

Lower Back Pain among Health Care Workers in Operating Room at Al- Fateh Children's Hospital: Prevalence and Risk Factors

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Authors' contributions

This work was carried out in collaboration between both authors. Author HM designed the study, wrote the protocol, collected the data and performed the statistical analysis. Author AM wrote the first draft of the manuscript, managed the analyses of the study, managed the literature searches, editing and reviewing of the data and study. Both authors read and approved the final manuscript.

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ABSTRACT

Lower back pain (LBP) is recognised as a cause of morbidity in the developed nations in different occupational situations specifically, in health care workers (HCWs) including physicians, nurses and technicians, who are vulnerable to LBP. About 60–80% of the general people suffer from LBP at some time during their lives. However, there is not enough care about workplace health and safety problems facing the health care workforce in developing nations such as Libya. Thus, work-related issues among health care workers (HCWs) in operating room at Al-Fateh Children's Hospital in Benghazi city, Libya are described in this study.

Methods: Cross-sectional data were collected through a questionnaire that included four classes: work-related demographics, occupational injury/illness, reporting behaviour, and safety concerns.

Results: The health care workers experience a higher prevalence of lower back pain (LBP)

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complaints (87%), due to no proper policy related to LBP, the job nature has exposed them to this health issue. Main contributing factors which can increase the risk exposure of LBP were age, occupation and lifting objects, equipment and patients. The main concerns were overload and work stress.

Conclusion: In Libya, health care workers (HCWs) are considered as a critical health and safety concern, as a result of the weakness of policies in healthcare organisations. Thus, a proper no weight lifting policy should be considered. If not, proper manual lifting must be implemented.

Keywords: Lower back pain; work-related illnesses; musculoskeletal injuries; nurses health issues.

1. INTRODUCTION

Lower Back Pain (LBP) can generally affect many people at some point in their lives. Lower Back Pain (LBP) is also recognised as a cause of morbidity in the developed nations in different occupations, specifically health care workers (HCWs) including physicians, nurses and technicians, who are vulnerable to chronic LBP. [1]. This may be responsible for high treatment costs, sick leave, and individual suffering. In addition to being one of the main reasons for people to seek health care services [1,2]. Health care workers (HCWs) present high rates of work-related illnesses and injuries, in particular, Lower back pain (LBP) during performing duties. The mechanical hazards in the hospitals include manual lifting of patients, objects and equipment can cause the healthcare workers to be regularly affected by LBP [2-4]. High physical workload and work stress have recently added to this list of LBP causes [4]. In addition, demographic variables including age, gender, physical status, smoking and workplace stress can also threaten the HCWs to progress into LBP [5]. Also the main ergonomic factors are awkward postures, carrying and repositioning patients, prolonged standing, and working without sufficient breaks can significantly lead to LBP [5,6]. LBP remains the most common reason of early retirement, sickness absence, job changes among the workers [7]. Moreover, the HCWs in developing nations, are often required to lift and transport patients, objects and equipment in awkward situations and lifting aids are not always offered or feasible [7,8]. Thus, LBP is still the main concern disturbing the life quality and the work productivity [9]. Also risk of work related LBP are associated with working in operational room, where the highest LBP prevalence was in surgical department compared to other departments in hospitals [10,11]. LBP was predicated to cause 818.000 disabilities adjusted life years lost every year at workplace [12]. Furthermore, the prevalence of LBP among the HCWs in the operating room of the hospital was 78.1% [13]. Accordingly, This study was

carried out to determine the prevalence and risk factors of LBP among the healthcare workers (Operating room) in Al-Fateh Children's Hospital.

2. METHODS

2.1 Study Design

A descriptive Cross-Sectional study was conducted among health care workers at the operating room of the Al-Fateh children's hospital in Benghazi city, Libya.

2.2 Data Collection

Data were collected through using a designed questionnaire. For statistical analysis, the chi-square test was used to measure the association between independent variables and LBP and to identify the risk factors related to LBP. The study period was from December 2016 to January 2017.

2.3 Questionnaire Design

The questionnaire included 34 multiple choice questions. The following information was provided:

- Socio-demographic data: age, gender, educational level and marital status, smoking and working years (Experience).
- General information on occupation and workload: such as job description, job satisfaction, part-time work, shift work, night work, frequent lifting, awkward working posture, repetitive movements.
- Prevalence and duration of lower back complaints: including severity of LBP, occurrence of LBP, hospitalisation or job change due to LB, effects on work and leisure time activities, sick leave, medical history, current LBP, problems due to LBP, conducting training program, intervention program and general awareness regarding LBP.

