Prevalence and Risk Factors of Low Back Pain among Healthcare Staff in Operating Room at Al- Fateh Children Hospital

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Abstract

Low back pain (LBP) is recognized as a cause of morbidity in the developed nations in different occupational situations, in specific 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. Health care workers There is no enough care about workplace health and safety problems facing the health care work force in developing nations such as Libya. Thus, work-related problems among health care workers in operating room at Al-Fateh Children Hospital in Benghazi city, Libya are described in this study. **Methods:** Cross-sectional data were collected through a ~~questionnaire that~~questionnaire that ~~included four~~included ~~classes~~four classes: work-~~related demographics~~related demographics, occupational injury/illness, reporting behaviour, and safety concerns. **Results:** Health care workers experience a higher prevalence of low back pain (~~LBP) complaints~~LBP) 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, healthcare workers are considered as a critical health and safety concern~~s~~, as a result~~ing~~ of weakness of policies in healthcare organizations. **Recommendation:** The LBP prevalence is significantly high. Thus, a proper no weight lifting policy should be considered. If not, proper manual lifting must be implemented. Further research should investigate the work organization factors that contribute to these concerns and strengthen policies to encourage health and safety at work.

Key words: lower back pain, work-related illnesses, musculoskeletal injuries, Nurses health issues.

Introduction:

Pain is a protection mechanism designed to create the subject defending an injured part from other damage It refers as particular sensation.[NLM[1] Low back pain (LBP), perhaps more precisely called lumbago or lumbosacral pain, occurs below the 12th rib and above the gluteal folds (reference). Low back pain (LBP) is recognized as a cause of morbidity in the developed nations in different occupational situations, in specific in health care workers (HCWs) including physicians, nurses and technicians, who are vulnerable to LBP (reference). About 60–80% of the general people suffer from LBP at some time during their lives (reference). However, ~~an~~ evidence states~~d~~ that, health ~~care workers~~care workers (HCWs) present high rates of work-related illnesses and injuries,(1) Recent studies also showed that the main health concerns that can negatively impact the health and performance of health care workers was musculoskeletal injuries particulary~~in specific~~ Low back pain (LBP) during performing duties (reference). The mechanical hazards in the hospitals for ~~include~~ LBP include; ~~from~~ manual lifting patients and equipment that which ~~can~~ makes HCW~~s as a one of the~~ occupations the most affected by LBP.(2)(3) An evidence on ~~conducted the~~ mechanical hazards in the ~~hospitals include LBP from manual lifting of objects, equipment and patients~~ found~~ed~~ that patients lifting causes ~~put~~ medical staff to be regularly as affected ~~one of the occupations most affected~~ by LBP. (4) High physical work load and work stress ~~have recently~~have recently added to this list (reference). P~~p~~sychosocial variables including age, gender, physical status, smoking and workplace stress, are main ergonomic factors that can threaten them to progress into LBP includin~~g~~e awkward postures, carrying and repositioning patients, prolonged standing, and working without sufficient breaks.(5)(6) An evidence mentioned that LBP remains the most common reason of early retirement, sickness absence, job changes among the workers.(7) HCWs[NLM[2] are often required to lift and transport patients and/or equipment in awkward situation, particularly in developing nations as lifting aids are not always offered or feasible.(7)(8) Thus, LBP is still the main concern disturbing the life quality and 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 hospital.(10)(11) LBP[NLM[3] was predicated to cause 818.000 disabilities adjusted life years lost every year at workplace.(12) Moreover, the prevalence of LBP among healthcare workers in the operating room was 78.1%.(13) Accordingly, This study was carried out to determine the prevalence and risk factors of LBP among health care workers (Operating room) in Al-Fateh Children Hospital.

Methods

This study was conducted in the operating rooms of the Al-Fateh children hospital in Benghazi city, Libya[NLM[4]].

Study Design:

A descriptive cross-sectional study was conducted among health care workers at the operating rooms of the Al-Fateh children hospital in Benghazi city, Libya.

Data Collection:

Data was collected ~~through~~ using a questionnaire that was constructed ~~performed~~ in ~~English.~~ English. For ~~s~~Statistical analysis the ~~was performed by~~ chi square test was used to measure the association between independent variables and LBP (P-value<0.05, CI=0.95) and to identify the risk factors related to LBP.[NLM[5]] The study period was from December 2016 to January 2017.

