Original Article

Prevalence of musculoskeletal disorders, associated risk factors and coping strategies among secondary school teachers in Fiji

Ranisha Kiran Chand, Mudassar Ali Roomi, Shofeen Begum, Ansa Mudassar

Departments of Physiology, Fiji National University, Fiji and Amna Inayat Medical College, Sheikhupura, Pakistan

Objective: We aimed to determine prevalence of musculoskeletal pain (MSP), associated risk factors, and pain-coping strategies among secondary school teachers (SSTs) in Suva, Fiji.

Methodology: We recruited 262 SSTs of both genders, with at least one year teaching experience, from 14 secondary schools by convenience sampling. Data related to presence of MSP, pain increasing and decreasing factors were collected.

Results: MSP prevalence at any site during last 12 months was 88.9%. Neck pain (48.5%) was the most common, followed by shoulder pain (46.6%) and then lower-back pain (45.4%). Female gender (p=0.000) and a higher children number (p=0.005) were associated with MSP. Prologned standing (p=0.000) and sitting (p=0.025), bending (p=0.045) and carrying weight (p=0.005) were significant pain increasing factors. Taking rest and lying down (p=0.000), heat/cold therapy (p=0.049), massage (p=0.001) and taking sick-leaves (p=0.001) were significant pain decreasing factors.

Conclusion: We found a high MSP prevalence especially in neck, shoulder and lower-back. MSP risk was higher in females and in those with higher children number. Prologned standing and sitting, bending and carrying weight were pain increasing factors while taking rest, thermal therapy, massage and taking sick-leaves were pain decreasing factors. There is acute need for raising awareness of risk factors, coping strategies and consequences of musculoskeletal disorders among SSTs in Fiji. (Rawal Med J 202;45:377-381).

Keywords: Musculoskeletal pain, work-related musculoskeletal disorders, neck pain, shoulder pain, back pain, occupational health.

INTRODUCTION

Musculoskeletal disorders (MSDs) are a common job-related health problem in workforce. School teachers represent a professional group with high MSDs prevalence and have been shown to contribute to absenteeism and loss of productivity with significant economic impact.[1,2] Work-related musculoskeletal disorders (WMSDs) include inflammatory and degenerative conditions affecting musculoskeletal system, which can occur from trauma or overuse injuries.[2] The US Department of Labor has demarcated WMSDs as disorders/injuries of muscles, nerves, tendons, joints, cartilage, and spinal discs with exposure to risk factors in workplace.[3] With rising development, inactivity, fatigue and MSDs have increased in school teachers.[4] Work tasks of SSTs often involves use of 'head down' posture e.g. reading, assignment marking, and writing on blackboard/whiteboard.[5] WMSDs have become occupational-health issue and are expected to upsurge because of changing work nature and aging of teachers.[6]

Overweight/obesity and physical inactivity are common among adult Fijian population[7] and are known to increase MSD risk.[8] Work-related risk factors of MSDs are also problematic e.g. bending or twisting back in an awkward way, continuing to work when injured/hurt, and working in same position for prolonged periods. There seems a dearth of data on MSDs among Fijian SSTs. Therefore, we aimed (a) to determine MSDs prevalence and associated risk factors among SSTs in Suva, Fiji during last 12 months, and (b) to investigate major pain increasing and decreasing factors among SSTs affected with MSDs.

METHODOLOGY

This cross-sectional study was conducted during June-July 2018 among teachers from 14 secondary

schools in Suva, Fiji. Inclusion criteria were: SSTs who were teaching for at-least last one year. Exclusion criteria were: SSTs having pregnancy, thyroid dysfunction, diabetes, stroke, walking aid, back injury or congenital spine problems. Participants were recruited by convenience sampling. Ethical approvals were obtained from College Health Research and Ethics Committee, Ministry of Education, and Ministry of Health, Fiji. School Principals, teachers were informed about the study nature. Informed consent was obtained from all SSTs.

