

Prevalence of work related musculoskeletal disorders among construction workers in Hayatabad Peshawar KP, Pakistan

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ABSTRACT

Introduction: Construction is one the blue-collar jobs where individuals are prone to sustain musculoskeletal injuries. As a result, construction workers are forced in abandoning their work prematurely causing a significant burden on the community. Little is known about the frequency of these injuries in construction workers involved in construction industry of Hayatabad and therefore, this survey was designed.

Material & Method: A cross sectional study was conducted at seven different construction sites in Hayatabad Peshawar. To collect data, questionnaire was completed from 300 construction workers. Questionnaire consists of two sections involving demographic characteristics and modified Nordic questionnaire for assessing musculoskeletal injuries. SPSS version 20 was used for data analysis.

Results: Out of these 300 workers, 244 (81.3%) had symptoms in neck, shoulders, elbow, wrist/hand, upper back, lower back, hip/thigh/buttocks, knee, or ankle/feet. The majority of workers had symptoms in low back (32.83%) followed by neck (17.5%) and knee (16.19%).

Conclusion: Majority of the construction workers working at Hayatabad had musculoskeletal injuries in their back and knee joints. Pain, aching and numbness were the chief complaint among these workers.

Keywords: musculoskeletal disorders, prevalence, work-related, construction workers.

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INTRODUCTION

Construction is a blue collar job, in which individuals are exposed to sustain injury to their musculoskeletal system (1). Many construction workers are forced in abandoning their work prematurely as a result of ill health or musculoskeletal disorders (2). Musculoskeletal disorders (MSDs) is a common problem among workers working in construction industry (3, 4). Even though there are numerous papers published on MSDs of different body parts in various groups of workers, very few surveys are performed on a large scale for MSDs of body parts other than the back which have been reported (3). Work Related Musculoskeletal Disorders have increased considerably in recent times throughout the world which not only affects health of an individual leading to disabilities but have also significant economic consequences in the form of sick leaves and medical expenses on the affected individual (5, 6). In terms of safety issues, construction is one of the most hazardous industry (7, 8).

WMSDs comprise a diverse group of disease phenomena which include numerous clearly defined clinical entities, including disorders of the muscles, tendons/sheaths, nerve entrapment disorders, joint disorders, and vascular disorders. The most widely recognized WMSD Hazards are risky and dangerous physical task characteristics included movement, force exertion, joint positions and postures, body part compression, and exposure of body to whole or partly body vibrations (9). Various studies have revealed that MSDs are versatile and may be due to prolonged unchanged posture, doing same task repeatedly, defective body positions, wrong techniques of work, different physical conditioning, genet-

ic causes, age and weight (10, 11). The prevalence of WMSDs have been reported to be 57% among amongst British construction workers (12). In America, about eighteen million workers experience WMSDs symptoms every year (13). Prevalence of WMSDs was 50% during a 12- month study period in a sample of workers from medium sized companies in Shenzhen, China (14). A study conducted in the 'City University of Hong Kong' reported that about 90% of the workers have WMSDs symptoms after they had engaged in construction activities (13). A big proportion (77%) of construction workers reported Symptoms of WMSDs in a study carried out at India (15). The prevalence of WMSDs in workers working in Saudi Arabia was (48.5%) in 2015 (16).

It obvious from the literature that WMSDs in frequently occurring problem, however, there is scarcity of data in Pakistan especially from Khyber Pakhtunkhwa. This survey was designed to find out prevalence and associated factors of the WMSDs in construction workers in Hayatabad, Peshawar.

MATERIALS & METHODS

After the approval of the research proposal by the institutional review board, the required data was collected from the workers who fulfilled the inclusion criteria. Before data collection, permission was taken from the respective head of the projects at Hayatabad Peshawar. Consent was taken from the subjects who were willing to participate in the study. The study was limited to male population who were involved in manual construction works. All construction workers within the age group 18-65 years were included in

this survey. Workers were included if they were working at least 40 hours per week from the last six months.

Construction workers with any systemic diseases that were thought to influence musculoskeletal system were excluded from this survey. For data collection a valid and reliable questionnaire 'Nordic Questionnaire' was used. This questionnaire included different parameters related to musculoskeletal disorders. An information sheet and consent form was given to 300 construction workers and then Nordic questionnaire was filled from these workers working at seven different sites in Hayatabad-Peshawar, Khyber Pakhtunkhwa from October to December 2016. Data was analyzed through SPSS version 20. The collected data was presented with bar graphs and tables.