Questionnaire Design:

The questionnaire include~~d~~s 34 multiple choice questions. The following information was collected~~provided~~:

- Socio-demographic data: age, gender, educational level and marital status, smoking and experience years; ~~.~~
- General information on occupation and work load such as, ~~:~~ job description, job satisfaction, part- time work, shift work, night work, frequent lifting, awkward working posture ,and repetitive movements; ~~.~~
- Prevalence and duration of low back complaints: including; ~~ever LBP~~, first occurrence of LBP, hospitalization or job change due to LBP, 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. The questionnaire was distributed to all participants by researchers. After a period of time [NLM[6]the researchers returned to collect the completed questionnaires.

Sample Population and Sample Size:

The total population in the surgical unit (operating ~~room)~~ room) in the different shift was 23 health care workers. We recruited all the 23 HCW give us a ~~Also, the~~ participation ~~rate~~and response rate of ~~(Response Rate) was~~ 100%.

Statistical analysis:

The collected data was analyzed by using IBM SPSS (The Statistical Package for Social Sciences) Version 22 Software. The percentage and frequency of demographic information was 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 $P<0.05$.

Ethical considerations:

There ~~was~~were no ethical issues however, ~~and applying for~~ ethical approval at (Mention where) was made in order to collect the data.

Inclusion criteria

The study includes all workers, who experience one year and more.

Exclusion criteria:

The study excludes workers with history of back surgery and pregnant female workers and workers with less than a year experience.

Results

This study had ~~found out the outcome of~~ 23 study subjects ~~in the purpose of determine the prevalence of Low Back Pain (LBP) among health care worker~~ in the operating rooms of the Al-Fateh children hospital. ~~and explore the potential risk factors associated with LBP. Table-1 presented that~~ the majority of the study subjects 69.6% (25) were nurses (Table 1) ~~by~~ ~~69.6%~~ while the rest of them were physician ats ~~by~~ 26.1% except only one technician. [NLM[7]Also 69.6% of the study subjects were females. Most of the study subjects ranged from 21 years to 40 years. 47.8 % their qualification ~~were~~was diploma and 43.5 were Bachelor

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

Characteristics	Category	Frequency	Percentage %
Occupation	Physician	5	15.2
	Nurse	25	58.5
	Technician	2	3.4
Gender	Male	6	4..3
	female	25	58.5
Age	21-30	2.	34.4
	31-40	22	36.7
	41-50	2	3.4
	51-60	2	3.4
Experience years	0-5 years	8	48.2
	6-10 years	4	24
	11-15 years	2	3.4
	16-20years	7	43.7
	21-25 years	2	3.4
	more than 26 years	2	3.4
Qualification	Diploma	22	36.7
	Bachelor's degree	2.	34.4
	postgraduate certificate	-	-
	Master	-	-
	PhD	1	7.6
Marital status	Single	2.	34.4
	Married	24	45.4
	Divorce	-	-
Working hours	6 hours	22	36.7
	12 hours	8	48.2
	24 hours	1	7.6
Work shift	Day shift	21	41.1
	Rotatory shift	22	36.7
Are you smoking	Never	26	64.8
	Current smoker	4	24
	Previous smoker	2	3.4
Exercise	None	25	58.5
	Everyday	3	26.3
	weekly	1	7.6
	monthly	2	3.4

Among the affected study subjects who suffered from LBP in Table-2, the severity of pain ~~were~~was 70 % (mild pain), 26 % (moderate pain), and 4 % (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 related to duty were
3 (Pre on to post duty) healthcare workers, 5 (On duty) healthcare workers, and 7 (On to post duty) healthcare workers. Thus, the prevalence of LBP related to performing duty was 20 out of 23 healthcare workers at this unit (87%). Also 74 % of ~~those healthcare~~those healthcare workers described their LBP as localized, 22% suffered from pain of the leg/ buttock and 4 % with numbness pain.