Independent variables were age, gender, ethnicity, teaching experience, working hours/day, exercise, sleeping hours, etc. Dependent variables were pain duration, and painful regions of body during last 12 months. Data were collected using self-administered questionnaire. First, second, third and fourth sections of questionnaire were related to biodata and sociodemographic features, independent variables, musculoskeletal symptoms and pain increasing factors, and pain-coping strategies, respectively. Height and weight were measured and body mass index (BMI) was calculated. Questionnaire was designed to suit this study by using similar studies.[9-12] It was also checked for its content and face validity by two experts.

Statistical Analysis: Data were entered in SPSS version 20. Associations between independent and dependent variables were checked using Chi-square. A $p \leq 0.05$ was considered significant.

RESULTS

Total participants were 255 with 80% response rate. Total females were 164(64.3%) and males were 91(35.7%). According to age groups, 44% (n=110) were <35 years old and 56% (n=138) of the participants were ≥35 years. Overall mean age was 36±7.4 years. Mean age of male participants was 36.7±7.57 (22-53) years while that of females was 35.3±6.98 (22-54) years. Moreover, 50% participants were Indian-Fijians and 41.3% were i'Taukei. Most of the participants (72%) were married. Two-thirds of participants had 1-2 children and 30.7% had ≥3 children (Table 1).

Table 1. Characteristics of the study participants.

Variable	Categories	n(%)
Age (years)	<35	110(44.3%)
	≥35	138(55.7%)
Ethnicity	i'Taukei	105(41.3%)
	Indian-Fijians	127(50%)
	Others	22(8.7%)
Marital status	Single	62(24.5%)
	Married	182(71.9%)
	Divorced/ widowed/ separated	9(3.6%)
No. of children	No child	6(3.6%)
	1-2 Children	109(65.7%)
	≥3 children	51(30.7%)
Exercise frequency/week	Not at all	39(15.4%)
	1-2	135(53.1%)
	3-4	51(20.1%)
	≥5	29(11.4%)
BMI groups (Kg/m^2)	<25	80(30.5%)
	25-30	69(26.3%)–Overweight
	>30	107(40.8%)–Obese
Work hours /day	1-5	11(4.3%)
	6-10	246(95.7%)
Sleep hours/day	4-5	53(20.9%)
	6-8	198(78.3%)
	≥9	2(0.8%)
Student number per class	≤30	109(43.5%)
	>30	141(56.4%)
Teachers' perception of their work station	Poor	15(5.8%)
	Satisfactory	98(37.9%)
	Good	114(44.1%)
	Excellent	31(12.1%)
Teachers' perception of class room design	Poor	21(8.4%)
	Satisfactory	105(41.8%)
	Good	103(41%)
	Excellent	22(8.8%)

Table 2. Prevalence of MSP in various body regions.

Variable	Participants affected n (%)
Pain for <3 months	165(65.2%)
Pain for 3-6 months	42(16.6%)
Pain for >6 months	18(7.1%)
Neck pain	127(48.5%)
Shoulder pain	122(46.6%)
Upper-back pain	67(25.6%)
Lower-back pain	119(45.4%)
Elbow pain	12(4.6%)
Wrist/hand pain	32(12.2%)
Hip pain	25(9.5%)
Leg pain	61(23.3%)
Knee pain	57(21.8%)
Ankle pain	40(15.3%)
Total regions affected with MSP	
1	56(22.1%)
2-3	125(49.4%)
≥4	61(24.1%)

Table 3. Association between characteristics of the participants and presence of MSP.

