ORIGINAL ARTICLE

Prevalence and Associated Factors of Low Back Pain among Clinicians of A Major Referral Hospital

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SUMMARY

Objectives: Low back pain (LBP) is one of the most common health problems faced by health care professionals due to their occupational lifestyle. This study aimed to quantify the prevalence of LBP among clinicians, and to identify its associated factors.

Methods: A cross sectional study was carried out in King Khalid University Hospital (KKUH) among 460 clinicians from different specialties. A validated questionnaire of 21 items was used to collect data. Chi-square test and odds ratios were used to observe and measure the association between categorical variables. Binary logistic regression by Wald method was used to identify independent factors associated with LBP (yes/no).

Results: The prevalence of LBP was found to be 59.4% (244) with 38% of them reported as severe. The distribution of prevalence among consultants, registrars and residents was 110 (45.1%), 91 (37.3%) and 43 (17.6%) respectively. Out of 114 (46.7%) surgeons who suffer from LBP we found, orthopaedic surgeons had 10.2% prevalence of LBP. Male clinician (odds ratio: 1.7; 95% Confidence Interval (CI): 1.1-2.8), consultant (4.1; 95% CI: 2.1-8.3), registrar (2.2; 95% CI: 1.2-4.2), more than 10 hours/week near bedside (1.8; 95% CI: 1.1-3.0), bending backwards at work (8.3; 95% CI: 5.1-13.4) and pulling objects during work (3.1; 95% CI: 1.7-5.6) were found to be independent statistically significant associated factors of LBP.

Conclusion: The high prevalence of LBP among clinicians and its associated factors indicates that clinicians should maintain good posture and avoid sudden movements during working hours in hospital to reduce this occupational health problem.

KEY WORDS:
Low back pain, clinicians, consultants, associated factors & referral hospital

INTRODUCTION

Low back pain (LBP) is the pain that is located in the lumbosacral region in the back, below the 12th rib and above the gluteal folds and it is an important public health issue as reflected by its high prevalence rates in many countries, and the costs associated with it.[1,2] The prevalence of reported LBP varies from country to country. For instance, LBP is considered a major health problem in Germany with an annual prevalence rate of more than 70%.[3] In Norway, the lifetime prevalence was reported to be about 69.9%, while in Sweden the prevalence is about 60.7%.[4] The incidence of LBP among hospital workers also varies among countries. In Tunisia, the lifetime prevalence of LBP among hospital workers is 57.1%.[5] In Kuwait the prevalence was reported as 70.9 %,[6] whereas in Ireland and Nigeria it was 46%.[7,8] In a study carried among gynaecologists, the prevalence of LBP was reported to be 72%, out of which 53% attributed it to their work.[9] In another study, orthopaedists and general surgeons have reported the pain problems with shoulder, lower back and neck.[10] In a survey of 697 ophthalmologists, it was reported that 39% of the study-subjects suffered from LBP.[11]

Occupational settings in general have a higher prevalence of LBP, especially the health care setting. LBP has been found to be a high risk probability in the health care sector compared to other occupational groups.[10-13] LBP along with neck and shoulder problems have been reported to be the complains of mainly the Orthopaedic and general surgery specialties in the medical field.[14] LBP has a huge economic impact in terms of productivity, employee absenteeism and of course in terms of medical care costs also.[15-18] It is estimated, that the number of lost production days in 1994-95 due to LBP in the United Kingdom was about 116 million days.[2] Besides different individual factors such as age and gender,[19,20] frequent heavy lifting, bending, twisting, prolonged standing and maintaining awkward postures are all identified risk factors for the development of LBP among medical staff.

No studies have been carried out to observe the prevalence of LBP among clinicians in Saudi Arabia. Therefore, the primary aim of this study was to determine the prevalence of LBP and the factors associated with this health problem among clinicians at a major referral hospital in Riyadh, Kingdom of Saudi Arabia.