2.4 Sample Population

The total population in the surgical unit (Operating Room) in the different shift was 23 health care workers. Also, the participation rate (Response Rate) was 100%.

2.5 Statistical Analysis

The collected data were analysed by using IBM SPSS (The Statistical Package for Social Sciences) Version 22 Software. The percentage and frequency of demographic information were determined and compared. Chi-square also was used to determine the association between participants' characteristics, risk factors and LBP prevalence with a statistical significance level of $P < 0.05$.

2.6 Ethical Considerations

There were no ethical issues, but an application for ethical approval was made at Al- Fateh Children's Hospital Research Board in order to collect the data. Researchers informed the participants that taking part in the study was completely voluntary and no questions about their identity were asked.

2.7 Inclusion Criteria

The study included all workers who had worked for one year or more.

2.8 Exclusion Criteria

The study excluded workers with a history of back surgery before conducting job and pregnant female workers and workers with less than working year.

2.9 Limitation

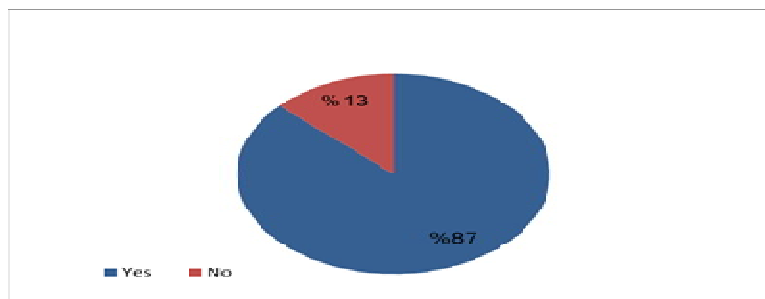
This study can be used as a pilot study and cannot be generalised and limited only to the specific.

3. RESULTS

A total number of 23 questionnaires were distributed and overall response rate of (N=23) 100% was achieved. Table 1 shows that the majority of the study subjects were nurses (n=16) 70%, physicians (n=6) 26% and only one technician. Most of them were females 70%. About of half of the HCWs 48% were at the age group of 31 to 40 years old. Also 44% of the HCWs were at age group of 21 to 30 years old. 47% of them, their qualification were diploma and 44% were Bachelor's degree. In addition, 40% had work experience less than or equal to 5 years and 35% had work experience from 16 to 20 years. Majority of the HCWs (70%) never exercise any type of sport.

The prevalence of LBP related to performing duty was 20 out of 23(87%) health care workers at this unit who clearly suffered from LBP. Table 2, presents the LBP severity of those affected (n=20), were 65% (mild pain), 30% (moderate pain), and 5% (severe pain). Most of the study subjects suffered from LBP at least once or twice a week/ a month. The frequency of complaining about LBP among the study subjects related to duty were 3 (Pre-on to post duty), 5 (On duty), 7 (On to post duty) and 5 (post duty). Also 85% of those HCWs described their LBP as localized, 10% with numbness pain and 5% suffered from pain of the leg/ buttock.

Table 3 shows that there was a significant association between LBP occurrence and job description (P-value= 0.032). However, the association between others socio-demographic characteristics of the HCWs in the operating room including gender, age, marital status, work years, smoking, qualification, work hours and work shift with LBP frequency was not significant. Based on P-values listed on this table, it was cleared that those variables were independent and did not affect one another.



Graph 1. The frequency of LBP (Prevalence of LBP)

Table 1. Socio-demographic characteristics of medical staff in surgical department

