedly compress the thumb joints.^{4,}

5, 13

Sedentary lifestyle has a major impact on health related physical fitness. Sedentary behavior is associated with deleterious health outcomes, which differ from those that can be attributed to a lack of moderate to vigorous physical activity¹⁴.

1. Table on Cardio respiratory endurance shows that the Cardio respiratory endurance of male and female physiotherapist was poor when compared with the normal standards. Change in body composition, imbalance in lipoprotein lipase (LPL) activity can also cause decrease in cardio respiratory endurance¹⁴ Factors other than body composition and maximal heart rate (namely age related changes in maximal stroke volume and arteriovenous oxygen difference) were responsible for the greater rate of decline in VO₂max¹⁹

2. Table on Muscular strength & endurance showed that Muscular strength and endurance in physical therapist needed improvement, the effect of sedentary lifestyle causes a decrease in muscular strength and endurance due to decline in tension generating capacity of the muscle Decrease in energy stores , built up of H⁺ ions , insufficient oxygen reaching the muscle causing it to fatigue more fast , Decrease in conduction of impulses at the myoneural junction , particularly in fast twitch fibers can all contributed to decreased muscular endurance of the therapists¹⁸.

3. Table on Flexibility shows that Flexibility of male PTs was fair where else that of female PTs needs improvement. Physical inactivity causes the hamstrings and the lower back muscles to tighten, which leads to decreased flexibility. Decreased performance of activities of daily living causes the compliance of the capsule to decrease leading to decreased flexibility in the population.

4. Table on Body Composition shows that the subjects fall into the range of normal BMI. However continues reduced physical activity can leads to excessive adipose tissue deposition and less energy expenditure which can cause further lead to overweight and obesity which can further increase the risk of cardiovascular diseases in the long run.

This study definitely points out the need to perform exercises to maintain physical fitness even among Physiotherapists. Further studies can be extended by

implementing fitness programs in different set ups and assessment of fitness levels.

Conclusion: This study reported reduced level of health related physical fitness among Physiotherapists.

Conflict of Interest: NIL

Source of Funding: Self divided amongst us .

Ethical clearance: Institutional Ethical Committee Approval Taken for the Study.

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