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# Correlation between nursing supervision and low back pain preventive behavior among nursing staff in hospital☆

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**Abstract**
*Objective:* To identify the correlation between nursing supervision and low back pain (LBP) preventive behavior among nursing staff at the hospital.
*Method:* Quantitative research using cross-sectional design. The respondents were 141 nursing staff members working at inpatient care facilities and outpatient care units of the non-psychiatric departments of Marzoeki Mahdi Hospital. Samples were taken using total sampling. The instruments used in this research were nursing supervision questionnaires and LBP preventive behavior instruments.
*Result:* A Chi-square test with an ($\alpha \leq 0.050$) level of significance indicates that there is a significant correlation between nursing supervision and LBP preventive behavior among nursing staff at the hospital ($p = 0.015$); OR = 2.440. Bivariate analysis shows that there is no significant correlation between respondents' characteristics (sex, age, body mass index (BMI), and self-efficacy) and LBP preventive behavior.
*Conclusion:* The results of this research may serve as a recommendation for more intensive LBP preventive behavior among nursing staff through rigorous nursing supervision.


## Introduction

Low back pain (LBP) is a musculoskeletal disorder that occurs most commonly among nurses. The incidence of LBP is 48.8% in the U.S.[1] and 41–75% in European countries.[2] LBP's prevalence among nurses in Asia is slightly higher, especially for the developing countries in the continent, reaching 70%.[3]

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The incidence of LBP among nursing staff in developing countries is high because nurses are engaged in physical work, such as lifting and moving the patients. At Marzoeki Mahdi Hospital, the incidence of LBP among nursing staff is 21%. There are problems to providing nursing care for the patient.

Risk factors for LBP in nurses include sex, age, and body mass index (BMI).[4] Previous research in Iran found that the prevalence of LBP is higher in women than in men.[5] Middle-aged nurses whose BMI falls into the overweight category are also more prone to LBP. A study at a hospital in Taiwan proved that 43.7% of nurses affected by LBP are 25–29 years old.[3] Other studies show that the nurses affected by LBP are mostly those who are categorized as obese.[6]

Another intrinsic factor of LBP among nurses is self-efficacy, or confidence, which determines the way a person acts and behaves. A person who has no confidence in achieving his or her desired goals or preventing something from happening through actions usually lacks the motivation to do said actions[7]; therefore, a nurse who is unconfident about his or her ability to do his or her job will not perform at a desired level.[8] Self-efficacy may prevent nurses from suffering LBP when doing their jobs.

LBP among nurses may be avoided through systems and individual approaches. Prevention of LBP through individual approaches includes improving posture, proper methods of lifting and moving patients, and muscle exercises.[9] LBP can also be prevented through systems such as nursing supervision and training, which are the two variables that ensure nurses' safety.[10] Nursing supervision was consistently conducted by the unit manager (*Karu*) and team leader (*Katim*) during a nurse coaching program, from which all the unit staff have already reaped the benefits.

This research aims to identify the nurses' characteristics, LBP prevention behavior, and nursing supervision, as well as study the correlation between the nurses' characteristics and LBP preventive behavior and the relationship between nursing supervision and LBP preventive behavior among the hospital nursing staff.

## Method

This research uses a descriptive quantitative method with cross-sectional design. Respondents consisted of 141 nursing staff working at inpatient care facilities and outpatient care units of the non-psychiatric departments of Marzoeki Mahdi Hospital, who were selected through the total sampling technique. Data were obtained by distributing questionnaires to identify the characteristics of nurses and explore their perceptions on the nursing supervision programs and LBP prevention. The validity and reliability of the research instruments were tested at Bogor District Hospital (RSUD Kota Bogor) against 30 respondents. The validity test showed a Cronbach's alpha of 0.754 on the nursing supervision questionnaire and a Cronbach's alpha of 0.702 on the LBP prevention questionnaire.

The data-collecting procedures began with an explanation of the research objective to the respondents. Then, the questionnaires were distributed and the respondents were informed of their rights and duties in the research. Respondents who decided to participate in the research were asked to fill in the informed consent form and answer all questions in the questionnaire.

The collected data were then analyzed and processed using a computer program. The data were analyzed using descriptive statistics with frequency and percentage before being subjected to an analysis on their correlation with *Continuity Correction Chi-square*. All data are kept confidential and may be used for research purposes only.

**Table 1** Characteristics of respondents ($n = 141$).

| Variables | Total | Percentage (%) |
|---|---|---|
| *Sex* | | |
| Male | 41 | 29.1 |
| Female | 100 | 70.9 |
| *Age* | | |
| ≤25 years | 11 | 7.8 |
| 26–30 years | 21 | 14.9 |
| 31–40 years | 91 | 64.5 |
| 41–50 years | 18 | 12.8 |
| *BMI* | | |
| Underweight | 11 | 7.8 |
| Normal | 77 | 54.6 |
| Overweight | 40 | 28.4 |
| Obesity | 13 | 9.2 |
| *Self-efficacy* | | |
| Low | 71 | 50.4 |
| High | 70 | 49.6 |

**Table 2** LBP preventive behavior measures among nursing staff and nursing supervision ($n = 141$).

| Variable | Total | Percentage (%) |
|---|---|---|
| *LBP preventive behavior* | | |
| Inadequate | 66 | 46.8 |
| Adequate | 75 | 53.2 |
| *Nursing supervision* | | |
| Inadequate | 69 | 48.9 |
| Adequate | 72 | 51.1 |

## Results

Nurse characteristics were identified through univariate data analysis. Table 1 shows that the nurses were mostly female (70.9%), aged 31–40 years (64.5%), with BMI categorized as (54.6%) and low self-efficacy (50.4%).

