Conference Paper

The Factors Correlating to Low Back Pain in Nurses at Annisa Hospital Pekanbaru

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Abstract

The disease that generally occurs on the labors is low back pain. Low back pain is a condition of acute pain or chronic and inconvenience aroud lumbosacral, caused by inflammation, degenerative, malignancy, and gynecology disorder, trauma, or metabolism disorder. The purpose of this research is to know the correlation between work posture, IMT, work period, work length, work shift, age and the occurance of low back pain on the nurses at Annisa Hospital. The type of this research is quantitative research with cross sectional approach. The population in this research were all nurses at Annisa Hospital Pekanbaru in total 126 nurses by using Total Sampling technique. The research instruments used were questionnaire, scales, height gauge, RULA, and observation sheet. The data were obtained through questionnaires. The analysis was by using chi-square test with $\alpha = 0.05$ and logistic binary test. The research results show that the variables having significant correlation are work posture, IMT, and age. The results of this research can used to decrease the occurance of low back pain in nurses at the hospital. The conclusion of this research is the factors which have correlation to the complain on low back pain in the nurses at Annisa Hospital are work posutre, IMT, and age. It is expected that nurses perform work attitude correctly and do exercise 3 to 5 times in a week for $\geq$ 30 minutes, and achieve ideal body weight.

Keywords: Low back pain occurance, work posture, IMT, and Age.

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1. Introduction

The disease that generally occurs on the workers is low back pain. Low back pain is a condition of acute pain occurance or chronic and inconvenience around lumboscral, which is caused by inflammation, degenerative, malignancy, and gynecology disorder, trauma or metabolism disorder. The risk factor which causes low back pain is using too much energy when doing manual handling, doing clumsy posture, and experiencing vibration or shaking in the whole body [1].

The nurses are one of human resources at the hospital who have sufficiently big number and have extremely important factors in determining the service quality at a hospital. Nurses in doing the care to the patients have various tasks, such as doing independent

treatment such as fulfilling Activity Daily Living (ADL) of the patients, bathing the patients in the bed, taking care of the wounds, and so on. Beside the independent treatment, the nurses also have collaborative task such as giving the medicines through injection, put on a catheter, and so on.

The nurses in doing their job mostly use bending movement and twisting the body, especially around the lower backbone, lifting heavy objects, and transfering patients are the biggest risk factors of suffering from low back pain [2].

Annisa Hospital Pekanbaru is a private hospital in Pekanbaru. Based on the data from the medical record in 2015-2016, there were 29 people (58.7%) out of 126 nurses complained the pain on the low backbone at Annisa Hospital Pekanbaru. Based on the preliminary survey conducted on the nurses at Annisa Hospital Pekanbaru with total 10 respondents, it was known that 7 respondents admitted that they experienced low back pain occurance and 3 respondents do not experience low back pain occurance. Therefore the researcher is interested in conducting the research entitled; "The Factors Correlating to Low Back Pain Occurance on The Nurses at Annisa Hospital Pekanbaru in 2017.

2. Method and Instruments

2.1. Method

The type of this research is quantitative research with cross sectional study design. The location of this research was conducted at Annisa Hospital Pekanbaru. The number of respondents in this research were 126 people. The samples were taken by using total sampling technique in which all nurses were taken as samples.

2.2. Instruments

The instruments used in this research were questionnaires about low back pain, work posture, IMT, work period, work length, work shift, and age. Through the questionnaires, the respondents answered questions and there would be score from the researcher. The questions used in the questionnaires were in the form of closed question or in the form of multiple choices. The questionnaires had been tested both its validity and reliability.

3. Results

3.1. Univariate analysis

Univariate analysis explains or describes the respondents' characteristics and frequency of each variable which is examined through the table of frequency distribution as follows.

Table 1: The Respondents Distribution Based on The Occurance of Low Back Pain on Nurses at Annisa Hospital Pekanbaru.