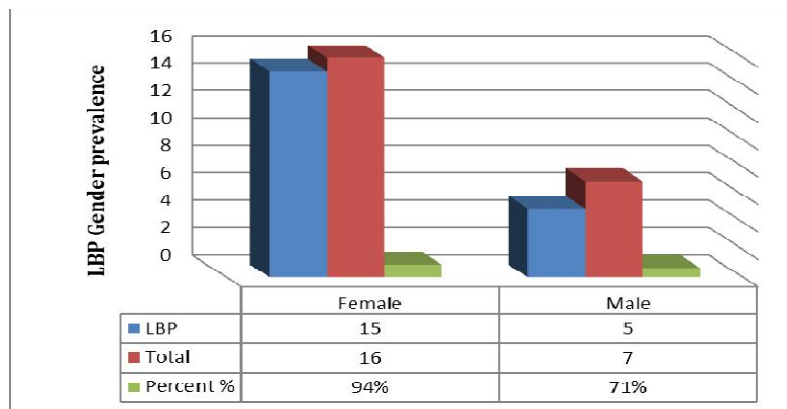
Characteristics	Category	Frequency	Percentage %
Occupation	Physician	6	26
	Nurse	16	70
	Technician	1	4
Gender	Male	7	30
	female	16	70
Age	21-30	10	44
	31-40	11	48
	41-50	1	4
	51-60	1	4
Experience (Working years)	0-5 years	9	40
	6-10 years	3	13
	11-15 years	1	4
	16-20years	8	35
	21-25 years	1	4
	more than 26 years	1	4
Qualification	Diploma	11	47
	Bachelor's degree	10	44
	postgraduate certificate	.	.
	Master	.	.
	PhD	2	9
Marital status	Single	10	43
	Married	13	57
	Divorce	.	.
Working hours	6 hours	11	48
	12 hours	9	39
	24 hours	3	13
Work shift	Day shift	12	52
	Rotatory shift	11	48
Are you smoking	Never	17	74
	Current smoker	3	13
	Previous smoker	3	13
Exercise	None	16	70
	Everyday	4	17
	weekly	2	9
	monthly	1	4

Table 2. Prevalence and severity of LBP

Variable	Category	Frequency	Percentage %
LBP	All the time	7	35
	Once /twice a week	8	40
	Once/twice a month	5	25
Severity of LBP	Mild	13	65
	Moderate	6	30
	Severe	1	5
Complaining LBP related to duty	Pre on to post duty	3	15
	On duty	5	25
	On to post duty	7	35
	Post duty	5	25
LBP Description	Localized LBP	17	85
	LBP with numbness	1	5
	Pain of the leg/buttock	2	10

Table 3. The association of LBP prevalence and socio-demographic characteristics

Characteristics	Category	LBP frequency			P- value < 0.05
		All the time	Once/twice a Week	Once/twice a month	
Occupation	Physician	.	5	1	0.032
	Nurse	6	3	7	
	Technician	1	.	.	
Gender	Male	3	2	2	0.693
	Female	4	6	6	
Age	21-30	3	3	4	0.628
	31-40	3	4	4	
	41-50	1	.	.	
	51-60	.	1	.	
	0-5	2	3	4	
Experience Years	6-10	1	1	1	0.724
	11-15	1	-	-	
	16-20	2	3-	3	
	21-25	1	.	.	
	<26	.	1	.	
Qualification	Diploma	5	3	3	0.198
	BSc	2	3	5	
	Postgraduate	.	.	.	
	Master	.	.	.	
	PhD	.	2	.	
Marital status	Single	3	4	4	0.88
	Married	4	5	3	
	Divorce	.	.	.	
Working hours	6 hours	5	2	4	0.394
	12 hours	2	5	2	
	24 hours	.	1	1	
Work Shift	Day shift	5	3	4	0.418
	Rotatory shift	2	5	4	
	Never	4	7	6	
Smoking	Current	3	.	.	0.077
	Previous	.	3	.	
Exercise	None	5	6	5	0.247
	everyday	2	2	.	
	weekly	.	.	2	
	monthly	.	.	1	

**Graph 2. The prevalence of LBP (By gender)**

Almost of 87% the study subjects suffered from LBP and 13% subjects had not suffered LBP in the operating room of this hospital, as presented in Graph 1.

Graph 2 shows that the prevalence of LBP among females was greater than males by 94% and 71% respectively.

Table 4 presents the effect of LBP on personal life and duties of the HCWs, data determined that 30% had no effect on their personal life and duties. Also, 48% had little effect of LBP on their personal life while 52% had little effect of on their duties. Seventy-eight percent (78%) suffered from restriction of activity and movement due to LBP. On the other hand, all of the study subjects did not modify their job as a result of LBP. But only 17% were thinking of leaving their jobs and 78% never had sick leave due to LBP. In

addition, 39% stated that there was no sleep disturbance, 30% felt discomfort, 91% of study subjects did not receive any spine surgery during their life. Further, 9% (n=2) received spine surgery after conducting their jobs.