Table 2 shows that the nurses perceived the LBP prevention as going well. The LBP preventive behavior measure that the nurses perceived as inadequate was bending down while reaching for an object at a lower position, or while lifting or moving patients.

The number of nurses who had a positive perception toward nursing supervision was the same as those who had a negative perception toward it. Specifically, the supervision item that the nurses perceived as inadequate was the observation program. The nursing supervisors have not conducted a full observation on all nursing staff in LBP prevention.

**Table 3** Correlation between nursing supervision and LBP preventive behavior among nursing staff ($n = 141$).

| Variable | LBP preventive behavior | | | | $p$ | OR |
|---|---|---|---|---|---|---|
| | Inadequate | | Adequate | | | |
| | $n$ | % | $n$ | % | | |
| *Nursing supervision* | | | | | | |
| Inadequate | 40 | 58.0 | 29 | 42.0 | 0.015* | 2.440 |
| Adequate | 26 | 36.1 | 46 | 63.9 | | |
| Total | 66 | 46.8 | 75 | 53.2 | | |

* Significant at $\alpha < 0.05$.

As shown in Table 3, the nursing supervision variable significantly correlates to LBP preventive behavior among nursing staff ($p = 0.015$, $\alpha < 0.05$). The value of odds ratio (OR) is 2.440 (95% CI: 1.239–4.808). Nursing supervision has a 2.44-time chance of adequate LBP preventive behavior among nursing staff.

Table 4 shows the correlation between the characteristics of the respondents (sex, age, BMI, and self-efficacy) and LBP preventive behaviors. The analysis shows that there is no significant correlation between the respondent characteristics and LBP preventive behavior, whereby $p = 0.391$; $p = 0.630$; $p = 0.572$; and $p = 0.075$. Female nurses who were 26–30 years old with a BMI within the obese category and low self-efficacy demonstrated somewhat improper attitudes toward LBP prevention.

## Discussion

More female respondents participated in the research than males. This is due to the increasing number of women interested in nursing education and jobs at hospitals or other health service centers. Men, meanwhile, pursue nursing careers for high wages.[11] Having the same workload as that of their male counterparts, female nurses must work harder to prevent themselves from suffering LBP.

There is no significant correlation between sex and LBP preventive behavior ($p = 0.391$), as both male and female nurses have the same chance of preventing themselves from suffering LBP. The results of this research are in line with a study conducted in Solo, which proved that there is no significant correlation between sex and LBP preventive behavior.[12] However, research conducted in Australia proved that there is a significant correlation between sex and exercises to lower the frequency of LBP-related complaints among nurses.[13]

The respondents are mostly 31–40 years old (64.5%), which is categorized as middle-aged.[14] This is a productive age range, as middle-aged people are determined to change and demonstrate a good attitude toward LBP prevention.[15]

There is no significant correlation between age and LBP preventive behavior of ($p = 0.630$), as nurses from any age group can prevent LBP. A study in Munich also found no significant correlation between age and exercises designed to prevent LBP.[16] Other studies have shown similar findings.[12]

The BMI of the nurses participating in this research is categorized as normal (54.6%). This indicates that the nurses have good health habits by maintaining ideal weight and height, making LBP prevention more effective. Maintaining ideal weight and height is a factor that prevents someone from suffering from LBP.[17]

There is no significant correlation between BMI and LBP preventive behavior ($p = 0.572$), as nurses with any BMI can prevent LBP. Any weight reduction program designed for patients with obesity and weight problems will have positive impacts on LBP prevention.[15] However, previous research in Jakarta did find a significant correlation between BMI and LBP.[18]

There is an almost equal number of respondents with low self-efficacy and high self-efficacy in this research. This is because self-efficacy relates to personal self-management and is affected by level, strength, and generality; it is a medium for knowledge and behavior, and is one of the requirements for behavioral change.[19] Research in Bangkok proved that self-efficacy promotion programs have contributed positively to LBP prevention.[20]

Due to the differing degrees of self-efficacy among respondents depending on their level, strength, and generality, there is no significant correlation between self-efficacy and LBP preventive behavior ($p = 0.075$). However, other studies have found a significant correlation between self-efficacy and self-management in the prevention of LBP.[21]

Most respondents (53.2%) showed positive attitudes toward LBP prevention because nurses have adopted LBP prevention principles in their workplace. Some nurses showed somewhat negative attitudes while providing nursing services. Physical exercises and maintaining proper position while lifting or moving patients are the significant factors in LBP prevention among nurses.[9] Other studies find that multidimensional interventions—such as muscular strength, exercises, relaxation, and education—may effectively prevent LBP among nursing staff.[13] A nurse with busy schedule at the ICU and operating room may be prone to LBP, meaning that more intensive preventive behavior must be taken during room activities.

