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Prevalence of Work-Related Musculoskeletal Disorders (WMSD) among Physical Educators of Hyderabad

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Abstract: *Physical education is a comprehensive approach that involves educating physical activity to improve social, cognitive as well physical skills via bodily movements. Physical education teachers undergo higher levels of occupational physical activities and repetitive movements and are more prone to develop sports injuries and WMSDs. The aim of the study is to identify the prevalence of work-related musculoskeletal disorders among physical education teachers in Hyderabad. This study is a cross-sectional observational survey. 100 participants were recruited from different institutes in Hyderabad. Data was collected from the Nordic musculoskeletal questionnaire and data was analysed by SPSS software version 21.0. The results show that the prevalence of work-related musculoskeletal disorders among physical educators is in highest lower back pain (42%), followed by shoulder (36%) and neck (28%). This study concludes occupational musculoskeletal disorders are highly prevalent among physical education teachers in Hyderabad. Low back pain and shoulder discomfort has been more commonly reported.*

Key Words: Cognitive, Occupational, Nordic Musculoskeletal, Disorders, Shoulder, Hyderabad

Introduction

Physical education is a planned program of instructions and curriculum in the form of exercises and physical activity sessions provided to develop and enhance motor skills, core physical fitness level and sportsmanship. Physical education is a comprehensive approach that involves educating physical activity to improve social, cognitive as well as physical skills via bodily movements (Kohl III et al., 2013-A) Physical educators are those professional trainers who have a responsibility to train the students either in schools, gymnasium or other fitness centres to adopt a physically active lifestyle and teach skills to encourage their participation in physical fitness activities e.g. sports, games and exercises. Physical education teachers also work to enhance the cognitive and mental capability of students (Kohl III et al., 2013-B). The responsibilities of physical education teachers include the provision of maximum physical activity within limited class timings. A physical education teacher is also responsible to encourage participation in physical activities, to teach skills to be fit and active. One of the most important tasks of physical education teachers is to appreciate good participation and performance (Woolls B et al., 2005).

Musculoskeletal disorders or dysfunctions are injuries related to the musculoskeletal system including bones, ligaments, joints, tendons, capsules, discs, vessels and nerves. Musculoskeletal injuries are also termed overstress injuries or repetitive motion injuries. (Hadler NM, 2005)

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MSK disorders related to the workplace include acute or chronic MSK diseases or illnesses related to soft tissue injuries caused by work-related repetitive mechanical overload or disuse leading to joint degenerative changes like osteoarthritis, sprains, strains, low back pain or neck pain and disc degeneration etc. There are multiple risk factors associated with occupational problems affecting the musculoskeletal system. Static or long-term fixed positions, frequent and repetitive movements, forceful impact over a smaller body part or weak body part like hands or wrist or excessive workload beyond the strength of the body result in a painful condition of the MSK system. Physical educators are reported to be commonly presenting with musculoskeletal symptoms due to their highly demanding profession that causes physical as well emotional burnout. One of the important risk factors also includes improper training and overworking hours.(Kovač, Marjeta, et al., 2016)

MSK dysfunctions can be managed easily by physical rehab and conservative measures but sometimes they lead to chronic illness and require months to years to recover so prevention is more important than treatment (4) The physical education teachers undergo a higher level of occupational physical activities and repetitive movements as compared to other teachers. PETs are more prone to develop sports injuries as well as repetitive and forceful movements can also result in MSK pain and dysfunctions, so the prevalence of musculoskeletal symptoms is observed commonly in physical educators (Pihl, E., 2002).

Contributing factors to occupational MSK problems include the environment of the workplace, work demands on employees as well job-related stress leading to work-related diseases like musculoskeletal problems, stress, occupational burnout, chronic exhaustion and depression (Zoe R., 2008).