MATERIALS AND METHODS

It is a cross sectional study, carried out in King Khalid University Hospital (KKUH) from May 2013 to August 2013. The KKUH is one of the major referral hospitals in Riyadh, Saudi Arabia. The subjects of the study were clinicians working at the position of consultant, registrar and resident. They were selected from their wards randomly during the one month period of data collection. The subjects were asked for

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their consent to participate in the study. About 460 clinicians from different specialties responded to fill a standardized questionnaire composed of 21 items. The questionnaire was validated by test and re-test method on a sample of 25 subjects.[21] The 21 items in our questionnaire included, personal characteristics, socio-demographic variables, position of the clinicians (consultant, registrar, resident), job history, smoking status, sports or extra professional activities, information about LBP (presence or absence of LBP, intensity, triggering factors and duration of LBP), factors in their jobs predisposing to LBP, factors in their usual lives in general predisposing to LBP, knowledge about triggering factors and prevention of their LBP. Ethical approval was obtained from Institutional Review Board to carry out the study (Reference no: 13/3956/IRB, dt: 23/12/2013). The sample size was calculated based on the assumption of 50% prevalence of LBW with ± 5% level of precision (width of 95% confidence interval); and at 0.05 level of statistical significance 384 study subjects were required. Anticipating about 20% non-response, the final sample size was enhanced to 460 subjects. Analysis was carried out using Statistical Package for Social Sciences (SPSS) version 21.0 software (SPSS Inc., Chicago, IL, USA). Descriptive statistic (mean, standard deviation, frequencies and percentages) were used to quantify the quantitative and categorical study variables. Pearson's chi-square test was used to observe the association between the categorical study variables and binary outcome variable. Odds ratios were calculated to measure the association. Binary logistic regression by forward Wald method was used to explore the independent factors associated with the binary outcome variable low back pain (yes/no). A p-value of <0.05 and 95% confidence intervals (CI) were used to report the statistical significance and precision of results.

RESULTS

Socio-demographic characteristics

Out of 460 clinicians from different specialties, 411 completed the questionnaires with a response rate of 89.3%. Age range of our study sample was between 20 and 50 years. Our study population consisted of 248 (60.3%) male and 163 (39.7) female. The distribution of specialty of study subjects is as follows: from surgical specialities 175 (42.6%), 164 from medical specialties (39.9%) and 72 from paediatric medicine (17.5%). There were 160 (38.9%) consultants, 159 (38.7%) registrars and 92 (22.4%) residents. Fifty seven (13.9%) physicians had been in service for 1 to 5 years, 52 (12.7%) physicians had been in service between 6 to 10 years, 136 (33.1%) from 11 to 15 years and 165 (40.1%) physicians had a service of > 15 years. About 236 (57.4%) of our study subjects had been doing physical activity and sports. 58 (14.1%) of our subjects picked aerobic exercises to be their type of sports they prefer doing usually. Whereas 97 (23.6%) chose weight lifting as their sports type, 34 (8.3%) chose jogging and 47 (11.4%) chose swimming as their favourite type of sports. (Table I)

Prevalence

Our data shows that, 244 (59.4%; 95% confidence interval: 54.5% to 64.2%) of physicians suffered from LBP. Out of the 244 clinicians who suffered from LBP, 38% rated their pain as severe, while only 28% rated their pain as moderate and 34% as mild. The prevalence of LBP in relation to 3 specialties (Medicine, Surgery & Paediatrics) was 32.8%, 46.7% & 20.5% respectively. Among consultants, 110 (68.8%) had LBP, 91 (57.2%) of registrars had LBP and only 43 (46.7%) residents had LBP. Out of 114 (46.7%) surgeons who suffer from LBP, we found that 25 (21.9%) were Orthopaedic surgeons, 23 (20.2%) gynaecologists, 15 (13.2%) general surgeons, 15 (13.2%) plastic surgeons, 14 (12.3%) urologists, and 22 (19.3%) were from other specialists who had LBP. And this distribution was not statistically significant (χ^2 =6.21, p=0.286).

