Prevalence of Musculoskeletal Disorders among Primary School Teachers in Nawanshahr Punjab, (India) - A Case Study

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Abstract

Musculoskeletal Disorder have been described as the most troublesome and common causes of severe long term pain and physical disability that affect hundreds of millions of people across the world. From the literature review it is observed that the musculoskeletal disorder is very common among School teachers. Objective: The purpose of this paper is to examine prevalence of musculoskeletal disorder among the Primary school teachers. Methodology: A self-designed questionnaire based on Nordic musculoskeletal disorder was delivered to hundred Primary school teachers in district Nawanshahr, Punjab. Out of which eighty five questionnaires were responded completely and fifteen questionnaires were responded partially which have not been included in the study. The recorded data has been analyzed using Chi-square test with statistical package for the social sciences (SPSS 21). Results: Participants suffering from MSD during the last 12 months reported high problem in the Neck (58.6%), low-back (48.4%), and shoulder (40.7%) and upper back (38.5%) and low pain problem in the knees (20.5%), hand/wrist (19.5%), foot/ankle (15.3%) and other parts of the body. In the present study it was found that most of prevalence of MSD is found in Female teachers as compared to male teachers. It is also observed that age, long working hours, bad work postures, and unhealthy working conditions also contribute to the MSD problems in Primary school teachers. Conclusion: the study showed that a prevalence of high disorders is found in the Neck, low back , shoulder ,upper back and prevalence of low disorder is found in the knees , hand/wrist etc. It is recommended that proper work posture, healthy working conditions and proper working hours must be provided which make the work easier and more relaxed.

Keywords: Musculoskeletal Disorder (MSD), Teachers, Neck pain, low back pain.

1 Introduction:

Musculoskeletal Disorder have been described as the most notorious and common causes of severe long term pain and physical disability that affect hundreds of millions of

people across the world.[1] The disorder occurs when the body part is called on to work harder, stretch further, impact more directly or otherwise function at a greater level than it is prepared for. It includes a wide range of inflammatory and degenerative conditions affecting the muscles, ligaments, tendons, nerves, bones and joints. Immediate effect will be minute, but after a repetitive stress/strain, constant micro trauma causes damage.[2] Disorders of musculoskeletal system are very common, and their incapacitating effects on work ability, especially with respect to the back have significantly increased during the last few decades.

MSD represents one of the most common and important occupational health problem in working population being responsible for a substantial impact on quality of life and incurring a major economic burden in compensation cost and lost wages.[3,4] It is indicated that psychosocial factors, individual factors, workplace physical requirements and workplace organizational factors have been associated with the risk.[3,5-7] Various risk factors like age, gender, length of employment, awkward postures, prolonged postures, static works, and repetitive work were found to be the cause of MSD.[5,8-13] Musculoskeletal disorders (MSDs) affects occupational health, productivity and the careers of the working population. Musculoskeletal diseases, including pain, weakness and paraesthesia, are reported to be associated with wide range of occupations.[14]

MSD has been found to be one of the leading causes for ill health retirement among school teachers in Republic of Ireland.[15] A recent published Scottish study found that the most common causes for teachers ill health retirement were mental disorders (37%) followed by musculoskeletal disorders (18%).[16] MSD represent a common health related reason for discontinuing work and for seeking health care. In relative to other occupational groups, school teachers in general have been demonstrated to report a higher prevalence of MSD with prevalence rates of between 40% and 95%.[2,8,9,17-20] During the course of their work, teachers may be subjected to condition that causes physical health problems. Work of a teacher does not only involve teaching students, but also preparing lessons, assessing students work and being involved in extracurricular activities like sports. These may cause teachers to suffer adverse mental and physical health issues due to the variety of job functions.[8]

Work task of school teachers often involve significant use of a "head down" posture[5,21] such as frequent reading, marking of assignments, working with a forward head posture on a computer,[22] repetitive twisting postures during lectures and repetitively overhead writing on a blackboard.[3,5,23] Nursery school teachers were found to have elevated prevalence's of neck, shoulder, arm and low back pain disorders and lower extremity musculoskeletal disorders due to activities which require sustained periods of kneeling, stooping and bending.[23,24] Another recent study conducted in Hongkong showed that 99.5% of the respondents suffered at least one type of the 39 single health problems including neck pain, shoulder pain and lower back pain, on the total Subjective health scale during the preceding 30 days.[8] Gender differences in the prevalence of musculoskeletal complaints also have been reported. Female teachers being at higher risk than males, due to difference in the exposures, females more prone to express pain and symptoms, because of lower threshold for pain and symptoms or because they are more willing to express than men.[25]

School teachers, representing an occupational group are at a higher prevalence of developing MSD's due to working stress. Despite this, the impact of MSD specifically within the teaching profession has not been given sufficient attention. Furthermore, comparatively, little

research has investigated the prevalence and risk factors of MSD in teaching profession[12]. Very few studies are available in this regard and there are no studies evident in India.

Hence the purpose of this study is to find out the prevalence of MSD and associated risk factors among Primary school teachers, in Nawanshashr.