There are several factors that are responsible for MSDs in working personals including, 1) anatomy and physiology of the affected body part i, 2) associated risk factors, 3) lack of medical-legal implications, and 4) Improper preventive measures(Ana Claudia Souza RN et al., 2012)

Methodology

A cross-sectional study conducted and recruited 100 Qualified Physical education teachers with working experience of at least one year were included in this study including from different schools, colleges, gymnasiums and Universities of Hyderabad. Data was collected by distributing questionnaires among physical education teachers in different institutes along with the consent forms. The tool used for data collection was a Nordic musculoskeletal questionnaire for the analysis of musculoskeletal symptoms consisting of two sections. Section one included general information about the participant such as weight, height, working hours in a week and the number of the working year, section two was composed of closed-ended questions about the body regions where the participant would have experienced any pain or discomfort during last 12 months or previous 7 days and either that pain caused the participant to take off from job or routine work. Plain white paper was used for the questionnaires and all questionnaires were distributed in person to the participants. For the evaluation of data Statistical Packages for Social Sciences (SPSS) software, version 21.0 was used.

Results

Out of 100 participants, 67% were males and 33% of the respondents were females with a mean age of 34.26±7.32. Table number 1 shows the response to the question "Have you at any time during the last 12 months had trouble (such as ache, pain, discomfort, numbness) in any part of the body" 28% of participants marked "yes" they had pain in the neck and 72% marked "no". 36% marked "yes" they had pain in their shoulder, 11% of respondents marked "yes" they had pain in their elbow, 30% of the respondents marked "yes" they had pain wrist or hand, for upper back pain 21% marked "yes", or lower back pain 42% marked "yes", 12% of the participants reported pain in one or both thighs/hips/buttocks, 19 % marked "yes" they had pain in one or both knees and 15% of the participants reported pain in one or both ankles.

Table 1. Facing Trouble (such as Aches, Pain, Discomfort, and Numbness) during the last 12 Months

S. NO	Have you at any time during the last 12 months had trouble (such as aches, pain, discomfort, numbness) in	Yes (%)	No (%)
1	Neck	28	72
2	Shoulder	36	64
3	elbow	11	89
4	wrist/hand	30	70

5	upper back	21	79
6	lower back	42	58
7	one or both hips/thighs/buttocks	12	88
8	one or both knees	19	81
9	one or both ankles	15	85

Table number 2 shows the response to the question "Have you at any time during the last 12 months been prevented from doing your normal work (at work, housework, hobbies) because of the trouble in any part of the body?". Out of 100 respondents, 12% of the physical education teachers marked "yes" that they had a problem in carrying out their normal activities due to neck pain, 29% of respondents were compromised due to pain in the shoulder, hindrance in normal routine due to elbow pain was reported by 6% respondents, 17% participants responded they had trouble in hand or wrist caused a disturbance in working routine, 12% participants responded they had discomfort in the upper back led to disturbance in daily activities, 24% participants responded they had lower back pain caused prevention from routine works, 7% of physical education teachers who marked that they could not work properly due to pain in one or both thighs/hips or buttocks, 12% reported that their normal activities were restricted by pain one or both knees and 4% reported that their normal activities were restricted by pain one or both ankles.

Table 2. Prevented from Carrying out Normal Activities (eg. Job, Housework. Hobbies) because of this Trouble during the last 12 Months

S. NO	During the last 12 months have you been prevented from carrying out normal activities (eg. Job, housework. Hobbies) because of this trouble in	Yes (%)	No (%)
1	Neck	12	88
2	Shoulder	29	71
3	elbow	6	94
4	wrist/hand	14	86
5	upper back	12	88
6	lower back	24	76
7	one or both hips/thighs/buttocks	8	92
8	one or both knees	12	88
9	one or both ankles	4	96

Table number 3 shows the response to the question "Have you had any trouble during the last 7 days in any part of the body?", 26% marked "yes" they experienced neck trouble during the last week, 6% had trouble in the shoulder, 6% suffered from elbow discomfort, 14% of the physical educators had trouble in the wrist or hand, 19% of participants experienced the upper back trouble, 39% participants experienced the lower back trouble, 13% participants experienced the trouble in one or both hips/thighs/buttocks, 19% experiences in one or both knees and 16% of participants experience trouble in one or both ankle during last days.