Associated factors

Bivariate analysis shows the variables; age groups, job level and specialty of clinicians were highly statistically significantly associated with the LBP. The odds of a clinician who were in age groups of 31-40 years and > 50 years suffering with LBP was 2.2 (95% CI: 1.1-4.6) times and 3.0 (95% CI: 1.4-2.2) times more when compared with the clinician of age group <30 years. The odds of a clinician in the position of consultant, suffering with LBP was 2.5 (95% CI: 1.5-4.2) times more when compared with clinician in the positions of registrar and residents. And the odds of clinicians in the specialty of surgery and paediatrics suffering with LBP was 2.0 (95% CI: 1.3-3.0) times and 2.4 (95% CI: 1.3-4.3) times more when compared with the clinician in the medicine specialty. The other variables (gender, number of years of service, body mass index, and doing exercise) were not statistically significantly associated with LBP (Table II).

Table I: Distribution of Socio-demographic variables of study subjects

Socio-demographic variables	No. (%) (n=411)
Age groups(in years)	
< 30	37 (9.0)
31-40	158 (38.4)
41-50	52 (12.7)
>50	164 (39.9)
Gender	
Male	248 (60.3)
Female	163 (39.7)
Job position	
Consultant	160 (38.9)
Registrar	159 (38.7)
Resident	92 (22.4)
Specialty	
Medicine	164 (39.9)
Surgery	175 (42.6)
Paediatric	72 (17.5)
Years in service	
1-5	57 (13.9)
6-10	52 (12.7)
11-15	136 (33.2)
>15	165 (40.2)
BMI	
Normal	191(46.5)
Obese	220(53.5)
Doing Exercise	
Yes	236 (57.4)
No	175 (42.6)

Table II: Association between Socio-demographic characteristics of clinicians and Low back pain

Characteristics	Low back pain		χ2- value	p-value	Odds ratio (95% C.I.,)
	Yes	No			
Age groups(in years)					
< 30	15(6.1)	22(13.2)	13.27	0.004	1.0
31-40	95(38.9)	63(37.7)			2.2(1.1,4.6)
41-50	24(9.8)	28(16.8)			1.3(0.5,2.9)
>50	110(45.1)	54(32.3)			3.0(1.4,2.2)
Gender					
Male	154(63.1)	94(56.3)	1.93	0.165	1.3(0.9,2.0)
Female	90(36.9)	73(43.7)			1.0
Job position					
Consultant	110(45.1)	50(29.9)	12.20	0.002	2.5(1.5,4.2)
Registrar	91(37.3)	68(40.7)			1.5(0.9,2.5)
Resident	91(37.3)	49(29.3)			1.0
Specialty					
Medicine	80(32.8)	84(50.3)	13.07	0.001	1.0
Surgery	114(46.7)	61(36.5)			2.0(1.3,3.0)
Paediatric	50(20.5)	22(13.2)			2.4(1.3.4.3)
Years in service					
1-5	30(12.3)	27(16.2)	6.97	0.073	1.0
6-10	25(10.3)	27(16.2)			0.8(0.4,1.8)
11-15	79(32.5)	57(34.1)			1.2(0.7,2.3)
>15	109(44.9)	56(33.5)			1.8(0.9,3.2)
BMI					
Normal	120(49.2)	71(42.5)	1.77	0.183	1.0
Obese	124(50.8)	96(57.5)			1.3(0.9,1.9)
Doing Exercise					
Yes	124(50.8)	91(54.5)	0.80	0.370	1.0
No	99(40.6)	76(45.5)			0.8(0.5,1.2)

Table III: Association between Clinicians work related variables and Low back pain

Work related variables	Low back pain		χ2- value	p-value	Odds ratio (95% C.I.,)
	Yes	No			
Number of working hours/week in clinic					
1 to 10	66(27.0)	67(40.1)	7.74	<0.001	1.0
> 10	178(73.0)	100(59.9)			1.8(1.2,2.7)
Number of working hours/week on bedside					
1 to 10	130(53.3)	91(54.5)	0.06	0.810	1.0
>10	114(46.7)	76(45.5)			1.1(0.7,1.6)
Bend your back at work					
Yes	190(77.9)	50(29.9)	93.74	<0.001	8.2(5.3,12.9)
No	54(22.1)	117(70.1)			1.0
Helping in patient transfer/shifting					
Yes	175(71.7)	112(67.1)	1.02	0.313	1.2(0.8,1.9)
No	69(28.7)	55(32.9)			1.0
During work pull objects often					
Yes	220(90.2)	115(68.9)	29.85	<0.001	4.1(2.4,7.1)
No	24(9.8)	52(31.1)			1.0

