Effects of Low Back Pain and Neck Pain on the Health Status of the Porter of Central Market Area of Kolkata

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ABSTRACT

Musculoskeletal disorders (MSDs) are a common health problem among the workers engaged in manual material handling (MMH). Studies have shown that these workers also suffer from lot of psychological stress also.The objective of the present study was to study the effects of low back pain (LBP) and neck pain on the health status of MMH workers. 210 male MMH workers were randomly selected in the Central Market area of Kolkata. Modified Nordic questionnaire on MMH was performed to assess the prevalence of LBP and neck pain. The SF-12 Short-Form Health Survey questionnaire was performed to assess the physical and mental health. The mean physical composite score (PCS) and the mean mental composite score (MCS) of the subjects were 36.7 (± 9.1) and 46.0 (±9.2) respectively. The PCS of the workers with LBP differed significantly ($P<0.05$) from those without LBP. PCS and MCS of the subjects with and without neck pain had no significant difference. But the MCS scores differed significantly between the workers with LBP only and workers with neck pain only. Regression analysis showed that LBP significantly affected the PCS ($P<0.05$).The mean PCS and MCS scores suggest that both the physical and mental health of the workers is poor. LBP was found to significantly affect the physical health while having no effect on the mental health. LBP was found to be a predictor for poor physical health. The effect of neck pain on health status of these MMH workers was found to insignificant.

Key words: Low back pain, Neck pain, Manual Material Handling, Nordic Questionnaire, SF12

INTRODUCTION

It is very well established fact that manual material handling (MMH) is one of the many risk factors that is associated with the development of work related musculoskeletal disorder (WMSDs).(1) MMH is also the most frequent and expensive cause of compensable workplace injuries loss.(2) Lower back is the most commonly affected body part globally. 37% of the low back pain is found to be caused due to work related factors (3).

The present study was conducted on the workers of a central market, Kolkata. These workers perform heavy material handling job everyday. The objective of the present study was to find out the prevalence of the musculoskeltal disorder among the manual material handling workers of the central market and to find the effects of lower back and neck pain on the health of the workers.

METHODS

Selections of subjects

The present study was carried out in a central market area of Kolkata, India. 210 male manual material handling workers from this market were randomly selected for the purpose of the current study. These workers regularly perform manual material handling (MMH) job in this market area. Workers who had less than five years of experience were excluded from this study.

Prevalence of musculoskeletal disorder

Standardized Nordic Musculoskeletal questionnaire was used to assess the prevalence of musculoskeletal disorder among the MMH workers.(4) Few questions were modified accordingly to suite the context of the present study population. The questionnaire was divided into four parts. 1) Questionnaire on the general information about the workers. 2) Questionnaire on their work and work related information. 3) Questionnaire on discomfort feeling. This included information about history of accidents, discomfort feeling, body parts affected. 4) Questionnaire on individual body parts that are MSD affected. This included information about accidents, absenteeism and intervention.

Assessment of physical and mental health

One of the popular and standard health outcome measuring questionnaire is the 36 item short form health survey (SF36). The analysis of this SF36 questionnaire gives two summary scores, Physical Composite Score (PCS) and the Mental Composite Score (MCS), which denotes the physical health status and the mental health status respectively (5). Short form Health Questionnaire (SF12) is a subset of this SF36 questionnaire which can produce the PCS and MCS without substantial loss of information (6). This SF12 questionnaire was used to assess the physical and mental health status of the workers.

Statistical analysis

The data were analyzed using the SPSS statistics package (version 20.0). students t test was performed to find out the significant difference between the PCS and MCS of the porters having low back pain/neck pain and not having low back pain/neck pain. One way ANOVA was performed to find out whether any significant difference exists among the four different study groups. Stepwise multiple regression analysis was performed to find out the most dominant predictors of the PCS and MCS. (7)

RESULTS AND DISCUSSION

The analysis MSD questionnaire revealed that the porters have pain symptoms in various parts of their body. Lower back was found to be the most affected body part with 68% of the porters reporting pain in that region. Lower back is followed by neck (56%) and knee (48%)

pain. The porters perform material handling jobs manually for an average 10 hours each day. The average weight a single porter has to carry each trip is about 120 kg. Also the load lifting technique of the porters is quite hazardous, as it consists of many repetitive motions and twisting and bending of the body. These factors contribute significantly towards the development of MSD. The questionnaire analysis also reveals that the prevalence of MSD is high.

Table 1: Demographic characteristics of the subjects (n=210)

Sl. No.	Parameters	Mean (SD)
1.	Age (years)	36.2 (8.75)
2.	Weight (Kg)	62.1 (8.71)
3.	Height (cm)	164.2 (6.28)

Analysis of the SF12 questionnaire revealed that the mean PCS of the porters is 39.7 (± 9.1) and the mean MCS is 46.0 (± 9.2). PCS and MCS below 50.0 indicate that the physical and mental health statuses of the porters are inadequate. In this study we wanted to find out that whether low back pain and neck pain affects these PCS and MCS.

Significant difference (p=0.03) was found between the PCS of the porters who had low back pain and who did not had low back pain. While no significant difference was found in the PCS of porters having neck pain and porters not having neck pain. In case of MCS no significant difference was found in both the above comparisons.