Table 3. Trouble during the last 7 days

S. NO	Have you had trouble during the last 7 days in	Yes (%)	No (%)
1	Neck	26	74
2	Shoulder	6	94
3	Elbow	6	94
4	wrist/hand	14	86
5	upper back	19	81
6	lower back	39	61
7	one or both hips/thighs/buttocks	13	87
8	one or both knees	19	81
9	one or both ankles	16	84

Discussion

This study is to be conducted to find out the occupational musculoskeletal problems prevalent among physical education teachers of Hyderabad that is being one of the common health issues developing among physical educators. So this study will enhance the awareness of the Department of Sports and physical education as well as of other managing authorities to develop policies and introduce preventive measures that would be financially beneficial for both the physical educators and the hiring authorities in terms of a decrease in health care expenses and reduced rate of absenteeism. This study is also significant because no such survey has ever been done to focus on the occupational health problems of physical education teachers in Hyderabad. The prevalence of occupational musculoskeletal problems is one of the significant issues among physical education teachers disturbing their professional lives so this study highlights the incidence of most common work-related musculoskeletal problems among physical education teachers of Hyderabad that would increase the knowledge of physical educators regarding most common symptoms and its management as well prevention. This will also contribute to physical therapy knowledge in better management of commonly prevalent MSDs to increase the efficiency of services.

a study to identify the prevalence of musculoskeletal problems among physical education teachers especially symptomatic osteoarthritis of the knee as well as hip and whether they differ from the normal population or not and findings that the prevalence ratio of symptomatic knee OA (male: 2.8 and female 3.2) and knee injuries was higher among PETs than the general population and the hip OA ratio in females was 2.7. Due to musculoskeletal disorders increased absenteeism and discontinuation of the job were highly observed.(Helen Sandmark,2000)

In the comparison of occupational physical, leisure time physical activity and musculoskeletal problems among male physical education teachers with their fellow workers, male physical education teachers had more active lifestyles as compared to other teachers, 59.3% were active in their leisure time and the risk of developing musculoskeletal problems was seen less in comparison to other fellow members. (E.Pihl et al., 2002)

The chronic health problems found among both male and female physical education teachers of Solvenia included: (1) Cervical spine disorders: male =19.5% & female =26.9% (2)Lower back pain: male=49.2%& female=49.4% (3) Hip, knee and ankle disorders: male=7.2%,25.9%,25.3% & female=9.3%,19.1%, 20.7% (4)Wrist, elbow and shoulder disorders: male=7.9%,11.7%,21.9% & female = 9.8%, 6.7%, 23.0%. A detailed prospective study of the working environment and factors affecting the health of physical education teachers is suggested. (Marjeta Kovac et al., 2013)

A study identifies work-related health issues, traumatic injuries, their causes and mechanisms among physical education teachers. The findings of the survey were that the rate of acute injuries was 0.55/teacher/year,(0.65/female/year and 0.51/male/year) and the occurrence of chronic injuries was higher among older physical educators and the main cause of occupational injuries was long term standing and sustained positions. It was suggested by this study that to find out ways to reduce long-term standing and sustained positions can help in minimizing the rate of injuries(Jean Lemoyne et al., 2007)

In the Comparison the rate of musculoskeletal injuries between Physical education teachers and nonphysical education teachers. physical education teachers had 1.23 injuries/teacher/year and non-physical education teachers had 0.78 injuries/teachers/year and the history of injury among physical education teachers was more extensive, with higher workload and higher sports participation. The rate of injuries in physical educators versus nonphysical education teachers in terms of percentage was expressed as, Inflammatory conditions (PE:21%, Non-PE: 24%), Sprain(pe:7%, Non-PE: 8%), Strain(PE:16%, NON PE:13%), Joint nerve and capsule problem(PE:11%,7% NON PE:13%,5%), Fracture and dislocation(PE:5%,0% NON PE:6%,15), Contusion(PE:5%, NON-PE:3%). The more commonly involved body parts of PETs were the knee and the back. This research proposed that preventive measures should be taken to reduce the risk of work-related injuries among physical education teachers (Lennert Goosens., et al., 2016)

Prevalence of work-related lower back pain and factors affecting it among the physical education teachers of Athens in 2004 through a questionnaire conducted. The occurrence of LBP was 63% according to the analysis and the most common factor associated with it was lack of proper training in physical education(odds ratio 2.5) and certain occupation-related factors such as lifting(odds ratio 2.6), assisting students in flexing postures(odds ratio 3.0), and excessive working time 35hours or more /week (odds ratio2.5) contribute to LBP. This study

recommended that improving the working environment and conditions can prevent LBP among physical education teachers(Stergioulas A et al., 2003)

in order to figure out the various types of serious profession-related injuries among Slovenian physical educators throughout their working life in relation to age, sex and teaching levels as well as other factors that cause dysfunction and affect their working abilities related data was conducted. According to the study, the number of injuries among males was 1.8 times higher than females and lower extremities injuries were spotted commonest type in both genders findings expressed in percentage as Ankle and foot injuries (male:32.0%,female:23.9%), knee injuries (male:20.9%,female:15.6%), upper limb and shoulder injuries(male:12.6%,5.8%, female:9.4%,2.2%), lower back and neck disorders(male:7.9%,female:10.6%). Further study was prescribed in order to make safety and precautionary measures for work-related injuries(Kovač M et al., 2016)