Table 2: Prevalence and Severity of LBP

Variable	Category	Frequency	Percentage %
LBP	All the time	6	4.
	Once /twice a week	7	44
	Once/twice a month	7	44
Severity of LBP	Mild	25	70
	Moderate	5	15
	Severe	2	3
Complaining LBP related to duty	Pre on to post duty	4	24
	On duty	4	11
	On to post duty	6	4.
	Post duty	4	11
LBP Description	Localised LBP	26	63
	LBP with numbness	2	3
	Pain of the leg/ buttock	4	11

Table 3- presente~~d~~sd that study subjects who suffered from LBP, there was a significant association between LBP occurrence and job description (P-value~~= 0.032~~= 0.032). However, the association between others socio-demographic characteristics of health care workers in the surgical unit including gender, age, marital status, experience, smoking, qualification, ~~work hours~~work hours and work shift with LBP frequency was not significant~~ce~~. Based on P-~~values listed~~values ~~on~~listed in ~~this~~ table 3, it was cleared that those stud~~yied~~ variables were independent and did not affect one another.

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	-	4	2	...41
	Nurse	5	4	6	
	Technician	2	-	-	
Gender	Male	4	1	1	..584
	Female	3	5	5	
Age	20-30	4	4	3	..517
	31-40	4	3	3	
	41-50	2	-	-	
	51-60	-	2	-	
Experience Years	0-5	1	4	3	..613
	6-10	2	2	2	
	11-15	2	-	-	
	16-20	1	4	4	
	21-25	2	-	-	
	<26	-	2	-	
Qualification	Diploma	4	4	4	0.198
	BSc	1	4	4	
	Postgraduate	-	-	-	
	Master	-	-	-	
	PhD	-	1	-	
Marital status	Single	4	4	3	0.880
	Married	3	4	3	
	Divorce	-	-	-	
Working hours	6 hours	4	1	3	..483
	12 hours	1	4	1	
	24 hours	-	2	2	
Work Shift	Day shift	4	4	3	..327
	Rotatory shift	1	4	3	
Smoking	Never	3	6	5	...66
	Current	4	-	-	
	Previous	-	2	-	
Exercise	None	4	5	4	..136
	everyday	1	1	-	
	weekly	-	-	1	
	monthly	-	-	2	

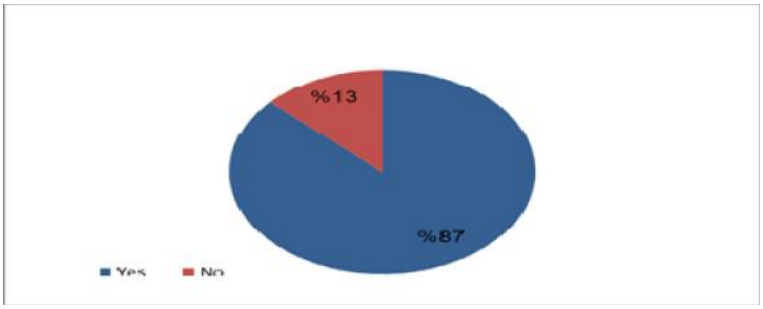


Figure (1): The Frequency of LBP (Prevalence of LBP)

Among all of (23) study subjects, 87 % (n=20) subjects suffered from LBP and 13% (n=3) subjects had not ~~been~~ suffered~~ing~~ from LBP in the surgical unit of the hospital.

Table 4: Low Back Pain consequences

Variable	Category	Frequency	Percentage%
Effect of LBP on personal Life	No Effect	6	4.
	Little Effect	22	37
	Moderate effect	3	26
	Severe Effect	2	3
Effect of LBP on Duties	No Effect	6	4.
	Little Effect	21	41
	Moderate Effect	3	26
	Severe Effect	-	-
Sick Leaves due to LBP	yes	3	26
	no	27	67
Modified job due to LBP	yes	-	-
	no	14	2..
Sleeping disturbances	no	8	48
	Rare	1	8
	insomnia	4	24
	discomfort	6	4.
	interrupted sleep	1	8
Frequency percentage of nurse's comment about effects caused by their LBP	restriction of activity and movement	27	67
	taking many days off	-	-
	thinking to leave job	3	26
	restriction of activity, movement and taking many days off	-	-
Receive any spine surgery	Yes	1	8
	No	12	82

Table-4 presented the effect of LBP on personal life and duties of health care workers, data determined that 30 % of the target group had no effect whether on their personal life and their 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 %) of them suffered with restriction of activity and movement due to LBP. On the other hand, all of them did not modify their job as result of ~~due to suffering~~ LBP but only 17 % were thinking of ~~to~~ leaving~~e~~ their jobs and 78 % never had sick leave due to LBP. In addition, 39 % stated that there was no sleep disturbance while 30 % felt discomfort. Further, 91% of study subjects did not receive any spine surgery during their life.

