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Frequency of Musculoskeletal Pain Among Chefs Working in Restaurants of Lahore

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Author`s Contribution

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A B S T R A C T

Background: Work-related musculoskeletal pain arises in many occupations. Chefs working in restaurants perform the repetitive motion, forceful exertions in non-neutral body postures, which make them susceptible to musculoskeletal pain. This occupation needs to be evaluated for the chefs on the musculoskeletal pain scale for better understanding of their demanding job description in a restaurant which causes health problems.

Objective: To determine the frequency of musculoskeletal pain in chefs working in restaurants of Lahore.

Methodology: Cross-sectional survey design with convenient sampling technique was used. Numeric pain rating scale (NPRS) and the Nordic questionnaire was undertaken to determine the frequency among chefs working in different restaurants of Lahore. Inclusions of chefs were based on satisfying the criteria of age from 25-50, experience of 2 years or more and minimum working hours 8. While incomplete questionnaire, previous trauma or surgery to the site of pain or kitchen aid workers were excluded from the study. The data was gathered from the period of June 2018 till September 2018.

Results: This study includes n=200 male chefs. Mean and standard deviation of NPRS was 0.52 ± 1.35. 37(18.5%) chefs responded that they experienced pain within the past 12 months. Low back being the most affected region 12(8%), followed by region of neck 9(4.5%), shoulder 7(3.5%), wrist/hand 4(2.0%), knees 4(2.0%), hips/thighs 3(1.5%) ankle/feet 2(1.0%). The odds ratio of developing musculoskeletal pain if working >10 hours is OR=0.72 (0.08-6.2 95%CI). Significant association between the age groups and NPRS was found ($\chi 2=16.30$, p=0.012).

Conclusion: This study demonstrated that musculoskeletal pain is frequent in chefs, though it was found to be low on NPRS. Low back pain was found to be the frequent region of the complaint.

Keywords: *Frequency, Low Back Pain, Musculoskeletal Pain, Numeric Pain Rating Scale.*

Introduction

Work-related musculoskeletal diseases are described as physical work exercises or working environment conditions on the task that are liable to cause or adding injuries to the tendons, muscles, ligaments, and spine.[1] Exposure to factors consisting of exceptionally performing, again and again, replicating the vigorously powerful movements, ungainly or sustained operating stance, and quivering distressing the shoulder, hands, or palms are linked with the musculoskeletal disorders.[2] Due to the mismatch of work-related requirement and the limit of physical human body condition contingent on the bodily motion potentials, mechanical or ergonomics of work undertaking, as a rule, work-related musculoskeletal disorders then arise, these can lead up to intense injuries like breaking of the bone that can take place in between a working environment with many other problems which may take a long period to heal up. Which outcome from repeated introduction to increase or decrease power stack along an extended

period of work.[3] Taxi drivers are among one of the highest prevalence which are prone to have low back pain.[4]

Prevalence of musculoskeletal pain was found to be 88 % among college students was due to their frequent use of the computer.[5] A study was done in south Iran which shows the prevalence of musculoskeletal pain and the effect of work-related factors among employees working in oil factories. The study reported that the employees were experiencing pain in the knee, lower back and neck as the most affected region.[6] Another study was done among workers in Bangladesh working in a readymade garment factory. Through this study, they wanted to achieve the prevalence of pain experienced due to musculoskeletal origin. The result showed that lumbosacral and the neck region were the most complaints due to occupation. 46 females reported pain in the lumbosacral region (24.7%) and 44 females stated aching in the neck region (23.7%). 10 males reported pain in the neck region (21.7%) while 6 males responded reported pain in the knee region (13%).[7] Massage practitioner is also included as an occupation which may develop work-related musculoskeletal pain. A cross-sectional survey done by Yuh Jang et.al showed the prevalence of 71.4% in a sample of 161 massage practitioners experiencing musculoskeletal pain [8]. Another study was done in Cambodia whose objective was to find out the prevalence of musculoskeletal related symptoms in the workers of the clothing factory. The results of the study have shown the prevalence of 92% from 702 workers where the most common region affected was neck, lower back, and shoulders.[9] Musculoskeletal pain is one of the leading problems in many occupation and industries however cooking for many hours and performing and achieving many other objectives in the restaurant without any sufficient rest, standing for hours and performing challenging tasks involving both upper extremity and lower extremity makes it a heavy workload for a chef and most susceptible for acquiring the musculoskeletal diseases in multiple regions of a body.[10] Finger deformation has been documented as a most recurrent deformity in the chefs of Japan which were working in school lunch services. A prevalence of 47.3% was observed for finger deformity in 5719 chefs.[11] Miwako Nagasu et.al reported low back pain is among the common prevalent musculoskeletal problem in the chefs with a prevalence of 72.2% from 5835 participants.[12] Another cross-sectional survey performed across the cooks of nursery school showed the prevalence of epicondylitis was higher 11.5% among the cooks than the controls 2.5% where the controls were regarded as those who do not perform high repetitive movements of hands or arms. The odds ratio (OR>4.0) was more prevalent for cooks as compared to controls for lateral and medial epicondyle.[13]

Therefore, it was considered that the musculoskeletal pain among chefs will be found due to their repetitive forceful work-related movements of the body. The study aimed to investigate the frequency of musculoskeletal pain in chefs as well as which is the most frequent body region of the complaint.