The association between knowledgeable levels of the health care workers and LBP frequency was not significant (P-value= 0.484) as presented in Table 5. It is clear that the two studied variables were independent and did not affect one another.

Table 6 shows that the association between conducting training of the healthcare workers and LBP frequency was not significant (P-value= 0.065) so it seen that the two studied variables were independent and cannot affect one another.

Table 4. Low back pain consequences

Variable	Category	Frequency	Percentage %
Effect of LBP on personal Life	No Effect	7	30
	Little Effect	11	48
	Moderate effect	4	17
	Severe Effect	1	3
Effect of LBP on Duties	No Effect	7	30
	Little Effect	12	52
	Moderate Effect	4	17
	Severe Effect	.	.
Sick Leaves due to LBP	Yes	5	22
	No	18	78
Modified job due to LBP	Yes	.	.
	No	23	100
Sleeping Disturbances	No	9	39
	Rare	2	9
	Insomnia	3	13
	Discomfort	7	30
	Interrupted sleep	2	9
Frequency percentage of nurse's comment about effects caused by their LBP	Restriction of Activity & Movement	18	78
	Taking Many Days off	.	.
	Thinking to Leave Job	5	22
	Restriction of Activity, Movement & Taking Many Days off	.	.
Receive any Spine Surgery	Yes	2	9
	No	21	91

Table 5. The association of knowledgeable level and LBP frequency

Knowledgeable level	LBP frequency			P-value < 0.05	Chi-Sq.
	All the time	Once/twice a week	Once/twice a month		
None	1	2	2	0.484	3.463
Little	6	4	5		
Knowledgeable	.	2	1		
Total	7	8	8		

Table 6. The association of training and LBP frequency

Training	LBP frequency			P-Value < 0.05	Chi-Sq.
	All the time	Once/twice a week	once/twice a month		
Yes	1	4	3	0.065	5.45
No	7	3	5		
Total	8	7	8		

Table 7. The association of working hours and LBP frequency

Working hours	LBP frequency			P-Value < 0.05	Chi-Sq.
	All the time	Once/twice a week	Once/twice a month		
6 hours	5	2	4	0.394	4.093
12 hours	2	5	2		
24 hours	0	2	1		
Total	7	9	7		

Table 8. The association of lifting objects/patients and LBP frequency

Lifting objects/patients	LBP frequency			P-Value < 0.05	Chi-Sq.
	All the time	Once/twice a week	Once/twice a month		
Yes	7	2	6	0.008	9.775
No	0	6	2		
Total	7	8	8		

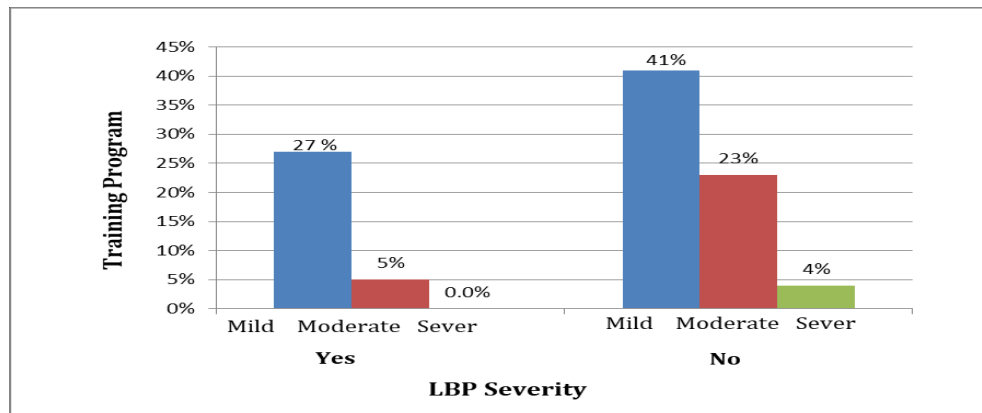
In addition, there was no association between working hours and LBP frequency (P-value=0.394, CI= 0.95) as presented in Table 7.

