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# Analysis of Low Back Pain in Nurses with High Work Load: A Cross-Sectional Survey

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## ABSTRACT

**Introduction:** Low back pain is a common, recurrent and costly health problem worldwide. Nurses, particularly, are at higher risk than other health professionals to suffer from injuries and work related musculoskeletal disorders such as low back pain (LBP). Nurses injure their backs from the physical burden associated with manual handling of patients.
**Aim:** The purpose of the study was to investigate the current working conditions of nurses with LBP in relation to their physical workload, and to depiction whether working prolonged shifts is associated with LBP.
**Method:** Total 40 nurses with low back pain with high work load were included in the study. PSEQ was used to assess pain, ODI was used to assess disability, PSFS was used to assess functional activity. Data was analysed by using Pearson test.
**Result:** Nurses were found to be having pain on self-efficacy for pain. On average their self-efficacy for pain was found to be moderate that is 38.78 with maximum score of 60. On average categorised themselves to have moderate disability with 27.83%. On average nurses were having moderate functioning affection with a mean total score of 6.1 when 3 major activities were considered. PSFS was found to be strongly correlated with PSEQ & moderately negative correlated with ODI and ODI was found to be moderately negatively correlated with pain and function scales.
**Conclusion:** The nurses with existing low back pain with high work load has considerable self-efficacy for pain and their physical function and participation were moderately affected.

***Keywords:*** Low back pain, oswestry disability index, Nurses

## INTRODUCTION

Low back pain is a common, recurrent and costly health problem worldwide. Nurses, particularly, are at higher risk than other health professionals to suffer from injuries and work related musculoskeletal disorders such as low back pain (LBP)[2] [3] Musculoskeletal diseases remain the main cause of injury among hospital work forces, whereas LBP has been the major reason of absence in nursing staff.[1][4]
The risk factors of Low back pain in nurses are usually multifactor and it can be categorized as individual and occupational risk factors.

Nurses are the main hospital staff in frequent close contacts with patients. The nurses who work for protection, evolution and improvement of health in cases of health problems for individuals and families spend more time with the patients when compared with other health professional workers and provide direct care for the patients. [10] They injure their backs from the physical burden associated with manual handling of patients. Continue and repeated patient lifting and transferring combined with physical

restrictions owing to poor ergonomics of hospital equipment leads to physiological stress for nurses. [5][6][7] Long working hours, a large number of cared patients, in addition to the frequent manual lifting and improper postures, are all critical factors associated with LBP in nurses, implying that LBP is an occupational disease of complex origins. [2]

Although LBP is not a life threatening disorder, it occurs relatively readily and requires long-term treatment for low back pain. It also exerts financial effect on nursing practice, insurance costs, and occupational compensation. Therefore, it is very important to continually investigate factors associated with LBP in nurses, which has become one of the most critical healthcare issues for hospital staff with high patient-care workload.[8] LBP can be prevented completely if the necessary precautions are taken. Taking precautions for risk factors of LBPs in nurses is important to exercise their fundamental rights and provide better support for patients. [11]

The purpose of the study was to investigate the current working conditions of nurses with LBP in relation to their physical workload, and to depiction whether working prolonged shifts is associated with LBP.

## MATERIALS & METHODS

This study is a cross-sectional survey. Human Services definition of LBP - it is considered as chronic and/or acute pain experienced in the regions of lumbosacral, buttock, or upper leg. [9] Present study focuses on the nonspecific type of LBP in this study. After taking ethical approval from the institutional ethical committee of Apollo institute of physiotherapy, an explanation of the procedure and written consent was taken from the participants.

The inclusion criteria were set as 1) nurses who is working since last 3 years, 2) who are willing to participate, 3) Minimum 9 hours daily duty, 4) not undergone in any surgery from last 6 months 5) average daily hours of standing, sitting and walking at work, average daily hours at work, weekly frequency of exercise for >30 minutes.

The exclusion criteria were set as 1) less than 3 year experience, 2) less than 8 hours duty, 3) History of selected diseases that can be associated with pain in the low back area (i.e., herniated intervertebral disk, degenerate arthritis of lumbar spine palsy, spondylolisthesis, sciatic nerve pain, scoliosis, osteoporosis, etc.)

A total of 40 registered nurses working at various hospital in the Ahmedabad of were invited to participate in the study. This study assesses the low back pain in nurses with high work load. Pain self-efficacy questionnaire was used to assess pain, Oswestry disability index was used to assess disability, patient-specific functional scale was used to assess functional activity. After that all the outcome measures were explained to the participants. Survey which they were asked to complete the Pain self-efficacy questionnaire, Oswestry disability index, Patient specific functional scale.

## STATISTICAL ANALYSIS

Data was taken used outcome measures defined above and analysis was done. Statistical analysis was done using SPSS 26 version. With informed consents, 40 participants completed valid questionnaires. This study has been reviewed and approved by the Apollo Institute of Physiotherapy.