Methodology

A cross-sectional study was done by using a convenient sampling technique to identify the frequency of musculoskeletal pain in chef working in restaurants of Lahore. Firstly, the consent form was given to the individuals before the start of the questionnaire. The informed consent form was approved by the University of Lahore Institutional review board. Outcomes were measured using the Nordic questionnaire for musculoskeletal pain. This questionnaire serves as self-administer in an ergonomics context and can be used to screen pain regions of the body. The initial part of the questionnaire is constructed to gather the demographic data of the participants, followed by assessing the musculoskeletal symptoms.[14] Further, Numeric pain rating scale was also used to record the intensity of pain experienced by the participants. This scale measures the intensity of pain on 11 points where 0= no pain and 10=worst possible pain.[15] Sample size collected was (n=250) chefs with Confidence level: 95% (1-α). Anticipated population proportion: 0.852 (P). Absolute precision required: 0.05 (d) and the calculation formula used was $n=[Z^{2}1-\alpha P(1-P)]/ d^{2}$.[16] Inclusion criteria comprise of age between 25-50, working 8 hours daily as a minimum and without any previous trauma or injury experienced at the region of pain. Exclusion criteria were having experience less than 2 years, kitchen aid workers, participants provided incomplete information. Both male and female chefs were to be included in the study,

however, only male chefs were present in the restaurant's kitchen to fill the questionnaire. From 250 questionnaires, 50 were not included in the data analyzation due to incomplete information. Data were analyzed using SPSS version 23.0. Mean and the standard deviation was calculated for quantitative variables like age, NPRS, hours work, while, qualitative variables such as socioeconomic status, marital status and effected region were presented in the form of frequencies and percentages. Statistical significance was considered at 0.05.

Results

In the total sample size collected of chefs (n=200), regarding the demographics of chefs; their mean & standard deviation of age was 31.35 ± 2.19, NPRS was 0.52 ± 1.35 and working hours per day of Chef were 8.6 ± 0.89. Frequency of marital status; unmarried 107 (53.6%) and married 53 (26.4%), 40(20%) didn't report their marital status. Their socio-economic status; majority of chef were from middle class with the frequency of 87 (43.6%), 64(32%) from upper class and 43 (21.6%) from lower class.

37(18.5%) responded had experienced pain due to working as a chef in a restaurant and 163 (81.5%) reported no pain. Intensity of pain was experienced mostly mild as measured on NPRS (Table-I)

Answers to qualitative variables asked in the questionnaire which reports only 1(0.5%) respondent was hospitalized because of the pain while rest of the respondents 199 (99.5%) reported that they were never hospitalized due to pain. On answering have you ever changed your job because of the pain or discomfort, all the respondent answered negatively. 37(18.5%) respondents had trouble, pain, ache discomfort during the past 12 months while 163(81.5%) did not. 2(1.0%) had pain at the day of filling the questionnaire, while 198(99.0%) chefs did not. All the chefs were not restricted from performing their usual task due to the problem. 15(7.5%) responded that they have seen doctor, physiotherapist or such persons because of trouble while 185 (92.5%) responded no. 8(4.0%) respondents have taken medication because of the trouble while 192(96.0%) responded no.

No significant correlation between hours and age was found r= -0.04 with *p-value*=0.5. The odds ratio of developing musculoskeletal pain if working >10 hours is OR=0.72 (0.08-6.2 95%Confidence interval). However, it has no significant effect as CI reports non-significance. The most affected region was low back followed by the neck and shoulder (Table-II). A significant association between the age groups and NPRS was found as reported (Table III) No significant association was found between hours work and NPRS as reported (Table IV)

Table I: Intensity of pain on NPRS. (n=200)

Numeric Pain Rating Scale	N(%)
No Pain	163 (81.5%)
Mild (1-3)	22 (11%)
Moderate (4-6)	14 (7%)
Severe (7-10)	1 (0.5%)

Table II: The affected region of chefs (n=200)

Region	Frequency (%)
Neck	7(3.5%)
Shoulders	4(2.0%)
Elbows	2 (1.0%)
Wrists/ Hands	4 (2.0%)
Low Back	8 (4.0%)
Hips/Thights	3 (1.5%)
Knees	2 (1.0%)
Ankles/Feet	1 (0.5%)
Shoulder And Lowback	1 (0.5%)
Shoulder And Knees	2 (1.0%)
Neck And Lowback	2 (1.0%)
Lowback And Ankle/Feet	1 (0.5%)
Total	**200**
Chi-square	16.30
p-value	0.012

Table III: Association between age and NPRS

		Numeric pain rating scale				Total
		no pain	mild (1-3)	moderate (4-6)	severe (7-10)	
Age	25-30	90	8	8	0	106
	31-35	61	13	5	0	79
	36-40	12	1	1	1	15
Total		163	22	14	1	200