RESULTS

Out of all 300 construction workers, 102 (34%) were manual laborers, 43 (14.3%) plumbers, 51 (17.0%) masons, 40 (13.3%) carpenters, 30 (10.0%) steel binders and 34 (11.3%) others (for details see figure 1). Majority of these workers 115 (38.3%) were in their age group 27-37 years, followed by age group 18-26 years (104,34.7%), 38-48 years (61 ,20.3%), 49-59 years (16 ,5.3%) and a small proportion 4 (1.3%) was in age group above 60-years old (for details see figure 2). Out of the included population, 244 (81.3%) reported to having any of the musculoskeletal injuries. The maximum number of workers who complain musculoskeletal symptoms were in age group 27-37 years (102, 42%). Most of the participants were having symptoms in the lower back (32.83%) followed by neck (17.5%), knee (16.19%), shoulder (10.50%) and elbow (10.06%) (See figure 3 for more details).

Linking different body parts with work position of the workers showed that in manual laborers low back symptoms (37%) were more common followed by neck (20%), and knees (13%), upper back (8%), wrists/hands (3%), hips/thighs/buttocks (1%) and ankles/feet (1%). In the same way in plumbers, low back symptoms (32%) was more common followed by knees (25%), neck (13%) and elbows (13%). In masons, low back symptoms (33%) were most common followed by shoulder pain (19%). In carpenters, low back symptoms were more common (22%) followed by shoulders (18), neck (17), and knees (15), while in steel binders the most common was low back (41%) followed by knee (19%) (See table 1 for more details). A major proportion (66%) of the workers were having BMI 18.5-24.9, (23.8%) subjects were having BMI 25-29.9, (8.2%) were having BMI <18.5 and (2.0%) workers were having BMI >30. More than half of the population (51%) were having pain, 12% aching, 6.7% numbness, and 5.3% tingling and 3.7% were having stiffness.

The analysis of the questions corresponding to factors that could contribute to WMSDs showed that the major risk factors were lifting the loads (24.34%), working in the same position for long periods (21.56%), working in awkward or cramped positions (19.36%), not enough rest breaks during the day (14.51%), continuing to work despite of injury or pain (12.02%), work scheduling (7.04%) and others (1.17%) (See figure 4 for more details).

Comparing treatment options, it was revealed that 191 workers got medical treatment and 121 (63.3%) of them improved, 2 (1%) worsened and 68 (35.6%) remain unchanged. Only 15 workers got physical therapy and 13 (86.7%) of them improved while 2 (13.3%) remain unchanged.