The Occurance of Low back pain	Total	Percentage (%)
Low Back Pain	76	60,3
Not Low Back Pain	50	39,7
Total	126	100.0

Based on the table above, it can be known that out of 126 nurses at Annisa Hospital Pekanbaru, 76 nurses (60.3%) experience low back pain occurance, meanwhile 50 nurses (39.7%) do not experience low back pain occurance.

Table 2: The Respondents' Distribution Based on The Work Posture of The Nurses at Annisa Hospital Pekanbaru.

Work Poture	Total	Percentage (%)
Risky	77	61,1
Not Risky	49	39,8
Total	126	100.0

Based on the table, it can be known that out of 126 nurses at Annisa Hospital Pekanbaru, 77 nurses (61.1%) have more risky work postures and, while 49 nurses (38.9%) do not have risky work postures.

Table 3: The Respondents' Distribution Based on Body Mass Index (IMT) of The Nurses at Annisa Hospital Pekanbaru.

IMT	Total	Percentage (%)
Risky (≥25,0)	72	57,1
Not Risky (<25,0)	54	42,9
Total	126	100.0

Based on the table above, it can be known that out of 126 nurses at Annisa Hospital Pekanbaru, 72 nurses (57.1%) are risky.

Table 4: Repondents' Distribution Based on Nurses' Work Period at Annisa Hospital Pekanbaru.

Work Period	Total	Percentage (%)
Risky	79	62,7
Not Risky	47	37,3
Total	126	100.0

Based on the table above, it can seen that out of 126 nurses at Annisa Hospital Pekanbaru, 79 nurses (62.7%) have more risky work period, meanwhile 47 nurses (37.3%) do not have risky work period.

Table 5: Respondents' Distribution Based on Nurses' Work Length Per Day at Annisa Hospital Pekanbaru.

Work Length Per Day	Total	Percentage (%)
Risky	85	67,5
Not Risky	41	32,5
Total	126	100.0

Based on the table above, it can be known that out of 126 nurses at Annisa Hospital Pekanbaru, 85 nurses (67.5%) have risky work length, while 41 nurses (32.5%) do not have risky work length.

Table 6: Respondents' Distribution Based on Nurses' Work Shift at Annisa Hospital Pekanbaru.

Work Shift	Total	Percentage (%)
Yes	91	**72,2**
No	35	**27,8**
Total	126	100.0

Based on the table above, it can be known that out of 126 nurses at Annisa Hospital Pekanbaru, 91 nurses (72.2%) work with work shift, while 35 nurses (27.8%) do not work with work shift.

Table 7: Respondents' Distribution Based on Age of Nurses at Annisa Hospital Pekanbaru.

Age	Total	Percentage (%)
Risky	75	**59,5**
Not Risky	51	**40,5**
Total	126	100.0

Based on the table above, it can be known that out of 126 nurses at Annisa Hospital Pekanbaru, 75 nurses (59.5%) work with risky age, while 40 nurses (40.5%) work with not risky age with work shift. From six independent variables above, there is no variable with percentage <15%.

3.2. Bivariate analysis

Bivariate analysis is the analysis used to know the correlation between independent variable and dependent variable, also to see whether it is meaningful or not among those variables with chi-square test. Data processing was done by using computerization program with standard of error used was 0.05 (5%) and p value < α score, then there

is significant correlation between independent variable and dependent variable. In the contrary, if p value > α, it means there is not significant correlation between independent variable and dependent variable.

3.2.1. The Correlation Between Work Posture and Low Back Pain Occurance

TABLE 8: The Correlation Between Work Posture and Low Back Pain occurance on Nurses at Annisa Hospital Pekanbaru.

Work Posture	Low Back Pain Occurance						P value	POR 95% CI
	Low Back Pain		Not Low Back Pain		Total			
	N	%	N	%	N	%		
Risky	68	89,5	8	10,5	76	100	0,001	38 (13,849-108,269)
Not Risky	9	18	41	82	50	100		
Total	77	61,1	49	38,9	126	100		

Based on the table above, it can be seen the result of the correlation between work posture and low back pain occurance as follows; the respondents who have risky work posture and experiencing low back pain occurance are 68 nurses (89.5%), compared to respondents who do not have risky work posture and experiencing the occurance of low back pain in the amount of 9 nurses (18%).