A radiological survey of hip and knee osteoarthrosis of female physical education teachers was carried out, the findings of the x-ray revealed that the rate of severe as well as moderate knee osteoarthrosis among female PETs is equal to that of females of similar age in the general population whereas the rate of minimal and mild osteoarthrosis was lower comparatively and incidence of hip osteoarthrosis among female PETs was less significantly higher than other females proposing that the risk of the early development of hip osteoarthrosis is not greater in female PETs except to a small group that undergoes overuse and hypermobility of hip.(Eastmond CJ et al., 2009)

Extensively searching through databases including MEDLINE, EMBASE, CISILO and MAK to evaluate the prevalence of job-related musculoskeletal disorders among teachers.33 articles were chosen and studied on the basis of set inclusion criteria to find out the MSK problems and contributing risk factors among teachers that included research on physical education teachers as well. Studies that measured multiple anatomical sites reported, neck disorders: were least found among physical educators (9.3%) as compared to other teachers, shoulder pain in PETs :(18.6% reported in Estonia among physical educators), low back pain in PETs(63% reported in Greece), lower extremities problems in PETs: (2.3% hip pain and 14% knee pain in last one year according to study in Estonia held in 2002). More studies especially longitudinal studies were preferred for a deeper understanding of MSK disorders among teachers and for highlighting the proper agronomical factors for prevention. (Erick PN et al., 2011)

Sports injury occurs during the academic life of physical education teachers for the sake of developing preventive measures for traumatic injuries. On the basis of the findings, the incidence rate of injury was 1.91 and the risk of injury was 0.85. Lower extremities acute injuries seemed to be the highest and a decreased rate of ankle injuries was associated with cool-down exercises.(Goossens L et al., 2014)

A study to determine musculoskeletal pain and injuries and their associated risk factors. Filicinski performed this research on undergraduate physical educators of the University of Szczecin, students reported sports injuries (42.4%women 50.5% men) showing higher prevalence in males than females. The knee, shoulder and ankle were described as the most affected sites of pain commonly caused by sports activities.(Fliciński JA et al., 2007)

Hamstring injuries occurrence along with and risk of hamstring injuries among physical education teacher education students was assessed and trainees were reported with hamstring injuries within one academic year. 81 trainees performed maximum muscular strength tests of hamstrings and quadriceps at the beginning of the academic year and 61 completed single leg hop for distance. 16 hamstring injuries seemed positive in 10 participants and 8 trainees had a positive risk of developing hamstring injuries. (Goossens L et al., 2014)

Conclusion

Physical education teachers of Hyderabad reported with highest percentage occupation related musculoskeletal disorders involving various body regions with the lower back being most frequently affected. The highest incidence of work-related musculoskeletal disorders among physical educators of Hyderabad during the last 12 months was lower back pain (42%), followed by shoulder pain (36%), then wrist or hands (30%), neck (28%), upper back (21%), knee and buttocks(17%,16%) and ankle and elbow(15% and 11%). The majority of the physical educators presented with the experience of trouble in different body parts during the last 7 days with the highest involvement of the lower back (39%), neck (26%), and upper back (19%). Other recently involved sites include shoulder and elbow (6%),14% wrist and hand,13%,19%and 16 % reported buttocks, knees and ankle pain

respectively. The study concludes that lower back pain and shoulder and neck pain are widely prevalent work-related musculoskeletal problems among physical education teachers of Hyderabad leading to an increased number of absenteeism and sick leaves from the workplace. Excessive workload, prolonged duty hours, poor training and lack of postural education and repetitive body movements can be the predisposing factors for the development of occupational health problems affecting musculoskeletal problems among physical educators of Hyderabad.

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