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	2	1	1	..373	3.463
Little	5	4	4		
Knowledgeable	-	1	2		
Total	**7**	**7**	**8**		

~~Also t~~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 ~~cleared that~~cleared that the two studied ~~variables were~~variables were independent and did not affect one another.

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	0	4	3	0.065	5.45
No	7	3	5		
Total	7	7	8		

Table-6 showsed that the association between conducting training of the health care workers and LBP frequency was not significant (P-value= 0.065) so it is seen that the two studyied variables arewere independent and cannot affect one another. Also, LBP frequency had a significant association with lifting objects and patients in this unit (Table-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.

[NLM[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	1	1		
Total		7	8	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		

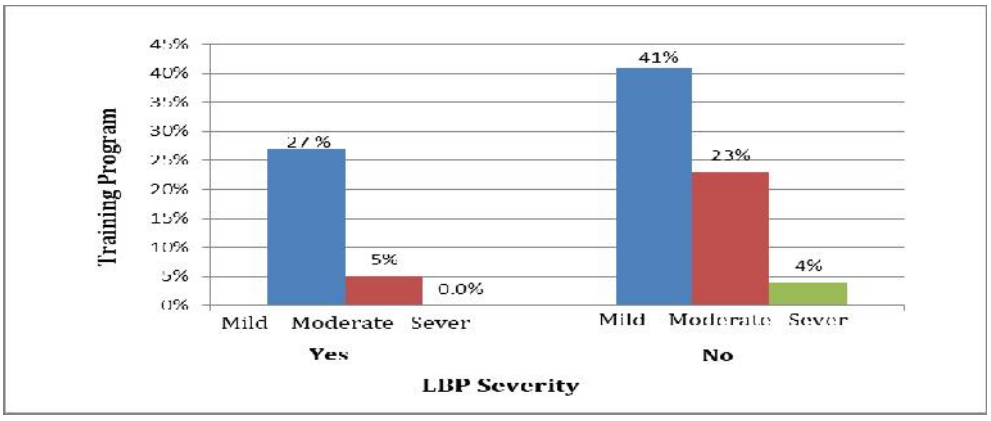


Figure (2): The association of Training program and LBP Severity

In the figure-~~2, the~~2, the health care workers in the surgical unit did not conducted any training program regarding performing their duties properly, 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, figure-3 presented that there was no significant association between different working hours and the severity of LBP among the health care workers in this unit as most of them suffered mild LBP even though their working hours were 6 hours daily (P-value= 0.788, Chi-Sq=1.71)

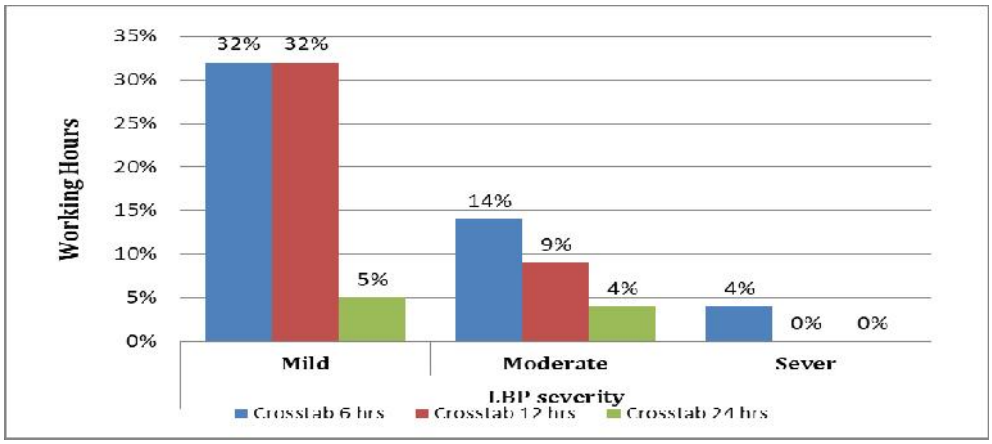
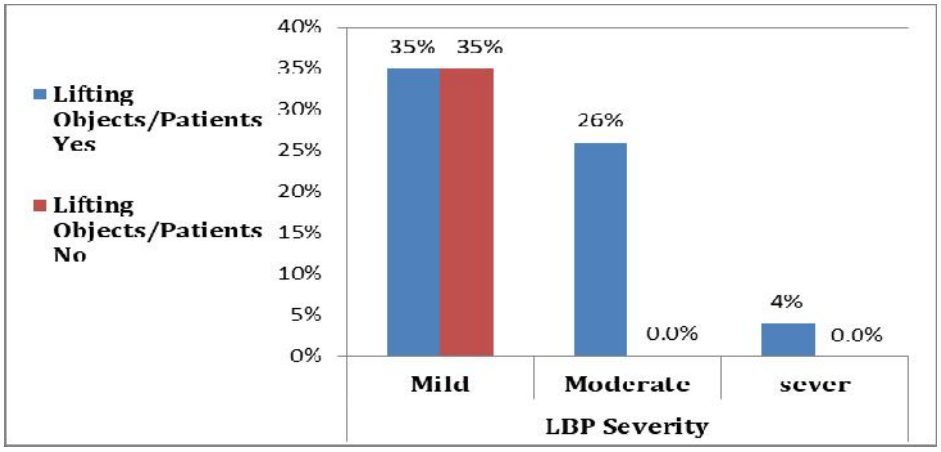