The result of the statistical test by using chi square test, obtained p value = 0.001 which means the value of p<0.05 then hypothesis nol (Ho) is rejected. Therefore, it can be concluded that there is significant correlation between work posture and the occurance of low back pain. The score of POR = 38 which means the nurses with risky work posture will have risk 38 times higher than the nurses who do not have risky work posture in experiencing low back pain occurance.

3.2.2. The Correlation Between IMT and Low Back Pain Occurance

Based on the table above, it can be seen the result of correlation between IMT and the occurance of low back pain is that the respondents who experience low back pain occurance and have risky IMT are 65 nurses (85.5%), compared to respondents who experience low back pain occurance and have not risky IMT in the amount of 7 nurses (14%). The result of statistical test by using cross sectional test obtained P value = 0.001

Table 9: The Correlation between IMT and The Occurance of Low Back Pain on Nurses at Annisa Hospital Pekanbaru.

IMT	Low Back Pain Occurance						P value	POR 95% CI
	Low Back Pain		Not Low Back Pain		Total			
	N	%	N	%	N	%		
Risky	65	85,5	11	14,5	76	100	0,001	36 (13,050-100,961)
Not Risky	7	14	43	86	50	100		
Total	71	57,1	54	42,9	126	100		

which means P<0.05 then null hypothesis (Ho) is rejected. Therefore it can be concluded that there is significant correlation between IMT towards low back pain occurance.

3.2.3. The Correlation Between Work Period and Low Back Pain Occurance

Table 10: The Correlation Between Work Period and Low Back Pain Occurance on Nurses at Annisa Hospital Pekanbaru.

Work Period	Low back pain Occurance						P value	POR 95% CI
	Low Back Pain		Not Low Back Pain		Total			
	N	%	N	%	N	%		
Risky	65	85,5	11	14,5	76	100	0,001	15 (6,249-36,946)
Not Risky	14	28	36	72	50	100		
Total	79	62,7	47	37,7	126	100		

Based on the table above, it can be seen the result of correlation between work period and low back pain occurance is that respondents who experience low back pain occurance and risky work period in the amount of 65 nurses (85.5%) compared to the respondents who experience low back pain occurance and not risky work period in the amount of 14 nurses (28%).

The result of statistical test by using chi square test obtained the score of P value = 0.001 which means P<0.05, then null hypothesis is rejected. Therefore it can be concluded that there is significant correlation between work period and low back pain occurance. The score of POR = 15 which means the nurses with risky work period have a chance experiencing low back pain occurance 15 times higher than those with not risky work period.

3.2.4. The Correlation Between Work Length and Low Back Pain Occurance

Table 11: The Correlation Between Work Length and Low Back Pain Occurance in Nurses at Annisa Hospital Pekanbaru.

Work Length	Low back pain Occurance						P value	POR 95% CI
	Low Back Pain		Not Low Back Pain		Total			
	N	%	N	%	N	%		
Risky	66	86,6	10	13,2	76	100	0,001	10 (4,482-25,874)
Not Risky	19	38	31	62	50	100		
Total	85	67,5	41	32,5	126	100		

Based on the table above, it can be seen the result of the correlation between work length and low back pain occurance is that the respondents who experience low back pain occurance and risky work length are 66 people (86.6%). The respodents who experience low back pain occurance and not risky work length are 19 people (38%).

The result of statistical test through chi square test obtained the score of P value = 0.001 which means P<0.05, then null hypothesis (Ho) is rejected. Therefore it can be concluded that there is significant correlation between work length and low back pain occurance. The score of POR = 15 which means the nurses with risky work length have a chance of experiencing low back pain occurance 15 times higher than those with not risky work length.