Table IV: Association between NPRS and hours work							
		Hours work					
		8	9	10	11	12	total
NPRS	0	95	40	22	4	2	163
	1	8	3	3	0	0	14
	2	4	1	1	0	0	6
	3	1	1	0	0	0	2
	4	6	1	0	0	0	7
	5	4	0	1	0	1	6
	6	0	1	0	0	0	1
	7	1	0	0	0	0	1
Total		119	47	27	4	3	200
Chi square19.95			p-value0.86				

Discussion

Outcomes from our study reported the frequency of musculoskeletal pain among chefs working in restaurants of Lahore was 37(18.5%) among sample size (n=200). Where majority reported low back pain 12(8%), followed by the region of neck 9(4.5%), shoulder 7(3.5%), wrist hand 4(2.0%), knees 4(2.0%), hips/thighs 3(1.5%) ankle/feet 2(1.0%). Further, our result demonstrated that chefs with the complaint of musculoskeletal diseases experienced mostly mild pain. Prevalence per 10000 chefs found to be 1850 chefs. The current study shows the odds ratio of developing musculoskeletal pain if working >10 hours was found to be OR=.72 (.08-6.2 95%Confidence interval). This study also indicated a significant association between the age groups and NPRS which was found to be ($\chi 2=16.30$, $p=0.012$). However, our result reports that no significant association was observed between NPRS and hours of work

From the self-reported investigation done by Shankar Subramaniam & Shanmugam Murugesan. This study focuses extensively on lower back pain as this was the most prevalent musculoskeletal pain observed in kitchen workers. The sample was acquired from chief chefs (n=24), assistant cooks(n=80), kitchen aid workers(n=20). They reported that chief chefs have the highest frequency of lower back pain 19(79.2%) while assistant cooks, kitchen aid workers have a frequency of 50(71.4%) and 6(30%). Shankar et al. study also reported that the prevalence of musculoskeletal disorder across all the kitchen workers was 67.5%, wherein the region of the shoulder was 62.3%, in the region of the chest was 20.2%, the upper back prevalence was 21.2%, in the region of the thigh was 37.5% and the region of knee/foot shows the prevalence of 42.1%. However, our study was focused on chief chefs and did not include assistant cooks or kitchen aids. Further, low back pain was the most frequent region of pain in our study which is supported by the study of Shankar et al. Additionally, the difference of sample size or population demographic might have cause disparity in the prevalence rate.[17]

Another investigation showed that musculoskeletal symptoms are predominant among chefs in Chinese eateries in Taiwan. A helpful example of 765 participants was led in 2009. The outcomes demonstrated that 652 (85.2%) members announced that they had no less than one musculoskeletal symptom effect inside the earlier year. In contrast to our study, Liu L-W et.al. also recorded the number of hours spend by the cooks exercising as well as female workers were also included in the sample size while our sample had only male chefs. Further, our study reported the most frequently affected region was low back 12% where Liu L-W et.al. reported shoulder 63.5%. Though the difference in sample size is to be considered.[18]

A study done by Trang Hyunh showed musculoskeletal related pain among chef was frequent in the neck, lower back, and leg region. Of 27 chefs, 9 reported frequent neck pain 7 reported frequent low back pain, and the least frequent pain was experienced in the leg region by the chefs. In contrast, our study concluded different results as from Trang Hyunh study that the frequent pain in the low back was observed more in the sample of cooks However, the sample size of Trang Hyunh study compare to our study was small.[19]

A cohort-based study was conducted which look at the sample of chefs from the year 1998 to 2002. They collected the data of Chinese cooks from an insurance company to gather information regarding musculoskeletal related pain. The sample size gathered for chefs was 52,261. The occurrence rate reported for musculoskeletal pain every year out of 52,261 chefs was 25%. In which, the most reported region of pain was lower back. However, this was a cohort study that had a large sample size as compared to our study but with similar outcomes that lower back pain was more frequent in chefs. Additionally, Shiue HS et.al. also reported the OR of musculoskeletal diseases in cooks in relation to controls

(non-cooks) which our study couldn't provide except for hours work (>10 OR=.72, .08-6.2 95%CI).[20]

We find some comparison of our study with the previous literature which indicates that there is a finding of musculoskeletal related pain in chefs. However, there are limitations to our study as this study was conducted within a short period. Sample size needs to be large enough to include more age groups chefs as in our result heterogeneity of sample size among age groups can be found. Further, detail investigation about the chef's daily routine requires to be recorded as other activities might be the cause of musculoskeletal pain. Incidence by gender was not reported in our study as only male chefs were found during data collection. Including female chefs will allow us to understand if the female chefs are more likely to develop musculoskeletal pain as compared to male chefs. Additional observational studies are required with relative risk and odds ratio statistics to evaluate risk and preventive factors.

Conclusion

This study concluded that chefs might develop musculoskeletal disorders due to the nature of their work which includes standing for hours, strenuous movements and performing a challenging task where our result demonstrated that lower back pain is found with a slight predominance in chefs and there is no significant association between NPRS and hours work. But there is a significant association between age groups and NPRS.

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