Variable	Categories	Presence of MSP n (%)	Chi-square X2	*p*-value
Age (years)	<35	96(88.9%)	0.013	0.993
	≥35	119(88.8%)		
Gender	Male	72(80%)	12.35	0.000*
	Female	151(94.4%)		
Ethnicity	i'Taukei	95(92.2%)	4.67	0.097
	Indian-Fijians	110(88.7%)		
	Others	16(76.2%)		
Marital status	Single	54(87.1%)	2.06	0.356
	Married	160(90.9%)		
	Divorced/ widowed/ separated	7(77.8%)		
No of children	No child	3(50%)	12.65	0.005*
	1-2	96(90.6%)		
	≥3	46(95.8%)		
Exercise frequency/week	Not at all	33(86.8%)	0.927	0.819
	1-2	115(88.5%)		
	3-4	47(92.2%)		
	≥5	25(86.2%)		
BMI (Kg/m^2)	<25	67(84.8%)	2.254	0.521
	25-30	60(90.9%)		
	>30	95(90.5%)		
Teaching experience (years)	<10	94(88.7%)	0.620	0.733
	10-20	97(89.8%)		
	>20	28 (84.8%)		
Working hours /day	1-5	8 (80.0%)	0.822	0.365
	6-10	215(89.2%)		
Sleep hours/day	4-5	44(88%)	0.278	0.870
	6-8	173(88.7%)		
	≥9	2(100%)		
Student number per class	≤30	95(88.8%)	0.138	0.934
	>30	122(88.4%)		
Perception of work station	Poor	13(92.9%)	6.424	0.093
	Satisfactory	91(94.8%)		
	Good	95(84.8%)		
	Excellent	25(83.3%)		
Perception of class room desig	Poor	18(85.7%)	2.648	0.449
	Satisfactory	96(92.3%)		
	Good	90(90.0%)		
	Excellent	18(81.8%)		

*Statistically significant

Table 4. Pain increasing and decreasing factors in teachers affected with MSPs.

Variable	N (%) of teachers with MSP	Chi-square X2	*p*-value
Pain increasing factors			
Standing long-time	169(66.8%)	29.53	0.000*
Sitting long-time	70(27.7%)	5.047	0.025*
Carrying weight	75(29.6%)	8.068	0.005*
Bending	64(25.3%)	4.021	0.045*
Lifting	39(15.4%)	0.164	0.686
Overhead reaching	37(14.6%)	0.085	0.770
Others	36(14.2%)	3.081	0.079
Pain decreasing factors (coping strategies)			
Herbal medicines	72(28.5%)	0.135	0.713
Yoga/exercise	55(21.7%)	0.597	0.440
Rest & lying down	166(65.6%)	14.097	0.000*
Pain killers	109(43.1%)	2.659	0.103
Heat/cold therapy	73(28.9%)	3.878	0.049*
Massage	144(56.9%)	10.573	0.001*
Surgery	2(0.8%)	0.251	0.616
Sick-leaves	128(54.5%)	11.184	0.001*

*Statistically significant

MSP's presence in any region of body during last 12 months was reported by 225(88.9%) participants. Prevalence of MSP was found to be 80% (n=72) in males and 94.4% (n=151) in female participants. Neck pain was the most common MSP reported by 127 (48.5%) participants (Table 2). MSPs' prevalence was higher (p=0.000) among females (94.4%) than males (80%). MSP was also associated with a higher children number (*p*=0.005). The prevalence of MSP in <25 Kg/m^2 BMI group was 88.9% in females and 77.4% in males; in 25-30 Kg/m^2 BMI group, the prevalence of MSP was 97.6% in females and 79.2% in males. Moreover, in >30 Kg/m^2 BMI group, the prevalence of MSP 95.7% in females and 82.4% in males (Table 3).

Prolonged standing (n=169, 66.8%), carrying weight (n=75, 29.6%), prolonged sitting (n=70, 27.7%), and bending (n=64, 25.3%) were significant pain increasing factors among participants having MSDs. Taking rest and lying down (n=166, 65.6%), massage (n=144, 56.9%), taking sick-leaves (n=128, 54.5%) due to MSP, and thermal therapy (n=73, 28.9%) were significant

pain decreasing factors or pain-coping strategies among participants having MSDs (Table 4).

DISCUSSION

We found 88.9% overall MSP prevalence at any body site during last 12 months, which is higher than MSP prevalence (79.2%) in a Saudi study[10] and an African study (83.3%).[13] So, higher MSP prevalence is a significant cause of concern for Fijian SSTs and it may be due to overweight (26.3%) and obesity (40.8%) in Fijian SSTs. In other studies, obesity was associated with increased MSP risk.[10,14]

In our study, most commonly affected site with MSP was neck (48.5%). Similar prevalence of neck pain were reported in Indian[9] (53.5%), Botswanian[15] (50.8%), and Chinese studies[16] (48.7%). Lower prevalence (42.1%) of neck pain were observed in a spanish study.[13] However, a higher prevalence of neck pain was found in Iranian high school teachers.[17] The reasons for neck pain may be prolonged neck bending in forward or backward position as during assignments marking and writing on white/black boards.[18,19]