Table IV: Associated factors of Low back pain among Clinicians (By Multivariable analysis)

Associated factors	B	S.Error	Wald statistics	Adjusted Odds Ratio (95% C.I.)	p-value
Gender (Male)	0.53	0.25	4.54	1.7(1.1,2.8)	0.033
Position					
Consultant	1.42	0.35	15.95	4.1(2.1,8.3)	<0.001
Registrar	0.80	0.32	6.22	2.2(1.2,4.2)	0.013
Resident	--	--	--	1.0	--
Number of working hours/week on bedside (> 10)	0.58	0.27	4.62	1.8(1.1,3.0)	0.032
Bend your back at work (Yes)	2.11	0.25	73.94	8.3(5.1,13.4)	<0.0001
During work pull objects often (Yes)	1.12	0.31	12.80	3.1(1.7,5.6)	<0.0001

Model χ^2 =130.19(p<0.001)
Nagelkerke Pseudo R^2 = 0.54
Goodness of fit
Hosmer & Lemeshow =6.04 (p=0.642)

Variables included in the model: Age groups, Gender, Years of experience, position, specialty, number of working hours/week in clinic, number of working hours/week at bedside, bend your back at work, during work pull objects often & helping inpatient shift/ transfer

The work related variables of physicians also showed statistical significant association with LBP. Suffering with LBP among the clinicians who were working more than 10 hours per week in clinic, was 1.8 (95% CI: 1.2-2.7) times more than the clinicians working less than 10 hours per week in the clinic. The odds was 8.2 (95% CI: 5.3-12.9) times more for the clinicians who had acknowledged that they bend their back at work and were suffering with LBP, when compared with the clinicians who did not bend their back at work. Also the odds of suffering with LBP was 4.1 (95% CI: 2.4-7.1) times more among the clinicians who often pulled objects during their work, when compared with the clinicians who were not pulling the objects during their work. The other variables (number of working hours per week on bedside and helping in patient transfer) did not show statistical significant association with LBP (Table III).

In multivariable analysis, bivariate logistic regression by forward Wald method was used to predict LBP among clinicians using the significant variables found in bivariate analysis. A model with the variables: gender (male), position of clinician (consultant & registrar), number of working hours/week on bedside (>10), bending of back during work (yes), and pulling of objects during work (yes) against a model with only constant was statistically significant indicating that the above variables as a set distinguishing between the clinicians with and without LBP. (χ^2=130.19; p < 0.0001; df=6). Hosmer and Lemeshow test which tests for the goodness of fit for logistic regression models (an alternative to model chi-square test) had a value of 6.04 (p=0.642; df=8). As the p-value is greater than 0.05, it can be inferred that the model's estimates fit the data at an acceptable level. This non-significance indicates that the model prediction does not significantly differ from the observed. Nagelkerke's R2 of 0.54 indicates a moderately strong relationship between prediction and grouping. The Wald criterion demonstrated that the variables in the model at the step5 (as given in the table IV) made a significant contribution to the prediction of LBP. The final model validation was carried out using classification table which summarizes the observed group and predicted group classification. The overall prediction success was 74.9% (79% for LBP present and 68.9% for LBP absent). The receiver operating characteristic (ROC) curve analysis for assessing predictive probabilities gave an area under the ROC curve value of 0.8 (95% confidence interval: 0.7-0.9), indicating that the final model classifies the LBP group significantly better than by chance. Model diagnostics showed all the necessary assumptions were valid.(Table IV)

Severity of LBP

Severe LBP cases were 55% in paediatric specialty, 44.2% in medicine and 22.6% in surgical specialties. Moderate LBP cases were 45.3% in the surgical field, 20% in paediatric specialties and 18.2% in the medical field, while the mild cases were 37.7%, 32.1%, and 25% in medicine, surgery and paediatrics respectively. These differences are statistically significant (p=0.02).

