

Musculoskeletal Pain and its Associated risk factors in school teachers of Lahore

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ABSTRACT

Aim: To find out the occurrence of musculoskeletal pain and its associated risk factors in schoolteachers of Lahore.

Study Design: Cross-sectional study.

Place and duration of Study: The study was done in different public and private schools of Lahore from December 2020 to May 2021.

Methodology: In this observational study, 921 schoolteachers, fulfilling the eligibility criteria, from different school participated. The data was collected by using a self-administered Performa.

Results: In the survey 921 participants participated among which 686(74.8%) were males and 232(25.2%) were females. Out of 921 participants, a high percentage 652(70.8%) had Musculoskeletal pain while 269(29.2%) reported no pain in any region. The frequency of pain in neck, upper extremity, low back and lower extremity in I was 157(17%), 258(28%), 153(16.6%) and 84(9.1%) in multiple sites of body. The frequency of participants with mild, moderate, severe and worst pain was 198(21.5%), 324(35.3%), 110(11.9%) and 20(2.2%) respectively.

Conclusion: This study concluded that the Musculoskeletal pain affect schoolteachers and it is highly associated with history of trauma, the hours of standing and the back support while sitting while less association of overhead activities such as writing on board.

Keywords: Musculoskeletal pain, schoolteachers, electronic devices, risk factors, MSK pain

INTRODUCTION

The most common symptom about which the people complain is Pain which main reason is musculoskeletal disorders¹. According to previous studies, the more affected sites of musculoskeletal pain (MSP) were shoulder and neck, low back and the upper limbs. The cause of musculoskeletal pain is mainly multi-factorial, including psychological, social and physical factors. The risk factors that aggravates the MSP includes gender, age, prolonged sitting, daily lifting of loads, physically strenuous work, improper posture, anxiety level, and poor mental status^{2,3}. The pain due to musculoskeletal disorders results in disturbance in body's joints, ligaments, muscles, nerves and tendons, which develop slowly with time due to the environment or workload⁴. In comparison with other occupations, the teachers report a high prevalence of musculoskeletal pain⁴. The prolong working duration consist of different activities such as checking the workbooks/assignments, head down posture, writing on board and work on computers results in mental and physical tiredness in different countries of Asia⁵⁻⁷.

MSP is the main reason of affected performance, early retirement and absenteeism in teachers due to the stress^{6,7}. The workload of teachers is not just limited to teaching students, it also includes assessing student's work, participating in different school activities, and work

preparing lessons. These stressful factors leads to adverse mental and physical health issues^{2,8}.

In 2017, a study stated the frequency of musculoskeletal pain among secondary school female teachers in Aljouf region, Saudi Arabia was 68.50%. Significant predictors of disabling musculoskeletal pain were age more than 40 years, not practicing exercise, more than ten years of teaching, and non-comfortableness of school furniture⁵. A study done in 2009, showed a high prevalence of MSP in lower extremity (41.1%), upper extremity (23.7%) and back (41.1%) associated with high level of physical exertion, working experience over 5 years and unfavorable environment of classroom⁹. Another study by Korkmaz reported that 463(51.4%) teachers frequency of MSP. Gender, emotional status, improper posture and age are significant risk factors in terms of developing MSP¹⁰.

The literature found on musculoskeletal pain and its associated risk factors is limited. Further longitudinal studies need to be done to find the main causes of MSP in teaching occupation, as it is very noble profession with huge responsibilities of bright future of students. The aim of this study was to find out the musculoskeletal pain and its associated risk factors in school teachers of Lahore.

MATERIALS AND METHODS

The study design used in this study was cross-sectional. Total sample participated in this study was 921 calculated by using online epitool (by using estimated true

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proportion=0.67¹¹, desired precision=0.04 and confidence interval=0.99). After permission from Ethical Review Board, the data was collected from different schools of Lahore including both government and private schools by a self-administered questionnaire. Participants included in this study were both male and female teachers, who was within the age of 20-60 years and with working experience of more than one year. While participants excluded in this study were those having any fracture or dislocation, with any neurological disorders, any metabolic disorder, any recent surgery/operation, arthritis, pregnant women, any history of cardiac diseases. Permission was taken from the heads of the schools and participants were informed about the importance of this study. For data entry and data analysis, SPSS version 21 was used. For qualitative data, percentage and frequency was calculated while for quantitative data, mean \pm S.D were calculated.