Nurses should take any preventive behavior against LBP so that they can maintain good health to provide quality nursing services for the patients. A nurse may prevent LBP by taking a series of preventive behaviors. Schaafsma[9] states that LBP prevention management programs fall into two categories: primary prevention and secondary prevention. Primary prevention focuses on the application of ergonomic principles while working,[22] whereas secondary prevention focuses on risk and environmental assessment through nursing supervision, among others.

**Table 4** Correlation between respondents' characteristics and LBP preventive behavior among nursing staff ($n = 141$).

| Characteristics of respondents | LBP preventive behavior | | | | Total | | $p$ |
|---|---|---|---|---|---|---|---|
| | Inadequate | | Adequate | | $n$ | % | |
| | $n$ | % | $n$ | % | | | |
| *Sex* | | | | | | | |
| Male | 22 | 53.7 | 19 | 46.3 | 41 | 100 | 0.391 |
| Female | 44 | 44.0 | 56 | 56.0 | 100 | 100 | |
| *Age* | | | | | | | |
| <25 years | 6 | 54.5 | 5 | 45.5 | 11 | 100 | 0.630 |
| 26–30 years | 12 | 57.1 | 9 | 42.9 | 21 | 100 | |
| 31–40 years | 41 | 45.1 | 50 | 54.9 | 91 | 100 | |
| 41–50 years | 7 | 38.9 | 11 | 61.1 | 18 | 100 | |
| *BMI* | | | | | | | |
| Underweight | 3 | 27.3 | 8 | 72.7 | 11 | 100 | 0.572 |
| Normal | 37 | 48.1 | 40 | 51.9 | 77 | 100 | |
| Overweight | 19 | 47.5 | 21 | 52.5 | 40 | 100 | |
| Obesity | 7 | 53.8 | 6 | 46.2 | 13 | 100 | |
| *Self-efficacy* | | | | | | | |
| Low | 39 | 54.9 | 32 | 45.1 | 71 | 100 | 0.075 |
| High | 27 | 38.6 | 43 | 61.4 | 70 | 100 | |

Most respondents (51.1%) thought that the nursing supervision had been properly conducted. They admitted that they had gone through counseling, observation, guidance, motivation, and evaluation from *Karu* and *Katim*. A nurse manager who conducts supervision must be competent and have proper knowledge on his or her unit so that he or she can upgrade the nurses' professionalism.[23] Good supervisors direct the nurses instead of telling them what to do.[24] According to the respondents, the supervision item that needs improvement is the observation program. LBP prevention among the nursing staff has not been properly observed because the supervisors frequently skip the supervision of nursing activities in each of the nursing shifts (morning, afternoon, and night).

There is significant correlation between nursing supervision and LBP prevention among the nursing staff ($p = 0.015$). This is because the proper supervision programs conducted by *Karu* and *Katim* have contributed positively to LBP prevention among nursing staff. The findings of this research are the same as those of a study conducted in Jakarta, which proved that there is a significant correlation between nursing supervision and behaviors of nursing staff in the prevention of LBP.[10] Other studies also found that supervision is a significant factor that leads to behavioral change.[24] However, some studies suggest that there is no significant correlation between leadership and nurses' behaviors in maintaining safety.[10]

Nursing supervision is conducted to ensure that the room activities are in accordance with the vision, mission, and goals of the room. The supervision programs must benefit both the nursing services and the staff. Nursing supervision for staff will broaden their knowledge, sharpen their skills, and change their attitude.[25]

Nursing supervision generally falls into four categories: formative, administrative, normative, and restorative.[24] Additionally, formative nursing supervision is divided into three sub-categories: behavioral change, growth and development, and reflection or decision making of a particular issue. With nursing supervision, *Karu* and *Katim* can provide the nurses with guidance, observations, motivation, and evaluation in the prevention of LBP.[10]

The nursing supervision is not only an administrative daily routine, but also focuses on changing the behaviors of nurses for the better to promote nursing services.[24] Marzoeki Mahdi Hospital has regularly conducted nursing supervision and made it a component of *Karu* and *Katim*'s performance appraisal. Observation has not been implemented as a nursing supervision component, while implementation is an LBP prevention component that has not taken place.

The hospital management can use the results of this research as guidelines for establishing a manual for LBP prevention to be used by the nursing staff. The hospital management should also intensify the nursing supervision, especially the observation of nurses on duty. This research may also serve as an input for the nursing staff to find better approaches in LBP prevention, such as maintaining proper position while lifting or moving patients, attending work safety training, and exercising to maintain muscle strength.

## Conflict of interests

The authors declare no conflict of interest.

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