Further to see the combined effect of low back pain and neck pain the porters were grouped into four different groups. The grouping was done on the basis whether they had only low back pain, only neck pain, both low back pain and neck pain or they had neither low back nor neck pain. The mean PCS and MCS of these four different groups are compared in fig 1. One way ANOVA was performed to find out the difference in PCS and MCS among these groups. Result of the ANOVA shows that the groups differ significantly in their PCS (Table 2) but no significant difference was found in case of MCS (Table 4) among the four groups.

Table 2: Result of One way ANOVA of PCS of different groups

	Sum of Squares	df	Mean Square	F	p
Between Groups	667.573	3	222.524	2.751	**.044**
Within Groups	16660.307	206	80.875		
Total	17327.880	209			

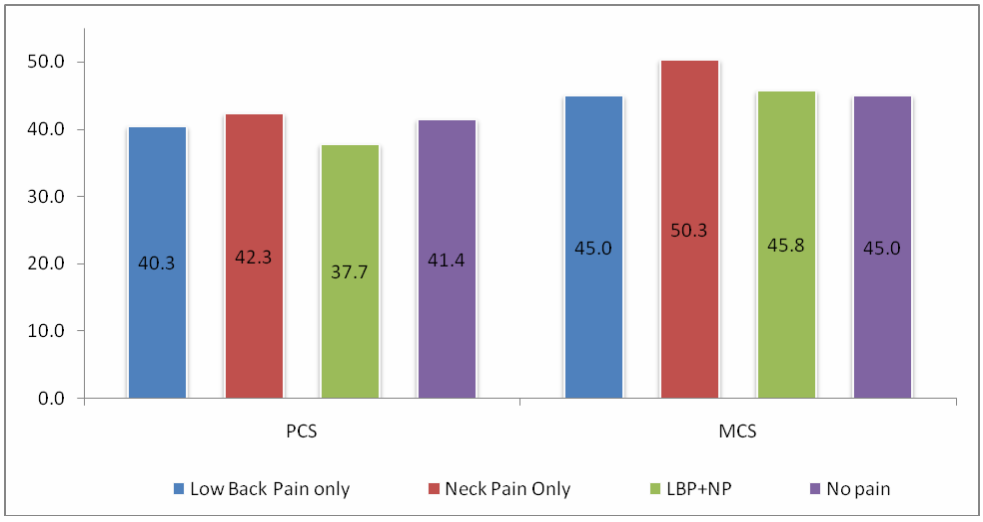

Fig 1 : Mean PCS and MCS of the four different groups of porters

This finding clearly suggests that low back pain and neck pain affects the physical health. On performing the LSD post hoc analysis (Table 3) it was found that the group which had both low back pain and neck pain differed significantly with the group having only low back pain and also with the group having no pain. The finding of the post hoc analysis is suggestive of the fact that low back pain affects the PCS more than neck pain. And low back pain and neck pain has no significant effect on MCS.

Table 3: Results of LSD post hoc analysis of the PCS of different groups

Groups (A)	Groups(B)	Mean Difference (A-B)	Std. Error	P
Low Back Pain only	Neck Pain Only	-1.9334	2.1332	.366
	LBP+NP	2.6085	1.5633	.097
	No pain	-1.0569	1.8913	.577
Neck Pain Only	Low Back Pain only	1.9334	2.1332	.366
	LBP+NP	**4.5419***	**1.9708**	**.022**
	No pain	.8765	2.2399	.696
LBP+NP	Low Back Pain only	-2.6085	1.5633	.097
	Neck Pain Only	**-4.5419***	**1.9708**	**.022**
	No pain	**-3.6654***	**1.7061**	**.033**
** The mean difference is significant at the 0.05 level*				

Table 4: Result of One way ANOVA of MCS of different groups

	Sum of Squares	df	Mean Square	F	p
Between Groups	586.340	3	195.447	2.368	.072
Within Groups	17000.816	206	82.528		
Total	17587.156	209			

PCS and MCS are not only the functions of low back pain and neck pain. Many other factors might also influence these summary scores. These scores may be influenced by age and years of experience. Therefore, to find out the relation between these predictors and PCS and MCS stepwise multiple regressions was performed. The independent factors were age, years of experience, low back pain and neck pain. Dependent factors were PCS and MCS. The result of the regression analysis showed that none of these predictors were able to explain the variance in the MCS. But in case of PCS low back pain alone was able to explain 27% of the variance significantly, while the other independent variables were excluded from the model. (Table 5)

Table 5: Results of the Stepwise multiple regression analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.164[a]	**.027**	.022	9.0037
a. Predictors: (Constant), Low Back Pain; excluded variable: age, years of experience, neck pain				

This study finding suggests that the physical health of the porters of the central market is significantly affected by low back pain, which is inevitable occupational hazard for them. Their working methods are hazardous and consist of awkward working postures. So the emphasis of the future research should aim at reducing the risk of development of MSD among these porters. This may result in better health status of the porters. Introduction of some engineering interventions can be one way to reduce the work burden.

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