RESULTS

In the survey 921 participants participated among which 686 (74.8%) were males and 232(25.2%) were females. The mean \pm SD of participants was 30.96 \pm 7.61years. The 716(77.7%) participants are teaching in academic, 162(17.6%) physical education and 43(4.7%) in music domain. The teaching experience of 534(58%), 216(23.5%), 93(10.1%) and 78(8.5%) participants had 1-5 years, 6-10 years, 11-15 years and >15 years respectively. Out of 921 participants, a high percentage 652(70.8%) had Musculoskeletal pain while 269(29.2%) reported no pain in any region. The frequency of pain in neck, upper extremity, low back and lower extremity was 157(17%), 258(28%), 153(16.6%) and 84(9.1%) respectively. The pain duration in 144(15.6%) participants was from 3 months, 197(21.4%) had pain from 6 months, 178(19.3%) from a year and 133(14.4%) for more than a year. The frequency of participants with mild, moderate, severe and worst pain was 198(21.5%), 324(35.3%), 110(11.9%) and 20(2.2%) respectively (Table 1).

There is no association of gender ($p=0.931$) and age ($p=0.238$) with pain while the teaching experience ($p=0.001$) is significant factor of MSK pain. The risk factors such as any history of trauma ($p=0.025$), duration of using electronic devices ($p=0.015$), the hours of standing ($p=0.001$) and the back support while sitting ($p=0.006$) were found highly significant for the musculoskeletal pain in participants while the overhead activities such as writing on board ($p=0.04$) contribute less. The number of classes

taught a day ($p=0.249$), number in students in a class ($p=0.237$), hours of driving ($p=0.056$), the break hour between classes ($p=0.150$), and writing with head down ($p=0.470$) were not found significant factors for musculoskeletal pain. The presence of numbness/tingling in legs was significant in participants having pain ($p=0.041$). While the presence of pain was not found significant in affecting the teaching methodology or the activities of daily living ($p=0.066$) (Table 2).

Table 1: General characteristics of participants and region, duration and intensity of pain

Parameters	Frequency%
Gender	
Male	689 (74.8%)
Female	232 (25.2%)
Age (mean\pmSD)	30.96 \pm 7.61years
Minimum	20 years
Maximum	59 years
Marital status	
Single	437 (47.4%)
Married	484 (52.6%)
Subjects you teach	
Academic	716 (77.7%)
Physical Education	162 (17.6%)
Music	43 (4.7%)
Teaching experience	
1-5years	534 (58%)
6-10years	216 (23.5%)
11-15years	93 (10.1%)
>15years	78 (8.5%)
Do you have pain?	
Yes	652 (70.8%)
No	269 (29.2%)
Pain site	
Neck	157 (17%)
Upper extremity	258 (28%)
Low back	153 (16.6%)
Lower extremity	84 (9.1%)
Pain duration	
From 3 months	144 (15.6%)
From 6 months	197 (21.4%)
From a year	178 (19.3%)
More than a year	133 (14.4%)
Pain Intensity (VAS)	
Mild pain (1-3)	198 (21.5%)
Moderate pain (4-7)	324 (35.3%)
Severe pain (8-9)	110 (11.9%)
Worst pain (10)	20 (2.2%)

Table 2: Cross-tabulation of pain and its risk factors

		Do you have pain?		Total	p-value
		Yes	No		
Did you suffer from any trauma?	Yes	382	138	520	0.025
	No	270	131	401	
Do you feel numbness or tingling in your legs?	Yes	377	138	515	0.041
	No	275	131	406	
Duration of using electronic devices Tab mobiles computer set	1-2hours	228	81	309	0.015
	3-5hours	249	90	339	
	more than 5 hours	175	98	273	
How many hours a day do you work while standing?	1-2hours	113	60	173	0.001
	3-5hours	303	84	387	
	more than 5hours	236	125	361	
How many classes do you teach a day?	2-3	115	45	160	0.249