## RESULT

From total sample size, 40 nurses were found to be having pain on self-efficacy for pain. On average their self-efficacy for pain was found to be moderate that is 38.78 with maximum score of 60. On average categorized themselves to have moderate disability with 27.83%. On average nurses were having moderate functioning affection with a mean total score of 6.1 when 3 major activities (sitting, forward bending, heavy weight lifting) were considered.

PSFS was found to be strongly correlated with PSEQ with value of 0.758 & moderately negative correlated with ODI (r = -0.550). And ODI was found to be moderately negatively correlated with pain and function scales (r = -0.585, r = -0.550).

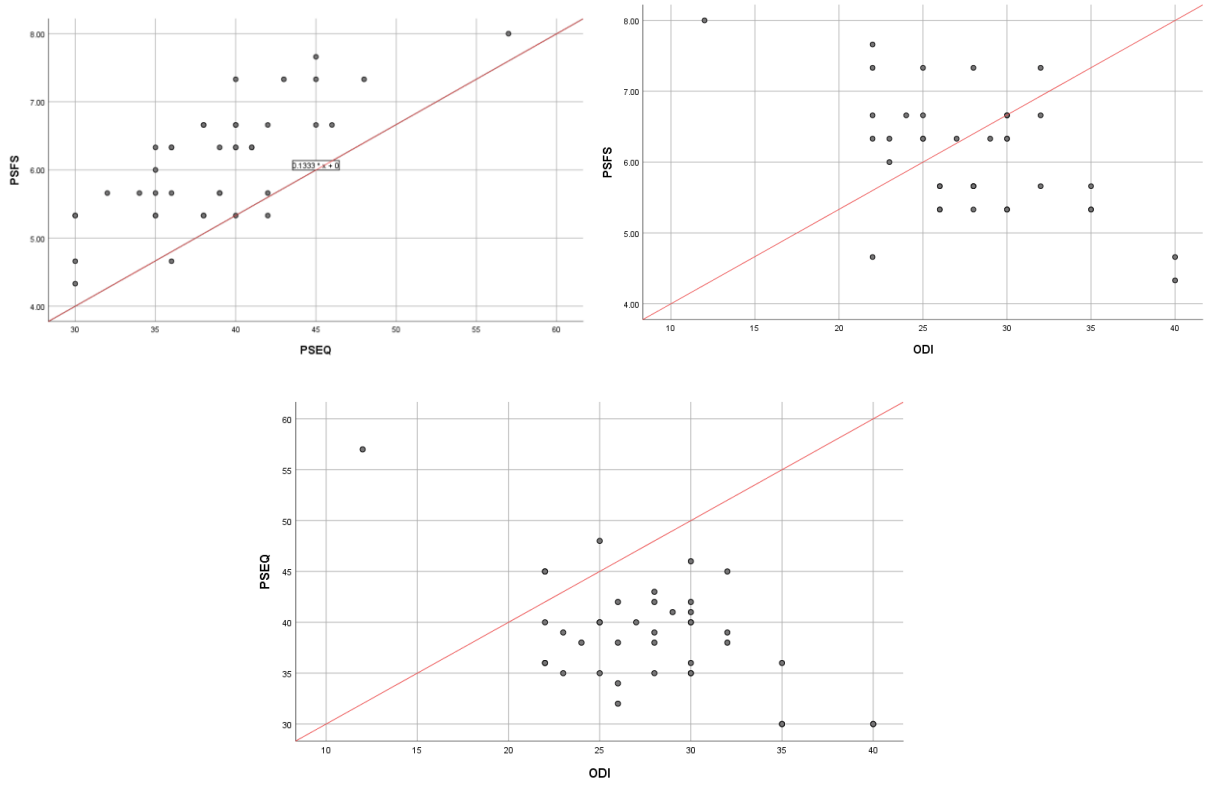
**Table – 1 (base line data)**

| | | Number of participants |
|---|---|---|
| Age | 21-25 | 27.53 |
| | 26-30 | 23 |
| | Total | 50.53 |
| Gender | Female | 31 |
| | Male | 9 |
| | Total | 40 |

**Table – 2 (correlation between scales)**

| | PSFS | PSEQ | ODI | p-value |
|---|---|---|---|---|
| PSFS | 1 | 0.758** | -0.550** | 0.00 |
| PSEQ | 0.758** | 1 | -0.585** | 0.00 |
| ODI | -0.550** | -0.585** | 1 | 0.00 |

**correlation is significant at the 0.01 level (2-tailed)
PSFS: Patient-specific functional scale
PSEQ: Pain Self-Efficacy Questionnaire
ODI: Oswestry disability index




**(Graph: scatter plot of PSFS &PSEQ, PSFS & ODI, PSEQ & ODI)**

## DISCUSSION

Nurses are the major work force in a health care system, they play an important role in improving patient's health.[14] Nurses should provide importance for their own health also, so that the nursing care which they are providing will be of good quality.[15] Low back pain being one of the serious health problem is affecting nurses to give quality care for patients, so this study is conducted to know the prevalence of low back pain among nurses and the factors which are contributing for the same. There are only few studies conducted in the same field in our country for reference and knowing the risk factors that causes low back pain among nurses will help the hospital administration to take prompt action and help in minimising the risk.[15]