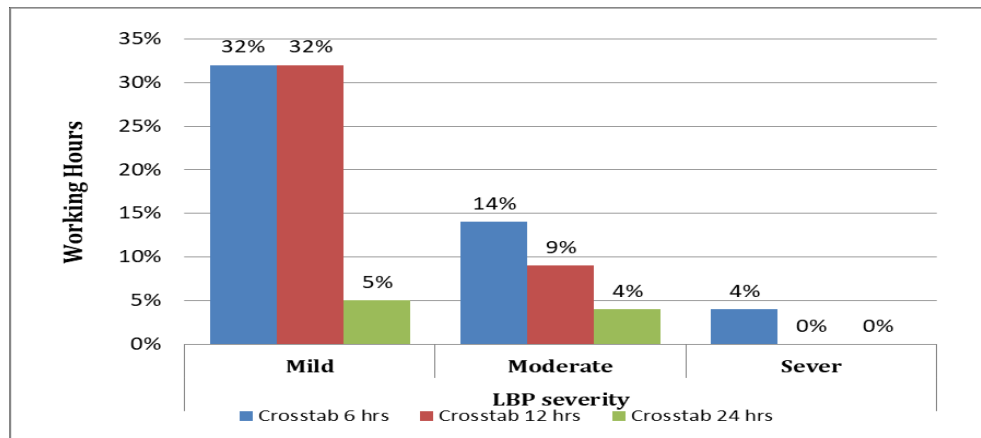
Moreover, Table 8 determines that LBP frequency among the HCWs in the operating room had a clear significant association with lifting objects, patients and equipment.

In Graph 3, the HCWs in the operating room did not conduct any safety training program regarding performing their duties properly, those

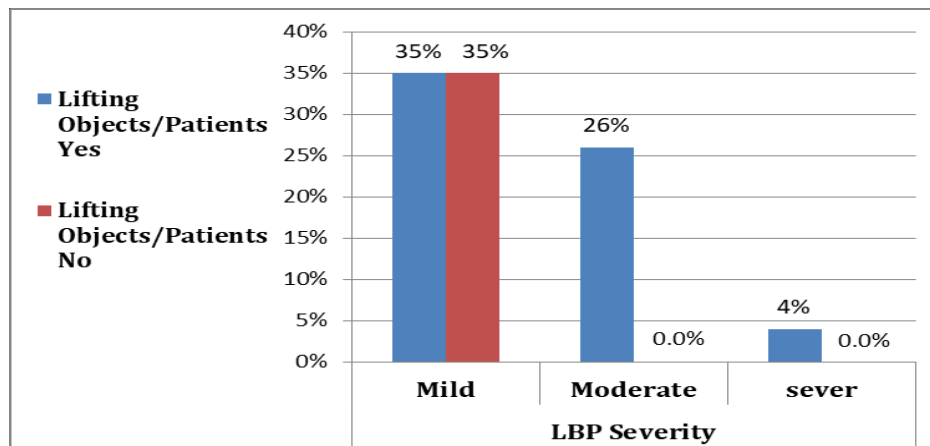
workers complained with (41%) mild LBP, (23%) moderate LBP, and (4%) sever LBP with (P-value= 0.547, Chi-Sq=1.56). Thus, there was no association among these variables.

Additionally, Graph 4 presented that there was no significant association between different working hours and the severity of LBP among the HCWs in this unit. Most of the HCWs worked 6 hours daily, suffered mild LBP (P-value= 0.788, Chi-Sq=1.71).

**Graph 3. The association of training program and LBP severity**



Graph 4. The association of working hours and LBP severity



Graph 5. The association of lifting objects/patients and LBP severity

The majority of the HCWs as presented in the Graph 5 suffered from mild LBP with 35% for each different group whether workers who performed lifting tasks or not. 26% of HCWs performed lifting tasks, suffered of moderate LBP. Accordingly, there was a significant association (P -value=0.04) between these variables.

On the other hand, the majority of demo-graphic factors including occupation, gender, marital status and etc in Table 9 did not present any significant association with LBP severity, except the age factor, which explored a clear positive relationship with LBP severity (P - value=0.001).

