ORIGINAL RESEARCH

Prevalence of low back pain and osteoporosis in health care workers after the COVID 19 pandemic

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ABSTRACT
Aim: Prevalence of low back pain and osteoporosis in health care workers after the COVID 19 pandemic.
Material and methods: The present prospective study was conducted among 300 apparently healthy adults who are working as a health care individual in the institute. A questionnaire addressing known risk factors for osteoporosis was made. The severity of the LBP was graded using a visual analogue scale for pain (VAS). The VAS is a reliable scale used to register the intensity of chronic pain where 0 signifies no pain and 10 signifies the worst pain imaginable. Those who had chronic LBP were also questioned on whether the onset of LBP preceded the Covid-19 pandemic, and whether the severity of the LBP had increased during the pandemic.
Results: Light, moderate, sedentary and vigorous physical activity was revealed in 50.1%, 33.6%, 11.1% and 5.2% of the subjects respectively. >1 hour sun exposure in a day was reported among 15.4% of the subjects.In this study, low back was found among 42.7% of the subjects. Mean BMD level was -0.49±2.40. Mean BMD level was lower in subjects having back pain, sedentary/vigorous physical activity and no sun exposure as compared to counterparts.
Conclusion: The confinement decreed due to the COVID-19 pandemic led to a significant increase in LBPintensity among health care workers.
Keywords: LBP, Health workers, COVID-19

INTRODUCTION
Low back pain (LBP) is a commonly occurring health problem with a reported worldwide prevalence and incidence of up to 20% and 7% respectively. Low back pain can be defined as activity limiting pain in the lower back, which may or may not be referred to the legs of at least one day's duration. In chronic low back pain (CLBP), the pain persists for more than three months. Personal, occupational and psychosocial risk factors for the development of back pain include age, gender, increased body mass index (BMI), heavy lifting, sitting stationary for long periods of time and low mood[1].
Healthcare workers are an occupational group who are highly exposed to both the occupational and psychosocial risk factors associated with LBP. In one study, the lifelong

prevalence of LBP in health workers of a state hospital in Turkey was identified as 53% with a point prevalence of 29.5% and was especially associated with personal and occupational factors[2-4]. It leads to sleeping disorders, disability, invalidity, work absenteeism, lack of productivity, and difficulties in carrying out the profession chosen by each worker[5].

Furthermore, it is entirely conceivable that this occupational group has been exposed to the heightened physical and psychosocial stresses of working in a hospital during the novel coronavirus (Covid-19) pandemic which, in turn, may have had an adverse impact on the severity of LBP[3-4]. COVID-19 pandemic caused by the SARS-CoV-2 virus has impacted the delivery of health care for people with spine-related symptoms[6].

In fact, Mattioli et al stated that quarantine measures have a negative impact on human beings in many aspects, which include (a) increased anxiety, anger, and stress; (b) decreased outdoor exercise and the overall amount of PA; (c) both stress and depression, which can lead individuals to adopt unhealthy dietary habits. Since many of these aspects are factors that worsen

LBP, as explained before, it is conceivable that during the COVID-19 quarantine, the prevalence of this condition has increased[7]. Hence in this context, the present study was conducted to appreciate the relation between decreased sun exposure due to the long indoor working hours, which leads to lowering bone mineral density causing Osteopenia and osteoporosis in old as well as young adult health care workers and rise of lower back pain.

MATERIAL AND METHODS
The present prospective study was conducted among 300 apparently healthy adults who are working as a health care individual in the institute. Study was conducted between July 2020 to September 2022.

INCLUSION CRITERIA
a. Health care workers above age of 18.
b. Persons who are willing to be a part of this study

EXCLUSION CRITERIA
a. Persons not willing
b. With history of trauma
c. With pre existing illness like TB, Osteoarthritis, Rheumatoid arthritis

OSTEOPOROSIS
They were subjected to bone mineral density testing and their t score was calculated and studied. A normal T score was in the range of -1 to 1. T score of -2.5 or lower indicates an established case of osteoporosis. Scores between -1 and -2.5 indicates low BMD and was called osteoporosis.

QUESTIONNAIRE
A questionnaire addressing known risk factors for osteoporosis was made. Interviews were conducted to ensure the respondents understand the questions well. Hospital personnel were reached and informed of the study by conducting departmental visits on three separate occasions after which the questionnaire was distributed via the intrahospital email system. It was stressed to staff that participation was of value to the study whether or not they suffered from LBP and that all surveys would be completed anonymously. Demographic characteristics, details of their role in the hospital, mode of transport to and from work, time spent at work, job satisfaction and past medical history was recorded.

