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

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**Abstract**

Lower back pain (LBP) is recognized as a cause of morbidity in the developed nations in different occupational situations spsecifially~~, 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. However, 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'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) 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, as a result of weakness of policies in healthcare organizations. Thus, a proper no weight lifting policy should be considered. If not, proper manual lifting must be implemented.

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

**Introduction:**

Lower back pain (LBP) can generally affect many people at some point in their lives. ~~LBP is~~LBP is also recognized 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~~to chronic LBP.[1] This may be responsible for high treatment costs, sick leave, and individual suffering., ~~I~~In addition to being one of the main reasons for people to seek health care ~~services.(~~services. [1][2] Health ~~care workers~~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 health care workers to be regularly affected by LBP.[2][3][4] High physical work load 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 was78.1%.[13] Accordingly, This study was carried out to determine the prevalence and risk factors of LBP among the health care workers (Operating room) in Al-Fateh Children's Hospital.

## Methods

### 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.

### Data Collection:

Data were collected through using a designed questionnaire. For statistical analysis, the ~~test was used~~ 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.

### 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 work load: 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, hospitalization 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.

### 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%.

### Statistical analysis:

The collected data were analyzed by using IBM SPSS (The Statistical Package for Social ~~Sciences)Version~~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 but application~~and applying~~ 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 ~~participation~~ was completely voluntary and no ~~not asked any~~ questions about their identity was asked.

### Inclusion criteria :

The study included~~s~~ all workers who had ~~were~~ worked for one year or ~~and~~ more.

### Exclusion criteria:

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

## Results

AThe total number of 23 questionnaires were distributed and overall response rate of (N=23)100% was achieved. From 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 halfof 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.

**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 |

The prevalence of LBP related to performing duty was 20 out of ~~23~~ 23 (87%) health care workers at this unit ~~(87%)~~ 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~~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~~% suffered from pain of the leg/ buttock.

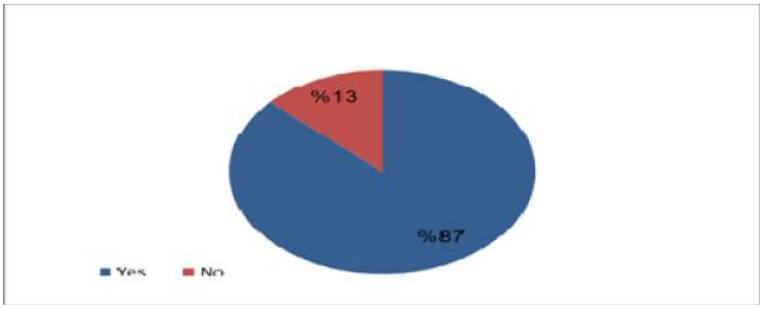
**Table 2: Prevalence and Severity of LBP**

| 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 | 13 |
| | On duty | 5 | 22 |
| | On to post duty | 7 | 30 |
| | Post duty | 8 | 35 |
| **LBP Description** | Localized LBP | 17 | 85 |
| | LBP with numbness | 1 | 5 |
| | Pain of the leg/ buttock | 2 | 10 |

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~~including gender, age, marital status, work years, smoking, qualification, work hours and work shift with LBP frequency was not significant ~~ce~~. Based on P-values listed on this table, it was cleared that those variables were independent and did not affect one another.

**Table 3: The association of LBP Prevalence and Socio-demographic Characteristics**

| Characteristics | Category | LBP | | | 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 | - | |
| **Experience Years** | 0-5 | 2 | 3 | 4 | 0.724 |
| | 6-10 | 1 | 1 | 1 | |
| | 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 | |
| **Smoking** | Never | 4 | 7 | 6 | 0.077 |
| | Current | 3 | - | - | |
| | Previous | - | 3 | - | |
| **Exercise** | None | 5 | 6 | 5 | 0.247 |
| | everyday | 2 | 2 | - | |
| | weekly | - | - | 2 | |
| | monthly | - | - | 1 | |




**Graph (1): The Frequency of LBP (Prevalence of LBP)**

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

**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(~~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 with restriction of activity and movement due to LBP. On the other hand, all of the study subjects did not modify their job as result of LBP. But only 17 % were thinking of leave 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.