The main occupational risk factors associated with LBA among nurses are standing for long duration, Lifting and moving patients, Frequent twisting and bending, sustained posture, Job design, Anxiety, Depression, Stress, Low social support at work, Poor job satisfaction, Shortage of staff and poor working conditions.[12,13]

The nature of work has a high influence for the prevalence of LBP among nurses. Nurses working in areas requiring strenuous physical activity especially in ICU are more prone for LBP. Improper postural mechanics also has a direct effect on the prevalence of LBP. Patient lifting poses a high risk to nurses in a hospital

environment.[16] Especially in the developing countries like India the lack of lifting aids forces the nurses to strain during shifting of patients. It is reported that poor knowledge of back care ergonomics and unavailability of lifting equipment are major predisposing factors to LBP among nurses.[17] Overweight and obesity also seem to worsen the situation further.[18]

Total 40 registered nurses were participated in this study. Pain was assessed by PSEQ. Functional activity was assessed by PSFS. Disability was assessed by ODI. The result shows that PSFS was found to be strongly correlated with PSEQ and moderately negative correlated with ODI, because of pain participants have feel difficulty in functional activity like lifting, sitting, sleeping, traveling, caring, walking, standing, social life, and changes in pain intensity. ODI was found to be moderately negatively correlated with pain and function scale as young age, regular physical activity and functioning has yet not affected the disability component related to low back pain.

prevalence of low back pain is high among nurses. Standing for long duration of time, lifting patients, moving of trolly, sitting for long duration in high height chair for file work, and activities that involves bending or twisting are associated with increased prevalence of low back pain. The nurses who are working in areas like Medicine, Orthopaedics and ICU had higher prevalence of low back pain.[29]

Nurses participating in this study were required to work for >9 hours per day on average, which is relatively longer for the LBP.[8] With regards to the number of years of working as nurses, those with 2 to 5 years in service possess a 2.11 times higher risk of LBP than those with < 2 years in service.[8]

Repetitive spine movements, improper working posture and excessive use of force for lifting are the three major factors that lead to musculoskeletal problems and LBA (Buker et al., 2006) [19], All these factors lead to excessive use of tendons, ligaments and muscles, static muscle loading and fatigue, which increase the likelihood of low back pain. Performing duties related to carrying the patient or shifting the patient without getting support or any supportive equipment may also result in LBP (Buker et al., 2006; Yilmaz, Sahin & Kuran et al. 2006). [19,20]

The previous study results suggest that longer daily working hours and a large number of cared patients per shift should be discouraged in order to prevent musculoskeletal problems such as LBP in registered nurses (Shwn-Huey Shieh a, et al. 2016). [8] The previous study shows significant correlations between the likelihood of getting LBP and hours of physical load such as working, standing, and walking (Trinkoff AM, et al. 2006). [7]

Long working hours, excessive work load, inadequate breaks, standing up for long periods of time, working in wrong posture, disruptions of sleeping cycle and eating habits due to shifts are among the occupational risk factors that may result in LBP for nurses (Ovayolu et al., 2014; Pinar, 2010; Selvi et al., 2010). [21,22,23]

Type of ward that nurses work in can contribute to high low back pain rates. In our study we found that Nurses working in medicine, orthopaedics and intensive care units had more low back pain as compared to nurses in other wards. The reasons for this may be nurses in these wards are caring for people that are normally bedridden and helpless and require more assistance with transfers and handling. [24, 25, 26]

Shift of duties contribute to LBA. Maximum number of nurses has LBA in overtime duties and night shift. The correlation between the shift of duty and low back pain has been established in some studies.[26, 27]

Working at night leads to sleep deprivation which can result in muscle strain. There are usually fewer nurses at night for duties and it is one of the cause for LBA at night as they required to do heavy patient transfers with minimal assistance at the night.[26, 27]

Regular training for the staff for lifting the patient and then transferring them, Physical and mental exercise programs, Learning the art of relaxation, Use of mechanical devices for shifting the patient, regular change in the ward, Improved working conditions, good life

style practices and healthy food habits will help in preventing low back pain.[28]

## CONCLUSION

The nurses with existing low back pain with high work load has considerable self-efficacy for pain and their physical function and participation were moderately affected. The nurses with high work load were having considerable self-efficacy for pain. When the pain increases disability increases & physical function was reduced.

### Limitation And Future Recommendations

Sample Size for this study was small. We have taken only 3 parameters. Future research may have relatively large sample size. It could be done in other population.

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**Conflict of Interest:** The authors declare no conflict of interest

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**Ethical Approval:** This study has been reviewed and approved by the Apollo Institute of Physiotherapy

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