The severity of the LBP was graded using a visual analogue scale for pain (VAS). The VAS is a reliable scale used to register the intensity of chronic pain where 0cm signifies no pain and 10cm the worst pain imaginable. Those who had chronic LBP were also questioned on whether the onset of LBP preceded the Covid-19 pandemic, and whether the severity of the LBP had increased during the pandemic.

STATISTICAL ANALYSIS

Data so collected was tabulated in an excelsheet, under the guidance of statistician.The means and standard deviations of the measurementsper group were used for statistical analysis (SPSS 22.00 for windows; SPSS inc, Chicago, USA).For each assessment point, data were statisticallyanalyzed using one way ANOVA. Difference between two groups was determined using student t-test and the levelof significance was set at $p < 0.05$.

RESULTS

Out of 300 subjects, there were comparatively more females (65.67%) as compared to males (34.33%). Maximum subjects were from the age group of 18-30 years (30.33%) followed by 31-40 years (20.67%) while minimum subjects were from the age group of >60 years (16%). 27% of the participants were students (table 1).

Table 1: Demographic profile among the study subjects

Variables	N=300	%
Gender		
Male	103	34.33
Female	197	65.67
Age Group (in years)		
18-30	91	30.33
31-40	62	20.67
41-50	56	18.67
51-60	43	14.33
>60	48	16.00
Occupation		
Doctors	32	10.67
Students	81	27.00
Nursing Staff	56	18.67
OT Staff	22	7.33
Engineers	14	4.67
Sweepers	53	17.67
Others	42	14.00
Questions		
Is patient a vegetarian? If yes, tick the type of foods consumed [Dairy products (milk, yogurt, cheese)]	231	77.00
Is patient a vegetarian? If yes, tick the type of foods consumed [Nuts and seeds (almonds, walnuts, pumpkin seeds, etc.)]	239	79.67
Is patient a vegetarian? If yes, tick the type of foods consumed [Legumes and beans (all beans, lentils, chickpeas, tofu, etc.)]	258	86.00
Is patient a non-vegetarian? If yes, tick the types of foods. [Lean meats (beef, lamb, pork, etc.)]	43	14.33
Is patient a non-vegetarian? If yes, tick the types of foods. [Poultry (chicken, turkey, duck, etc.)]	236	78.67
Is patient a non-vegetarian? If yes, tick the types of foods.	234	78.00

[Fish and seafood (Fish, prawns, crab, etc.)]		
Is patient a non-vegetarian? If yes, tick the types of foods. (red meat, poultry, at least once per month), and the total of meat and fish >1 time/week.	242	80.67

Table 2 shows the lifestyle and amount of sun exposure in a day. Light, moderate, sedentary and vigorous physical activity was revealed in 51.33%, 34.33%, 11.33% and 3% of the subjects respectively. >1 hour sun exposure in a day was reported among 14% of the subjects.

Table 2: Lifestyle and amount of sun exposure in a day

Variables	N	%
Lifestyle		
Light physical activity	154	51.33
Moderate physical activity	103	34.33
Sedentary	34	11.33
Vigorous physical activity	9	3.00
Amount of sun exposure in a day		
No Exposure	16	5.33
<30 minutes	139	46.33
30 minutes-1 hour	113	37.67
1 hour-3 hour	31	10.33
>3 hour	11	3.67

In this study, low back was found among 44.33% of the subjects. Mean BMD level was -0.49±2.40 (table 3).

Table 3: Does the patient have low back pain?

Low Back Pain	N	%
No	167	55.67
Yes	133	44.33
BMD Level	-0.49±2.40	

Mean BMD level was found to comparable between male and female. Mean BMD level was lower in subjects having back pain, sedentary/vigorous physical activity and no sun exposure as compared to counterparts. When mean BMD level was compared according to back pain, lifestyle and sun exposure, significant difference was found as p<0.05 (table 4).

Table 4: Mean BMD level according to various independent factors

Variables	Mean BMD Level	SD	t test	p value
Gender				
Male	-.379	2.53	1.54	0.21
Female	-.559	2.33		
Back Pain				
No	-0.21	2.79	23.39	<0.01*
Yes	-0.88	1.67		
Lifestyle			Anova test	p value
Light physical activity	-.741	1.878	4.48	0.004*
Moderate physical activity	-.305	3.087		
Sedentary	-.198	2.469		
Vigorous physical activity	-.018	1.159		
Amount of Sun Exposure				
No Exposure	-1.88	1.194		

<30 minutes	-.799	1.543		
30 minutes-1 hour	-.356	2.014	12.01	<0.01*
1 hour-3 hour	.726	5.009		
>3 hour	-.358	2.014		

*: statistically significant

DISCUSSION

To the best of our knowledge, this is one of the rarestudies which focuseson the effects of the Covid-19 pandemic on CLBP in hospital basedhealth care workers. Even though adverse psychological outcomesand physical symptoms in health workers during the covid-19pandemic have been studied, musculoskeletal complaints have not been addressed.