**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** | | |

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~~ed~~ that that the two studied 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** | 1 | 4 | 3 | 0.065 | 5.45 |
| **No** | 7 | 3 | 5 | | |
| **Total** | **8** | **7** | **8** | | |

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

**Table 7: The association of Working hours and LBP Frequency.**

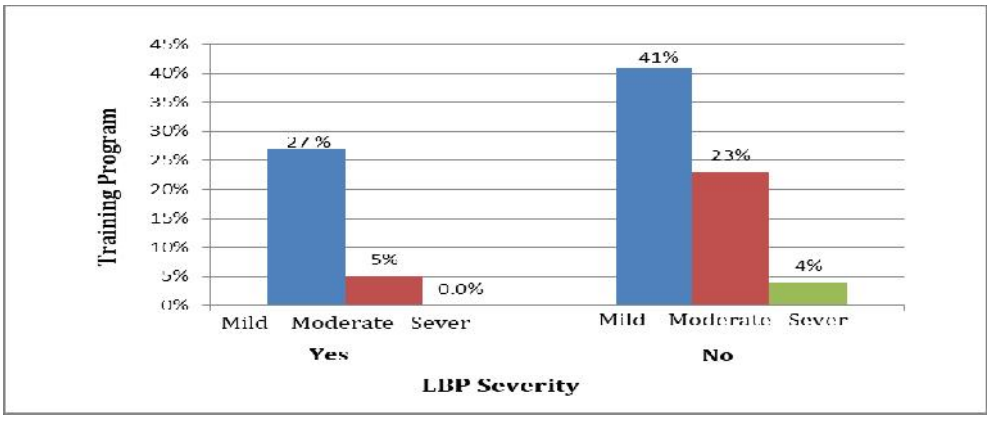
| Working hours | | LBP Frequency | | | P-Value < 0.05 | Chi-Sq. |
|---|---|---|---|---|---|---|
| | | All the time | Once/twice a week | Once/twice a month | | |
| | **6 hours** | 5 | 2 | 4 | 0.394 | 4.093 |
| | **12 hours** | 2 | 5 | 2 | | |
| | **24 hours** | 0 | 2 | 1 | | |
| **Total** | | **7**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

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

**Table 8: The association of Lifting objects/patients and LBP Frequency**

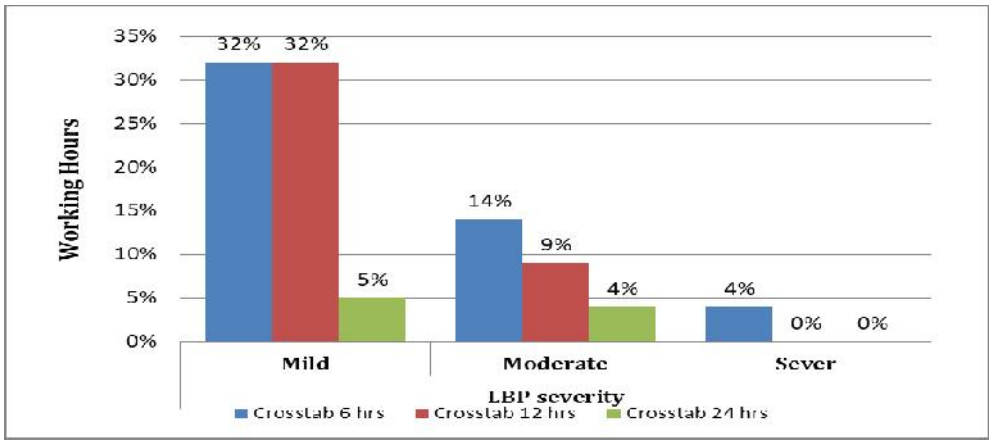
| Lifting Objects/Patients | LBP Frequency | | | P-Value < 0.05 | Chi-Sq. |
|---|---|---|---|---|---|
| | All the time | Once/twice a week | Once/twice a month | | |
| **Yes** | 7 | 2 | 6 | 0.008 | 9.775 |
| **No** | 0 | 6 | 2 | | |
| **Total** | **7** | **8** | **8** | | |

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.