2. Material & Method

This study was carried out during 2014 in 20 Schools of one Block of Nawanshahr district in Punjab, randomly selected among the major Schools in the Nawanshahr, Punjab (India). An observational cross-sectional study design was adopted. All school employees who use computer and doing other works (n = 100) were selected for the study. A self-administered questionnaire, together with an invitation letter and information about the study, was distributed to each employee of the schools by hand. Reliability of the questionnaire was studied through repeating the same questionnaire on the 15 employees included in the pilot study. Approval to carry out the study was obtained from the headquarters of schools. The Cronbach reliability coefficient was more than 0.78 for the questionnaire. The researcher made an appointment a few days later to come back to collect the completed questionnaire. The selection criteria chosen as:

2.1 Inclusion Criteria: Age: above 25 years; all males and females; Educational qualification: all level; working experience more than one year, Employees present during data collection and Willingness towards participation.

2.2 Exclusion Criteria: Any type of postural deformities; Any history of recent injury/trauma or accident ;Spinal surgery or any other surgery in any part of the body ; Any neurologic disorders ; Limb length discrepancies or any Lower limb deformities and Retired ; Pregnant and severely fallen ill recently. A specially designed self-administered questionnaire included the following: Individual factors, Work-related factors and psychosocial factors.

Chi-square test and F-test were used for qualitative data and separated multivariable logistic regression models were used to assess the associations between the prevalence in each body region and statistically significant factors. Backward selection procedures were used in the statistical modeling. The odds ratios (ORs) associated with particular factors were adjusted for the effect of all other factors that were in the model. Adjusted ORs and 95% CI for the final models were presented in the results section. All statistical analyses were performed using the SPSS statistical software, version 21.0.

3. Results:

A total of 100 primary school teacher responded to the questionnaire, for a response rate of 85%. 15 employees were excluded because they did not meet the inclusion criteria. Therefore, 85 were eligible for participation in the study. Participants suffering from MSD during the last 12 months reported high problem in the Neck (58.6%), low-back (48.4%), and shoulder (40.7%) and upper back (38.5%) and low pain problem in the knees (20.5%), hand/wrist (19.5%), foot/ankle (15.3%) and other parts of the body. In the present study it was found that most of prevalence of MSD is found in Female teachers as compared to male teachers. It

is also observed that age, smoking, drinking habits, long working hours, bad work postures, and unhealthy working conditions also contribute to the MSD problems in Primary school teachers. Table 1 presents the demographic characteristics of the teachers participating in the study, Table 2 Prevalence of Musculoskeletal disorders (MSD) by affected body part among teachers in Nawanshahr ,Punjab(India), Table 3 Relationship between characteristics of Primary school teachers and Table 4 Significant risk predictors of Musculoskeletal disorder (MSD) among primary school teachers using multiple Logistic regression.

4. Conclusion:

The study showed that a prevalence of high disorders is found in the Neck, low back , shoulder ,upper back and prevalence of low disorder is found in the knees , hand/wrist etc. It is recommended that proper work posture, healthy working conditions and proper working hours must be provided which make the work easier and more relaxed.

Table 3.1 Air emissions (Gg) when TPP was not working for one week in 1-3 Km range

S.No.	Values of Emissions	Mean value of emissions (Gg)
1	2095, 2315, 2345	2250
2	1980, 2145, 2240	2121
3	2265, 2380, 2490	2378
4	2150, 2210, 2495	2285
5	2125, 2208, 2380	2237
6	1921, 2030, 2245	2065
7	1970, 2025, 2140	2045

Table 3.2 Air Emissions (Gg) when TPP was working in 1-3 and 6-9 Km range

S.No	1-3 Km range		6-9 Km	
	Values	Mean Values	Values	Mean Values
1	4665, 4695, 4890	4750	5487, 5525, 5615	5542
2	4590, 4695, 4785	4690	4890, 5015, 5120	5008
3	4310, 4570, 4686	4522	4811, 4870, 5210	4963
4	4295, 4397, 4480	4390	4805, 4922, 5135	4954
5	4245, 4372, 4412	4343	4812, 4895, 5025	4910
6	4170, 4210, 4307	4229	4811, 4897, 5013	4907
7	3945, 4003, 4115	4021	4765, 4790, 4810	4788

Table 3 Regression Equations for predicting Hand grip strength from Anthropometric Measures

Model	F	Sig.
$\hat{Y}_{RH} = -61.24 + 4.72\ X_2 + 2.37\ X_3$	6.55	0.004
$\hat{Y}_{LH} = -9.87 + 0.72\ X_2 + 3.62\ X_3$	4.08	0.026

where X_2: HL (cm), X_3: PL (cm)

Table 4 Background information about the validation group participants

Parameters	VG
Age (years)	37.3 ± 6.95
Stature (cm)	165.2 ± 7.21
Body Weight (kg)	60.7 ± 12.49
BMI ($kg.m^{-2}$)	22.3 ± 4.24
Hand Length (cm)	17.9 ± 0.71
Palm Length (cm)	10.0 ± 0.53

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