3.2.5. The Correlation Between Work Shift and Low Back Pain Occurance

Table 12: The Correlation Between Work Shift and Low Back Pain Occurance in Nurses at Annisa Hospital.

Work Shift	Low back pain Occurance						P value	POR 95% CI
	Low Back Pain		Not Low Back Pain		Total			
	N	%	N	%	N	%		
Yes	67	88,2	9	11,8	76	100	0,001	8 (3,312-19,637)
No	24	48	52	52	50	100		
Total	91	72,2	35	27,8	126	100		

Based on the table above, it can be know the result of the correlation between work shift and low back pain occurance is that the respondents who experience low back pain occurance and work shift are 67 people (88.2%), while the respondents who experience low back pain occurance and not work in shift are 24 nurses (48%).

The result of statistical test by using chi square test obtained the score of P value = 0.001 which means P<0.05, then null hypothesis (Ho) is rejected. Therefore, it can be concluded that there is significant correlation between work shift and low back pain occurance.

3.2.6. The Correlation Between Age and Low Back Pain Occurance

Table 13: The Correlation Between Age and Low Back Pain Occurance in Nurses at Annisa Hospital Pekanbaru.

Ages	Low back pain occurance						P value	POR 95% CI
	Low Back Pain		Not Low Back Pain		Total			
	N	%	N	%	N	%		
Yes	67	88,2	9	11,8	76	100	0,001	39 (13,988-109,204)
No	8	16	42	84	50	100		
Total	75	59,5	51	40,5	126	100		

Based on the table above, it can be known the result of the correlation between ages and low back pain occurance is that there are more respondents experiencing low back pain occurance and risky ages in the amount of 67 nurses (88.2%), compared to the respondents who experience low back pain occurance and not risky ages in the amount of 8 nurses (16%).

The result of statistical value by using chie square test obtained P value = 0.001 which means P<0.05, then null hypothesis (Ho) is rejected. Thus, it can be concluded that there is significant correlation between ages towards low back pain occurance.

3.3. Multivariate

The initial stage of multivariate analysis is determining the potiential independent variable (multivariate candidate variable) which will be included into multivariate analysis os the variable the results of bivariate analysis that has p score < 0.25. Multivariate analysis used is double logistic regression test prediction model (Hastono, 2007).

From the table above, it can be seen that pregnancy variables have p value >0.25, then in multivariate analysis, the variable involved into the modeling is work posture variable, IMT, and Ages.

At Table 15, it shows variable work posture (OR = 5.8), IMT (OR = 4.5), and Ages (OR = 5) have cause and effect correlation to the occurance of low back pain (LBP).

Table 14: The Results of Bivariate Analysis Selection.

No	Variables	P-*value*	Description
1	Work Posture	0,010	Candidate
2	IMT	0,026	Candidate
3	Work Period	0,723	Not Candidate
4	Work Length	0,382	Not Candidate
5	Work Shift	0,528	Not Candidate
6	Ages	0,017	Candidate
Sources: The Primary Data			

Table 15: Multivariate Modeling I.

No	Variables	P*value*	OR
1	Work Posture	0,010	0,585
2	IMT	0,037	4,587
3	Ages	0,026	5,033
Sources: The Primary Data			

4. Discussion

4.1. Bivariate

4.1.1. The correlation between work posture and low back pain occurance

Based on the table above, it can be known the result of the correlation between work posture and low back pain occurance is that; there are more respondents who have risky work posture and experience low back pain occurance in the amount of 68 nurses (89.5%), compared to the respondents who do not have risky work posture and experience low back pain occurance in the mount of 9 nurses (18%). The result of the statistical test through chi square test obtained P value = 0.001 which means P<0.05, then null hypothesis (Ho) is rejected. Therefore, it can be concluded that there is significant correlation between work posture and low back pain occurance. This is because in doing their job, nurses often do bending movement, twisting the body, especially around low back bone, lifting heavy objects, and transfer the patients. Beside that, the nurses do many jobs manually.