4. DISCUSSION

The outcome of this study shows that the prevalence of LBP related to performing duties at the operating room was high. This indicates that

there was a critical situation regarding the workers' health. An evidence (2017) in operating room showed that the prevalence of LBP among the health care workers in the operating room was 78.1% [14]. This result agreed with the outcome of another study in Libya (2016) which estimated that the prevalence rate of LBP was 55% among the HCWs in particular nurses at emergency department in Benghazi Medical Centre (BMC) [12]. Additionally, the prevalence rate of LBP among the HCWs over 12 months in hospital in Tunisia (2017) was 58.1% which is high and bringing light on importance of suitable ergonomic management policy [14]. A study also in 2017, showed that the HCWs experienced a higher prevalence of LBP and work- related musculoskeletal complaints because of no suitable management policy implemented in hospitals [13]. Accordingly, it is necessary to implement solutions for these risks and hazards at work and apply prevention actions of

Table 9. The association of demographic factors and LBP severity

Demo-graphic factors		LBP severity %			P-Value	Chi-Sq
		Mild	Moderate	Sever		
Occupation	Physician	6	-	-	0.209	5.87
	Nurse	4	11	1		
	Technician	-	1	-		
Gender	Male	4	3	-	0.418	1.75
	Female	12	3	1		
	21-30	7	3	-		
Age	31-40	8	3	-	0.001	23.4
	41-50	-	-	1		
	>60	-	-	1		
	0-5	7	2	-	0.565	8.65
	6-10	2	1	-		
	11-15	-	1	-		
Experience	16-20	1	2	4	0.270	5.17
	21-25	-	1	-		
	>26	1	-	-		
Qualifications	Diploma	6	5	-	0.314	2.31
	BSc	8	1	1		
	PhD	2	-	-		
Marital Status	Single	10	1	-	0.619	0.958
	Married	9	2	1		
	Day shift	7	4	1		
Work Shift	Rotatory	7	4	-	0.061	9
	Never	9	3	5		
	Current	-	3	-		
Smoking	Previous	3	-	-	0.842	2.72
	None	11	5	1		
	Daily	2	1	-		
Exercise	Weekly	2	-	-	0.842	2.72
	Monthly	1	-	-		

ergonomics at work. Most of demo-graphic factors of the study subjects including occupation, gender, and marital status did not show any significant association with LBP severity, except the age factor, that presented clear association with LBP severity as most old workers suffered LBP severity. These results are similar to the outcome of a study in BMC, the exposure to LBP increased among older age groups so the age factor is positively associated with chronic LBP. Also, a study among the HCWs of hospital in Bangladesh, found a positive association between age with chronic LBP [8,15]. Although there was no association of LBP and smoking severity of pain, and also no association between smoking frequency and LBP complains [14]. Previous studies displayed that individual factors including smoking can threaten them to progress LBP [7,8,14]. Moreover, LBP frequency and severity has a significant association with lifting objects and patients in the surgical unit of the current study. An evidence conducted in the hospitals include LBP from

manual lifting of objects, equipment and patients. Manual patients lifting can put medical staff as one of the occupations most affected by LBP [9]. Consequently, lifting task is considered as one of the main ergonomic factors that can threaten healthcare workers to progress LBP [7,8]. Moreover, the subjects of this study who suffered LBP, presented a significant association between LBP occurrence and occupation. More than half were nurses, so this can explain the reason of this association because of the duty of nurses in surgical unit so the job had exposed them to this problem. Without doubt, many studies mentioned that the HCWs were the highest LBP complaints [5,6,9,11]. This study also found that the majority of the study subjects did not perform any sort of exercise as the routine exercise can enhance body health, performance, and tolerance of quick fatigue and can clearly diminish the risk exposure to LBP. Another study in Libya had the same outcome regarding exercise [12]. Give an impression on the lifestyle of Libyans that it is relatively free of the culture of exercise.

5. CONCLUSION

The health care workers experience a higher prevalence of lower back pain (LBP) particularly among female, complaints due to no proper policy related to LBP. The job has exposed them to the health problem. Most of them showed the same intensity of complaints. Consequently, it might be suggested that LBP proceeds a recurrent rather than an aggravating course, which should be measured in the future management of LBP in the healthcare sector. It is supposed that improved managing strategies among the health care workers contribute to a large extent to these results. Longitudinal research and exploration will reveal supposed predictive factors.

6. RECOMMENDATIONS

- The prevalence of the problem is significantly high. Therefore, a proper no weight lifting policy should be considered. Hospitals should be well equipped with all necessary lifting equipment. All these might go a long way in reducing the high rate of LBP among healthcare workers.
- If it is not affordable to provide lifting equipment, the proper manual lifting policy must implemented.
- Implement and review education training course on back care ergonomics and patient transfer should be organized for the health care workers on regular basis.

CONSENT

It is not applicable.

ETHICAL APPROVAL

As per international standard or university standard, written approval of Ethics committee has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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