Figure (3): The association of Working hours and LBP Severity



Figure(4): The association of Lifting Objects/Patients and LBP Severity

The majority of the health care workers as presented in Fig-4 suffered from mild LBP with 35% for each different group whether workers who performed lifting tasks or not. 26% of health care workers who performed lifting tasks, suffered of moderate LBP. Thus, there was a positive 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 (Table-9) did not present any significant association with LBP severity, except the age factor, which explored clear positive relationship with LBP severity (P- value=0.001).

Table 9 : The association of Demographic Factors and LBP Severity

Demo-graphic Factors		LBP Severity %			P-Value	Chi-Seq
		Mild	Moderate	Sever		
Occupation	Physician	26	0	0	0.209	5.87
	Nurse	44	22	4		
	Technician	0	4	0		
Gender	Male	27	13	0	0.418	1.75
	Female	52	13	4		
Age	21-30	30	13	0	0.001	23.4
	31-40	35	13	0		
	41-50	0	0	4		
	>60	4	0	1		
Experience	0-5	31	9	0	0.565	8.65
	6-10	9	4	0		
	11-15	0	4	0		
	16-20	26	4	5		
	21-25	0	4	0		
	>26	4	0	0		
Qualifications	Diploma	26	22	0	0.270	5.17
	BSc	35	4	4		
	PhD	9	0	0		
Marital Status	Single	26	17	0	0.314	2.31
	Married	44	9	4		
Work Shift	Day shift	35	13	4		

	Rotatory	35	13	0	0.619	0.958
Smoking	Never	62	14	5	0.061	9
	Current	0	14	0		
	Previous	5	0	0		
Exercise	None	48	17	4	0.842	2.72
	Daily	9	9	0		
	Weekly	9	0	0		
	Monthly	4	0	0		

Discussion

The outcomes of this study showspresented that the prevalence of LBP related to performing duties ~~y~~ was ~~87%~~ among [NLM|9] ~~of~~ health care workers at this unit was high. This indicates that there was a critical situation regarding the workers' health. An evidence in operating room showed that the prevalence of LBP among nurses in the operating room was 78.1%.[13] This result agreed with the outcome of another study in Libya (reference2016) found out that the prevalence rate of ~~to~~ LBP was 55 % among nurses at emergency department in Benghazi Medical Centre (BMC).[10] Additionally, the prevalence rate of LBP among nurses over 12 months in hospital in Tunisia (2017) was 58.1% which is high and bringing light on importance of suitable ergonomic management policy.[13] A study also in 2017, ~~showed that~~showed that nurses experience a higher prevalence of LBP and work-related musculoskeletal ~~complaints~~ complaints because of no suitable management policy implemented in ~~hospitals.~~hospitals.[11] Accordingly, it is ~~necessary~~ necessary to ~~implement solutions~~implement solutions for these risks and hazards at work and apply prevention actions of ergonomics at work.