Second most commonly affected region in our study was shoulder with 46.6% prevalence. Similar prevalence (45.4%) of shoulder pain was in a Saudi study[10] and a higher prevalence (52.5%) in an African study,[15] and a lower prevalence (28.7%) in a Turkish study[12] were reported. In our study, third most commonly affected region was lower-back with 45.4% prevalence. A similar prevalence (43.8%) of lower-back pain in a Turkish study,[12] a higher prevalence (63.8%) in a Saudi study[10] and a lower prevalence (33.8%) were observed in an Indian sudy.[9] In our study, MSP prevalence in lower extremity was 9.5% in hip, 22% in knee and 15.3% in ankle. In another study,[12] it was 8.4% in hip, 32% in knee, and 21.8% in ankle. Knee pain prevalence was 25.35% in an Indian study.[9]

Like other studies, we found higher MSP prevalence among female teachers.[12,15] This might be due to females' lower pain threshold.[18] Having a higher children number significantly increased MSP prevalence in our study, just like other studies.[10,15] Constant need of lifting and carrying small kids may increase MSP risk. Increased stress, more time required to pamper the children, disturbed sleep, and higher workload to raise family income may be other factors that explain increased MSP risk with increasing number of children.[16]

Prolonged standing and sitting, carrying weight, and bending were significant pain increasing factors in our study. This was also associated with MSDs in other studies.[11,20] Prolonged standing decreases spine mobility and increases strain on lumber spine.[21] Adoption of inappropriate postures leading to development of MSP may be attributed to lack of proper furniture.[11] Pain aggravating factors mentioned in other studies are prolonged forward bending in head-down position e.g. assignment marking,[22] repetitive arm and hand movements,[9] lack of job satisfaction, limited reward, large class-size, and lack of educational resources.[11]

We found taking rest and lying down (66%), massage (57%), taking sick-leaves (54%) due to MSP, and thermal therapy (29%) were significant pain decreasing factors. Likewise, taking rest and lying down was found as pain decreasing factor in 65% of participants in another study.[12] Females are more likely to use analgesics and take sick-leaves due to MSP. Females may be worried about their pain and attend to it sooner than males to decrease impact on household activities. However, males were more likely to use thermal therapy.[23] MSP may decrease efficiency of employees and increase risk of absenteeism and presenteeism. Taking leaves sometimes may be difficult for employees as there may be risk of losing job.

Limitations of study include cross-sectional nature which may limit generalizability. Any significant association found just tells that two factors are related without establishing cause and effect relationship. We collected data from government schools only**.** There is also potential for recall bias due to self-reporting of MSP.

CONCLUSION

We found high MSP prevalence especially in neck, shoulder and lower-back. MSDs' risk was higher in females and in those with higher number of children. Prolonged standing and sitting, bending and carrying weight were significant pain increasing factors. Taking rest, thermal therapy, massage and taking sick-leaves were significant

pain-coping strategies.

High MSDs' prevalence in Fijian SSTs' demands a campaign for raising awareness of risk factors, coping strategies and consequences of MSDs. Teachers may be advised to exercise regularly, including flexibility exercises. Weight control may be an effective strategy to improve quality of life.

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Author contributions:
Conception and design: Mudassar Ali Roomi, Ranisha Kiran Chand, Shofeen Begum
Collection and assembly of data: Ranisha Kiran Chand, Ansa Mudassar, Shofeen Begum
Analysis and interpretation of the data: Mudassar Ali Roomi, Ranisha Kiran Chand, Ansa Mudassar
Drafting of the article: Mudassar Ali Roomi, Ansa Mudassar
Critical revision of the article for important intellectual content: Mudassar Ali Roomi,
Statistical expertise: Mudassar Ali Roomi
Final approval and guarantor of the article: Mudassar Ali Roomi
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Corresponding author email: Mudassar Ali Roomi, M.Phil: mudassarroomi@hotmail.com
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