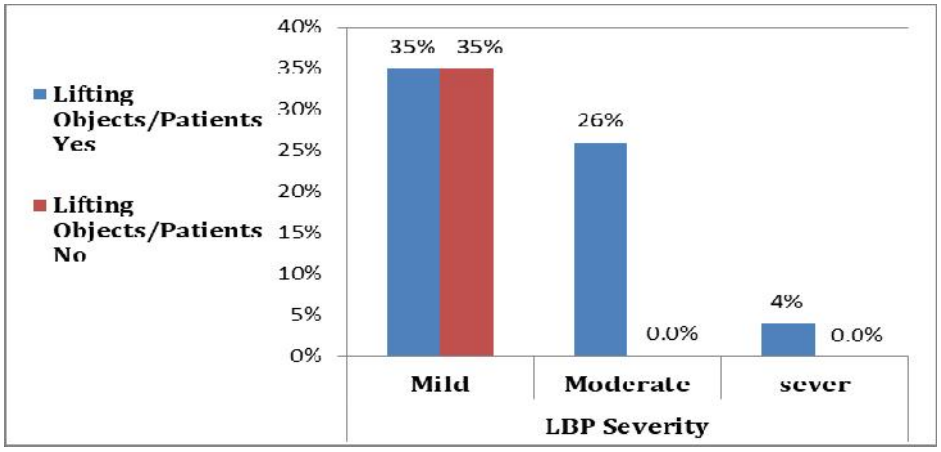

**Graph (2): The association of Training program and LBP Severity**

In ~~the~~ Graph (2), the HCWs in the operating room did not conduct~~ed~~ 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.




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

Additionally, ~~the~~ Graph (3) 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 (4): The association of Lifting Objects/Patients and LBP Severity**

The majority of the HCWs as presented in the Graph (4) 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 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 | 6 | - | - | 0.209 | 5.87 |
| | Nurse | 4 | 11 | 1 | | |
| | Technician | - | 1 | - | | |
| Gender | Male | 4 | 3 | - | 0.418 | 1.75 |
| | Female | 12 | 3 | 1 | | |
| Age | 21-30 | 7 | 3 | - | 0.001 | 23.4 |
| | 31-40 | 8 | 3 | - | | |
| | 41-50 | - | - | 1 | | |
| | >60 | - | - | 1 | | |
| Experience | 0-5 | 7 | 2 | - | 0.565 | 8.65 |
| | 6-10 | 2 | 1 | - | | |
| | 11-15 | - | 1 | - | | |
| | 16-20 | 1 | 2 | 4 | | |
| | 21-25 | - | 1 | - | | |
| | >26 | 1 | - | - | | |
| Qualifications | Diploma | 6 | 5 | - | 0.270 | 5.17 |
| | BSc | 8 | 1 | 1 | | |
| | PhD | 2 | - | - | | |
| Marital Status | Single | 10 | 1 | - | 0.314 | 2.31 |
| | Married | 9 | 2 | 1 | | |
| Work Shift | Day shift | 7 | 4 | 1 | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Rotatory | 7 | 4 | - | 0.619 | 0.958 |
| **Smoking** | Never | 9 | 3 | 5 | 0.061 | 9 |
| | Current | - | 3 | - | | |
| | Previous | 3 | - | - | | |
| **Exercise** | None | 11 | 5 | 1 | 0.842 | 2.72 |
| | Daily | 2 | 1 | - | | |
| | Weekly | 2 | - | - | | |
| | Monthly | 1 | - | - | | |

## 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 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 a ~~clear association~~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.[8][15] Also, a study among the HCWs of hospital in Bangladesh, ~~where~~ found a positive association between age with chronic LBP.[14] Although there was no association of LBP and smoking severity of pain, and also no association between smoking frequency and LBP complains. Previous studies displayed that individual factors including smoking can threaten them to progress ~~LBP.(~~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~~lifting ~~is~~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 ~~the~~ a significant association between LBP occurrence and occupation. More than half were nurses, so this can explain the reason of this ~~association because~~association because of the duty of nurses in surgical unit so the job ha~~d~~ds exposed them to this problem. Without doubt, many studies mentioned that the HCWs were the highest LBP ~~complaints.(~~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.(~~exercise. [12] Given an impression on the lifestyle of Libyans that it

is relatively free of the culture of exercise.

**Conclusion**

The health care workers experience a higher prevalence of lower back pain (LBP) ~~complaints due~~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~~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.

**Recommendations**

- The prevalence of the problem is significantly high. Therefore, a proper no ~~weight 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 organized for the health care workers on regular basis.

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