DISCUSSION

This cross sectional study demonstrates that LBP is a common complaint among clinicians with a prevalence of 59.4%. Our study clearly demonstrates that surgeons have a higher prevalence than other specialties with 46.7%, and the highest prevalence is found among orthopaedic surgeons followed by gynaecologists. But this finding is in contrast with the finding from the study done in 2011 by Mohammad A. *et al* [22] which found that gynaecologists had the highest point prevalence followed by medical doctors and paediatricians (32.4% - 20.5%) respectively. Type of specialties also affect the degree of severity of LBP; 55% of paediatricians in our study were having severe LBP, while only 44.2% of the medical doctors in our study complained of severe LBP and 22.6% of the surgeons who had LBP rated it as a severe LBP. But LBP is more common in general population also and the findings of Cunningham C *et al* [7] indicate that there is no difference of LBP prevalence among health service and general population. Few available epidemiological studies on occupational injuries indicate that the prevalence of LBP in different specialties of clinical staff in a health care setting is

relatively high. [12-14] Also the high prevalence of LBP was reported among the other non-clinical staff and hospital workers. The lifetime prevalence of LBP among physical therapists in Kuwait was 70.9% [23] and 57.7% among hospital staff in Tunisia 5 and 50% among nurses in Iran. [24]

Even though high prevalence of LBP has been reported, the aetiology and nature of LBP are not well understood. Many risk factors are associated with prevalence of LBP among clinicians. In our study, advancing age was significantly associated with LBP, and it was reported by other authors.[5,25,26] This could be due to the declining resistance capacity to the regular work in advanced age. Ismail Bejia *et al* [5] in their study found that LBP was associated with the factors like age, gender, marital status, smoking, past medical LBP history, migraine, years of service, high BMI, and heavy weight lifting. Gender (male) in our study has an effect and is independently associated with the development of LBP. In our study, after multivariate analysis the variables; age, doing exercise, BMI, years of service and helping in-patient transfer were not significantly associated with the developing of LBP.

Many studies have reported a significant association between musculoskeletal disorders and work related factors. [27,28] Studies have shown that the prevalence of LBP among health professionals working in orthopaedic wards is higher where frequent patient transfer takes place. [29,30] Pulling heavy objects and bending someone's back at work are the most frequent factors contributing to severity of LBP. [31,32] As our study subjects included orthopaedic surgeons, bending their back for long periods of time and pulling objects were significantly associated with developing LBP , and it also increased the degree of severity of LBP. Our results shows that, 77.9% of our population who suffered of LBP stated that they do bend their backs at their works for long periods of time, and 90.2% of the medical staff who regularly pulled objects at their work had LBP. However, it was clearly found that among most of the clinicians for whom pulling objects was a regular task, had mild to moderate degree of pain in their lower backs. Our findings are in concordance with findings of study that was conducted by Mohammad A. *et al* [22] which found that repeated and awkward posture had an association with LBP. Another significant association we found was between the hours spent during the week in the clinic and the development of LBP, in which more than 10 hours per week increases the chance of having LBP. Not surprisingly, time spent standing near bedside also has an association to LBP, that is if someone stands more than 10 hours per week, the odds of developing LBP are higher, and these two findings are in concordance with finding of study done by MA Mohseni- Bandpei in 2006 [24] which found that working history (duration) and prolong standing have significant correlation with LBP.

We acknowledge some of the limitations of this study. This cross-sectional study enabled a description of association between LBP and other variables, but cannot establish a causal relationship. This study consists of a sample of clinicians from one referred hospital. This may affect generalizability of results. Our data was based on self-report; therefore recall bias may result in respondents with a history of LBP exaggerating their exposure to associated factors.

CONCLUSION

From the results of this study, we conclude that LBP is prevalent among clinicians, particularly in surgeons and the highest prevalence appears to be among orthopaedic surgeons. Several independent risk factors such as gender (male), position (consultant, & Registrar), number of working hours per week near bedside (>10), bending the back at work, and pulling objects during work are significantly associated with LBS. With this evidence of prevalence and associated risk factors of LBP among clinicians, appropriate steps should be taken to prevent this occupational health problem. We recommend ergonomic assessment of work place factors and periodic counselling sessions towards the greater use of their back with appropriate posture. Future large scale studies are warranted to further explore and validate the associations found in this study.

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