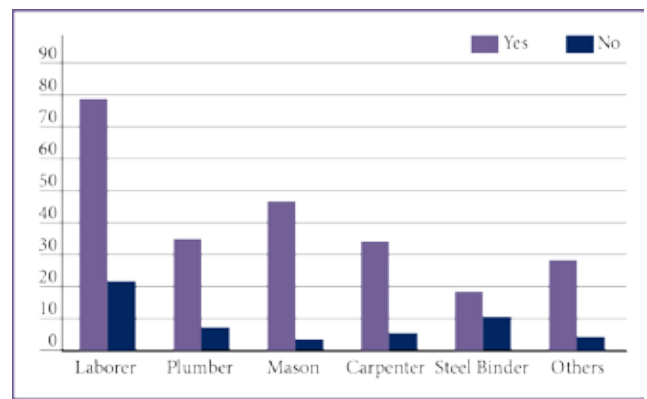


Figure 1: Work position and prevalence of WMSDs

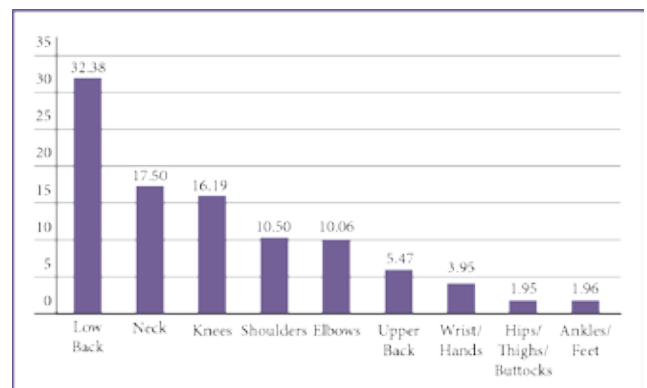


Figure 2: Figure showing areas of symptoms

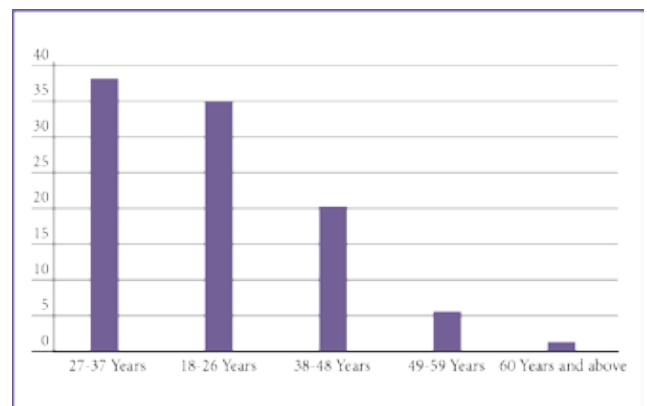


Figure 3: Age distribution of the construction workers

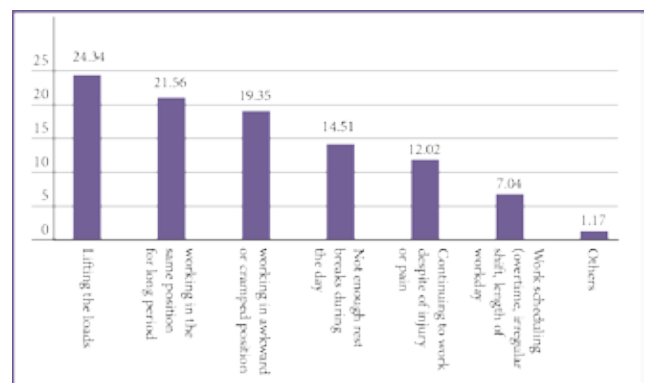


Figure 4: Figure showing factors that could contribute to WMSDs

Table 1: Table showing work positions and areas of symptoms percentage

#	Work Positions	Neck	Shoulder	Upper Back	Elbow	Low back	Wrists	Hip	Knee	Ankle
1	Manual labourer	20	8	8	9	37	3	1	13	1
2	Plumber	13	4	3	13	32	3	4	25	1
3	Mason	13	19	4	8	33	2	1	14	5
4	Carpenter	17	18	3	11	22	9	2	15	3
5	Steel Binder	3	5	3	15	41	5	8	19	3
6	Others	37	5	7	9	24	3	--	15	--

DISCUSSION

The aim of this study was to identify the prevalence of work related musculoskeletal disorders among construction workers. Findings of this study shows 81.3% prevalence of WMSDs among construction worker. Worldwide, musculoskeletal disorders is the single leading cause of work-related ailment in the general population accounting over 33% of all recently reported occupational illnesses while work-related illnesses in construction workers has been reported 77% which is almost similar the prevalence reported in this trial (17). By comparing the prevalence of MSDs in general population and construction workers, previous studies reported that the likelihoods of workers for a consequence of MSD are twice or more, which needs developing means for prevention and control (15). There is scarcity of data on the topic in the province where this survey was conducted and therefore comparison with the local studies is not possible.

The findings of our study show a high prevalence of WMSDs among construction workers working in Hayatabad. These findings are consistent with the previous study conducted in Taiwan where the prevalence of WMSDs in building construction workers was reported as high as 76.2% (3). Similarly, in another web-based survey conducted in Iowa; US reported that 86.8% of construction workers were having WMSDs (18). In our study the finding shows highest prevalence in manual laborers followed by masons, plumbers, carpenters, steel binders, and others. The findings of the present survey are almost alike to the results of a Swedish study which reported highest prevalence of work-related musculoskeletal disorders in manual laborers followed by masons, plumbers, carpenters and others (19). Similarly, in another study from Asian population it was found that manual laborers, followed by carpenters, brick layers, painters, electricians, plumbers and welders are more frequently getting musculoskeletal injuries (15).