	4-5	222	78	300	
	5-6	206	88	294	
	>6	109	58	167	
How many students a class are you teaching?	30-40	328	121	449	0.237
	41-50	153	76	229	
	>51	171	72	243	
Do you support your back while sitting properly?	Yes	362	124	486	0.006
	No	290	145	435	
Do you think that you cannot teach properly because of pain?	Yes	374	156	530	0.46
	No	278	113	391	
Does pain disturb your sleep?	Yes	397	152	549	0.123
	No	255	117	372	
Hours of driving	Don't drive	385	144	529	0.056
	2-3hours	147	56	203	
	4-5hours	71	35	106	
	>5hours	49	34	83	
Is the pain interfering daily life activities?	Yes	431	163	594	0.066
	No	221	106	327	
Do you think that your pain is due to your profession teaching?	Yes	365	137	502	0.092
	No	287	132	419	
Do you have breaks during your duty except lunch breaks?	Yes	375	144	519	0.150
	No	277	125	402	
Would working in overhead writing posture (e.g. writing on board) induce pain?	Yes	434	162	596	0.040
	No	218	107	325	
Would working with head down posture (e.g. checking copies/test) induce pain?	Yes	471	193	664	0.470
	No	181	76	257	

DISCUSSION

This study revealed a high frequency of musculoskeletal pain in schoolteachers. The most common pain in teachers was the upper extremity pain followed by neck, low back and lower extremity pain. The risk factors highly associated with MSK pain were history of trauma, teaching experience, the hours of standing and the back support while sitting while less association of overhead activities such as writing on board. There is no association of MSK pain found with age, gender, number of classes taught a day, number in students in a class, hours of driving, the break hour between classes, and writing with head down.

One more study done by Abdel-salam¹² finds the prevalence of musculoskeletal pain among secondary school female teachers in Aljouf region, Saudi Arabia was 68.50%. The main sites of musculoskeletal pain were low back, knee, shoulder, neck, elbow, and wrist. Significant predictors of disabling musculoskeletal pain were age more than 40 years, not practicing exercise, more than ten years of teaching, and non-comfortableness of school furniture. In 2013, the study done by Darwish⁴ showed a high prevalence of MSK pain in secondary school teachers with associated risk factors such as the type of school, age, weight, number of children, and number of teaching years. The most common site of pain was low back, followed by shoulder, neck, lower extremity, wrist and elbow. The results of these studies were similar to the current study, which show a high frequency of MSK pain in teachers with pain sites more prone are upper extremity, neck, low back pain and lower extremity associated with teaching experience. Contrary to the result of Darwish and Abdel-salam studies, there was no association found with age, and number of children in a class while the risk factors such as type of school, school furniture, lifestyle and the weight of teachers not evaluated.

In 2017, study by Zahid¹³ find the frequency of low back pain in school teachers which was affected by the work load, sitting support and the type of job. Another study by Yue¹⁴ in 2012 showed a high frequency of neck/shoulder and low back pain in school teachers and it was found significantly associated with prolong static posture and uncomfortable back support. The results these studies were in favors of the current study.

A study done by Bandpei¹⁵ in 2014 found high prevalence of low back pain in school teachers which was highly associated with age, body mass index, length of employment, job satisfaction, and work-related activities while in the present study, the length of employment and work-related activities affect pain. Opposition to the Bandpei's study, this study found no association of age with pain. In another study done by korkmaz¹⁶ in 2011, found that teachers are at risk of MSK pain. Gender, age, emotional status, and improper posture are significant risk factors in terms of developing MSP. Meanwhile, female teachers suffers more with pain and expressed that the pain severity increases with the overhead reaching and more activity limitations. A systematic review done in 2011 by Erick¹⁷ suggests that school teachers are at a high risk of MSD. Factors such as gender, age, length of employment and awkward posture have been associated with higher MSD prevalence rates. The present study did not evaluated the factors such as emotional status and improper posture. Favoring the results of Korkmaz and Erick studies, the current study found the association of pain with overhead activities and teaching experience while opposing the results the present study showed no significant association of age and gender with pain.

Karaemer¹⁸, in 2020, evaluated musculoskeletal pain and ergonomic risk factors in the workplace of teachers at the São Bento do Sul Campus of the Institution Federal Catarinense. Results shows the main ergonomic risks to which teachers exposed were prolonged sitting and

standing, sharp corners on desks, use of laptop touchpads and inadequate monitor height. The present study also shows that the use of electronic devices increases MSK pain.

Further research is needed to more thoroughly evaluate the issue of musculoskeletal pain among teachers, with a great focus on the different associated factors such as the type of school, the emotional status, weight/BMI, job satisfaction, the facilities provided by the school, postural ergonomics, lifestyle etc. should be evaluated. This would represent a major step forward in the prevention of MSD among teachers, especially if easy to implement control measures could be recommended.

CONCLUSION

This study concluded that the musculoskeletal pain affect schoolteachers and it is highly associated with history of trauma, the hours of standing and the back support while sitting while less association of overhead activities such as writing on board.

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