Out of 300 subjects, there were comparatively more females (65.67%) as compared to males (34.33%). Maximum subjects were from the age group of 18-30 years (30.33%) followed by 31-40 years (20.67%) while minimum subjects were from the age group of >60 years (16%). 27% of the participants were students. Light, moderate, sedentary and vigorous physical activity was revealed in 51.33%, 34.33%, 11.33% and 3% of the subjects respectively. >1 hour sun exposure in a day was reported among 14% of the subjects in the present study. Similar baseline characteristics were revealed by SelinOzenet al[8] in their study. The participants consisted of 120 physicians,119 nurses, 70 caregivers, 63 secretarial staff and 57 allied healthworkers (physiotherapists, health technicians). Of the studyparticipants, 108 (25.2%) were male and 321 (74.8%) were female.Average age of all study participants was 35.27 ± 9.70 years.

In this study, low back was found among 44.33% of the subjects. Figureis notably higher than the 23.8% LBP point prevalence observed by Alanziet al[9]in a cross-sectional community-based study in the city of Arar (northern Saudi Arabia). The target population of the study was composed of adults. Al-Arfajet al[10] reported a low back pain prevalence of18.8% in 2003 in the region of Al-Qassim (Saudi Arabia), which would confirm the increasing tendencyover time within the kingdom. However, our study´s LBP point prevalence was considerably lowerthan the 53.2% to 79.17% found by Awaji[11] in a review made using seven cross-sectional studiesconducted in Saudi Arabia. In other recent studies also undertaken in Saudi Arabia among specific professional groups, the point prevalence of LBP found was 80% in nurses, 57.3% in male high school teachers, 55% among faculty members, 40.5% in medical students, 51.6% in taxidrivers, 31.4% in office workers and 21.2% among health sciences students[12]. Hence, in most ofthese cases, the point prevalence was higher than in our study, which could be related to the burden ofwork, type of professional or academic activity carried out by each group, and poor posture at work[13].Worldwide, the LBP´s point prevalence found in countries such as Canada, the United States, Sweden,Belgium, Finland, Israel, and the Netherlands ranges between 1.4 and 20.0%[14].

COVID-19 quarantine has caused significantchanges in citizens´ lifestyles. While the number of times per week devoted to practicing PA decreased,the time spent sitting increased. Similarly, the percentage of individuals who reported more stressduring the quarantine was much higher than those who suffered more stress before the lockdown.Consequently, it can be assumed that the alteration of these three factors increased the incidence ofLBP.

Mean BMD level was -0.49±2.40. Mean BMD level was found to comparable between male and female. Mean BMD level was lower in subjects having back pain, sedentary/vigorous physical activity and no sun exposure as compared to counterparts. When mean BMD level was compared according to back pain, lifestyle and sun exposure, significant difference was found as $p<0.05$ in this study.Similarly, the association between PA and LBP has been examined byAlzahrani et al through a meta-analysis, where they found a lower LBP prevalence among thoseindividuals who regularly practiced PA. Taulaniemiet al[15]found that

exercise could reduce low back pain by improving lumbar movement control, abdominal strength, and physical functioning.

Peter Šagátet al[12] in their study showed that increased sitting time and stress and decreased weeklypractice of physical activity led to an increased LBP intensity since all the mentioned aspects are risk factors associatedwith LBP. However, it cannot be entirely ruled out that the sequence of events was the opposite. That isto say, the increase in LBP intensity might have been the cause but not the consequence of the decreasedweekly practice of PA or increased stress. However, what has been verified was that the quarantineincreased specific LBP risk factors and the prevalence of this musculoskeletal disorder. Therefore, it isnecessary to take measurements to reverse this situation without delay. As such, a greater negativeimpact on adult citizens´ quality of life can be avoided.

Finally, it is necessary to mention the limitations of the study. Due to the social distancing requirements, reduced mobility, and meeting restrictions, it was not possible to include certain measurements, such as inflammatory biomarkers and vitamin D levels, which could have provided relevant information regarding LBP risk factors, as observed in previous studies. Additionally, individuals suffering from chronic conditionsand subjects that were hospitalized were not included in the current research.

CONCLUSION

The confinement decreed due to the COVID-19 pandemic led to a significant increase in LBPintensity among health care workers. Back pain, sedentary/vigorous physical activity and no sun exposure was associated with lower BMD level.

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