The results of our study for WMSDs, area wise in construction workers show high prevalence in low back followed by neck, knee, shoulder, elbow, upper back, wrist/hand, hip/thigh/buttock and ankles/feet. These finding are comparable to a study conducted in New York which shows highest prevalence in lower back trailed by neck, knee, shoulders and elbows (20). Findings of our study show highest prevalence of low back pain in construction workers which is consistent with results of many other studies. A structured interview based German study reported 32% prevalence of low back pain among construction workers (21). Holmstrom et al reported 54% prevalence of low back pain in construction workers (22).

Our study found a link between years of experience and the prevalence of MSDs in our respondent at work site. The worker having greater working experience has high prevalence of musculoskeletal symptoms. A prior study reported a link between MSDs

and years in the construction company. The workers, who work less than five years, have prevalence thirty three percent. The response rate inflates to forty percent when experience is six to ten years. The response rate further rises to eighty four percent when the working years are up-to thirty years (23). However, in our enquiry we classify work experience into five classes one to three years sixty eight percent, four to six years sixty eight percent, seven to nine years eighty one percent, ten to twelve years eighty six percent and greater than twelve years, eighty-nine percent, this shows a significant link of working experience with WMSDs ($p < 0.05$). The results of our research shows significant association of age with the prevalence of WMSDs among construction workers ($p < 0.05$) the percentage of MSDs increase with age from the age group ,18-26 years to 27-37 years and 38-48 years then slightly decrease from 49-59 years to 60 year and above. Our finding is consistent with a Swedish study by Holmstrom et al which shows the percentage of WMSDs by age among construction workers increased with age from the youngest agegroup 18% to a maximum 38% for ages fifty five to fifty nine years followed by slight decrease in percentage ages sixty years and above (19).

In the present study there is also significant association ($p < 0.05$) between BMI and prevalence of WMSDs among construction workers. This significant association of BMI and prevalence of WMSDs is supported by a study conducted in Saudi Arabia which reported that the majority of construction workers who reported MSDs were below or above normal BMI range (16). In our study the common factors that could contribute to WMSDs risks in all work positions was lifting the loads (24.34%), working in the same position for long periods (21.56%), working in awkward or cramped positions (19.36%), not enough rest breaks during the day (14.51%), continuing to work despite of injury or pain (12.02%), work scheduling (7.04%) and others (1.17%). Our finding is closely supported by an Indian study conducted in 2013 which recorded workers exposure to the common risk factors. Major risk factors were working in the same position for long periods, lifting the loads, bending or twisting the back in awkward way, working overtime, not enough rest breaks or pauses during workdays, working in awkward and cramped positions, continuing to work while injured or hurt(24). It has been reported in a systemic review that MSDs were multifactorial closely associated with forceful exertion, awkward body postures, pressure/pinch points, hot/cold temperatures, work in static position and vibrations (25). The results of cross-sectional survey of construction workers conducted in Vilnius, Lithuania have shown that the work-related musculoskeletal complaint is considered the main reason for using high physical force during working and an awkward work posture (23). It seems plausible that WMSDs closely related to the mentioned external environmental factors.

In our study the response rate was 81% which seems quite reason-

able, however, we were not able to get detailed information of non-responders. Moreover, we only focused on male population and was not able to get information from female population. The reason for this was unavailability of female working in construction industry in Hayatabad where females are not actively participating in this industry. Outcomes were not clinical diagnoses in the present study, as all the musculoskeletal disorders were self-reported and hence further trial with inclusion objective measures for WMSDs might be included.

CONCLUSION

The prevalence of WMSDs in this cross-sectional survey suggests that individual working in construction industry are prone to developing WMSDs and the more they are getting experience in this industry the more they become prone to these injuries.