The majority of demo-graphic factors of ~~this current~~this ~~study~~current ~~subjects~~study ~~including~~subjects including

occupation, gender and , marital status and etc do not showed any significant association with association with LBP severity, except the age factor, that presented a clear association with LBP severity as most old workers were suffered workers suffered LBP severelity. These results are similar to the outcome of a study in BMC as it hads been found, that the exposure to LBP increased among older age groups so the age factor is presented positively associated with chronic LBP.(6)(10) Also, a study among nurses in hospital in Bangladesh, where found a positively association between age with chronic LBP.(12) Although in the current study there was no association of LBP and smoking severity of Pain, and also no association between smoking frequency and LBP complains (p-value= 0.077)., pPrevious studies displayed that individual factors including smoking can smoking can threaten them to progress LBP.(5)(6)(12)

Moreover, LBP frequency and severity had 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 (reference). This evidence found that found patients that lifting patients lifting put medical put medical staff in specific nurses as one of the occupations most affected by LBP. (7) Accordingly, Lifting Accordingly, task Lifting is task is considered as one of the main ergonomic factors that can threaten healthcare workers to

progress LBP. [5][6] Moreover, the subjects of this study who were suffering from ~~LBP,~~ LBP, presented no ~~that there were~~significant association between LBP occurrence and occupation ~~(p-value= 0.032).~~ More than half were nurses so this explains the reason of this association because of the duty of nurses in surgical unit so the job has exposed them to this problem. Without doubt, many studies mentioned that healthcare workers in particular nurses were the highest LBP ~~complains.(~~complaints. [5][6][7][9] 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. ~~The another~~Another study in Libya had same outcome regarding ~~exercise.(~~exercise. [10] Give an impression on the lifestyle ~~of Libyans~~of Libyans that it is relatively free of the culture of exercise.

supposed predictive factors.

Conclusion

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

Recommendation

- The prevalence of the problem is significantly high. Thus, a proper ~~no weight~~no ~~lifting~~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 provision lifting equipment, proper manual lifting policy must implemented.
- Implement and review education training course on back care ergonomics and patient transfer should ~~be~~ be organized for nurses on regular basis.

References:

1. Maul et.al,' 2003 "Course of low back pain among nurses: a longitudinal study across eight years", *Occup Environ Med;*60:497-503 doi:10.1136/oem.60.7.497

2. Khudhir KM, Mahmood KA, Saleh KK and Hossain M. A cross sectional study to determine the prevalence and risk factors of low back pain among public technical institute staff in Kurdistan Region, Iraq [version 1; referees: 2 approved with reservations]. F1000Research 2017, 6:182.

3.Gropelli T& Corle K. 2011" Assessment of nurses' and therapists' occupational musculoskeletal injuries. *Medsurg Nurs.* ;20(6):297–303. [PubMed]

4. McNeely E. 2005, "The consequences of job stress for nurses' health: time for a check-up", *Nurs Outlook.*;53(6):291–9. doi: 10.1016/j.outlook.2005.10.001. [PubMed]

5. Blake et al, 2006, " Low back pain and occupation among Irish health service workers" *Occupational Medicine*; 56(7) 454-447

6. Freimann et al, 2013, "Risk factors for musculoskeletal pain amongst nurses in Estonia: a cross-sectional study", *BMC Musculoskelet Disord.* ;14:334.

7. Harber et al, 2014" Occupational low-back pain in hospital nurses", *J Occup Med*. 27(7):518–24. [PubMed]

8. Cesana et al, 2010" Risk evaluation and health surveillance in hospitals: A critical review and contribution regarding experience obtained at Garardo dei Tintori

Hospital in Monza", *Med ñLav*; 89(1): 23- 46.

9. Sikiru L & Hanifa S. 2010 "Prevalence and risk factors of low back pain among nurses in a typical Nigerian hospital. African Health Sciences; 10(1): 26 – 30

10. Mukhtad et al, " Prevalence and Risk Factors of Low Back Pain among Emergency Nurse Staff in Benghazi Medical Centre" Project, UOB 2016, Libya.

11. Abdulmujeeb AB, 2017 " Prevalence and Factors Associated with Low Back Pain among Healthcare Workers in Kibuli Muslim Hospital Kampala, Uganda" *Epidemiology*: 7:287.

12. Boughattas et al, 2017 " Low Back Pain among Nurses: Prevalence, and Occupational Risk Factors" *Occupational Diseases &Environmental Medicine*, 5, 26-37.

13. Sanjoy et al., 2017 "Occupational factors and low back pain: a cross-sectional study of Bangladeshi female nurses" *BioMed Central*.; 10:173.