REFERENCES

1. Wickman F. Why Do We Call Manual Laborers Blue Collar? USA: Slate Online Magazine; 2012 [Available from: http://www.slate.com/articles/business/explainer/2012/05/blue_collar_white_collar_why_do_we_use_these_terms_.html].
2. Eaves S, Gyi DE, Gibb AG. Building healthy construction workers: Their views on health, wellbeing and better workplace design. *Applied ergonomics*. 2016;54:10-8.
3. Guo H-R, Chang Y-C, Yeh W-Y, Chen C-W, Guo YL. Prevalence of musculoskeletal disorder among workers in Taiwan: a nationwide study. *Journal of occupational health*. 2004;46(1):26-36.
4. Schneider SP. Musculoskeletal injuries in construction: a review of the literature. *Applied occupational and environmental hygiene*. 2001;16(11):1056-64.
5. Evangelos C Alexopoulos SI-C, Charizani, Fliedner TM. Prevalence of musculoskeletal disorders in dentists. *BMC Musculoskeletal Disorders*. 2004;5(16):8.
6. Deros BM, Daruis DD, Khamis NK, Mohamad D, Daud SFM, Amdan SM, et al. Prevalence of Work Related Musculoskeletal Disorders Symptoms among Construction Workers: a Case Study in Malaysia. *Iranian Journal of Public Health*. 2014;43(3):53.
7. Vad MM, Kines P. Construction workers' perception and use of assistive devices in regards to musculoskeletal deterioration: a qualitative study. *Safety Science Monitor*. 2011;15(3):1-11.
8. Building, Organisation CIT. Older workers in the construction industry. 2013.
9. Safety A, Council C. Work-related musculoskeletal disease in Australia. Canberra: Commonwealth of Australia ISBN 0. 2006;642:326770.
10. Zeb AAW, Darain H, Rahman MU. Prevalence of work related musculoskeletal disorders among physicians, surgeons and dentists at tertiary care hospitals of Peshawar. *Ann Allied Health Sci*. 2016;2(1):5.
11. Latko WA, Armstrong TJ, Franzblau A, Ulin SS, Werner RA, Albers JW. Cross-sectional study of the relationship between repetitive work and the prevalence of upper limb musculoskeletal disorders. *American journal of industrial medicine*. 1999;36(2):248-59.
12. Devereux J, Buckle P, editors. Adverse work stress reactions – a review of the potential influence on work related musculoskeletal disorders (WMSDs). Proceedings of the Human Factors and Ergonomics Society Annual Meeting; 2000: SAGE Publications.
13. Fung IWH, Tam VVY, Tam CM, Wang K. Frequency and continuity of work related musculoskeletal symptoms for construction workers. *Journal of Civil Engineering and Management*. 2008;14(3):183-7.
14. Yu W, Ignatius T, Li Z, Wang X, Sun T, Lin H, et al. Work-related injuries and musculoskeletal disorders among factory workers in a major city of China. *Accident Analysis & Prevention*. 2012;48:457-63.
15. Bodhare T, Valsangkar S, Bele S. An epidemiological study of work-related musculoskeletal disorders among construction workers in Karimnagar, Andhra Pradesh. *Indian Journal of Community Medicine*. 2011;36(4):304.
16. Alghadir A, Anwer S. Prevalence of musculoskeletal pain in construction workers in Saudi Arabia. *The Scientific World Journal*. 2015;2015.
17. Punnett L, Wegman DH. Work-related musculoskeletal disorders: the epidemiologic evidence and the debate. *Journal of electromyography and kinesiology*. 2004;14(1):13-23.
18. Merlino LA, Rosecrance JC, Anton D, Cook TM. Symptoms of musculoskeletal disorders among apprentice construction workers. *Applied occupational and environmental hygiene*. 2003;18(1):57-64.
19. Holmström E, Engholm G. Musculoskeletal disorders in relation to age and occupation in Swedish construction workers. *American journal of industrial medicine*. 2003;44(4):377-84.
20. Goldsheyder D, Nordin M, Weiner SS, Hiebert R. Musculoskeletal symptom survey among mason tenders. *American journal of industrial medicine*. 2002;42(5):384-96.
21. Latza U, Karmaus W, Stürmer T, Steiner M, Neth A, Rehder U. Cohort study of occupational risk factors of low back pain in construction workers. *Occupational and environmental medicine*. 2000;57(1):28-34.
22. Holmström E, Lindell J, Moritz U. Low back and neck/shoulder pain in construction workers: occupational workload and psychosocial risk factors. *Spine*. 1992;17(6):663-71.
23. Kaminskas KA, Antanaitis J. A cross sectional survey of construction workers: an ergonomic approach. 2010.
24. Telaprolu N, Lal B, Chekuri S. Work related musculoskeletal disorders among unskilled Indian women construction workers. *Age (yrs)*. 2013;22(58.0):36.4-7.75.
25. Choi SD, Yuan L, Borchardt JG. Musculoskeletal Disorders Construction: Practical Solutions From the Literature. *Professional Safety*. 2016;61(1):26.