This is in line with the research results about the body posture with low back pain complain. The analysis on the risk level of body posture at sewing stage conducted by using measurement tool Rapid Upper Limb Assessment (RULA). The low back pain also

can be caused by the muscles that experience tension stated as achy pain. That condition can becaused by the sitting posture, wrong standing posture, or wrong sleeping posture [3].

Beside that, a research also states that the work posture has correlation to the occurance of low back pain, such as wrong work posture, clumsy work posture, and out of the habit that add the risk of injury at part of musculoskeletal system [4].

This research is also in accordance with a research in which from the results of the observation during the research at Local Hospital Selasih Pangkalan Kerinci, it was found out that there is correlation between work posture and low back pain occurance. This is because of the nurses' work activities such as bending, standing for too long, and lifting the patients [5].

4.1.2. The correlation between body mass index (IMT) and low back pain occurance

The results of statistical test by using cross sectional test obtained the score of P value = 0.001 which means the score of $P < 0.05$, then null hypothesis (Ho) is rejected. Therefore, it can be concluded that there is significant correlation between IMT towards low back pain occurance. This is in line with the research which also states that there is not significant correlation between body mass index with low back pain occurance [6].

The results of this research are in line with the research on 513 patients at Marka Medical Center Amman, Jordan about the correlation between low back pain and obesity which says there is significant correlation with p value = 0.001 between low back pain and obesity. Obesity patients have bigger risk on experiencing the occurance of low back pain [7].

The excessive burden on the back bone can cause invertebrate disc pressure. The excessive pressure can cause space between vertebrate disk and it narrows down. This will enlarge the possibility of pinched of nerve vibers which come out from invertebrate foramen and small blood vessels which flows through rumbar area. The nerve tissue is flowed, and pinched blood vessels will decrease their ability in doing conraction and relaxation. The muscle fatigue appears faster and pain occurs. In the people who have excessive body mass, then the risk of low back pain becomes bigger too because of burden of heavy joints also increase until it can increase the occurance of low back pain.

4.1.3. The correlation between work period and low back pain occurance

The result of the statistical test by using chi square test obtained the P value = 0.001 which mans P<0.05, then null hypothesis (Ho) is rejected. Therefore it can be concluded that there is significant correlation between work period towards low back pain occurance. Based on the table above it can be known the result of the correlation between work period and low back pain occurance.

Work period has strong correlation to the complain of the muscle and increase the risk of MSDs. The muscle burden and the bone in a long time cause narrowing disc cavity permanently and also cause back bone degeneration. This causes low back pain which is the part of MSDs complain. In line with the research that showing there is correlation between the work period and low back pain complaint [3].

4.1.4. The correlation between work length and low back pain occurance

The result of statistical test by using chi square test obtained the score of P value = 0.001 which means P < 0.05, then null hypothesis (Ho) is rejected. Therefore, it can be concluded that there is significant correlation between work length and low back pain occurance.

The result of this research is in line with another research in which work length affects low back pain occurance (LBP) [3]. This is also in accordance with the research in which there is significant correlation between work length and low back pain occurance (LBP) [5]. Working time for a worker in doing their job suppose to be not more than 8 hours/day. The decrease of efficiency in working causes the emergence of fatigue, disease caused by the work and accident that can occur cause of the working time exceeds the limits. The work frequency has correlation to physical condition of the worker. Heavy physical work will influence muscle work, if the work lasts for a long time without any enough rest then the ability of the body will decrease and can cause illness in the body parts.

4.1.5. The correlation between work shift and low back pain occurance

The result of the statistical test by using chi square test obtained P value = 0.001 which means P<0.05 then null hypothesis (Ho) is rejected. Therefore it can be concluded that there is significant correlation between work shift towards low back pain occurance.

The result of this research is in line with the research in which the work shift affects low back pain occurance (LBP) [3]. This is also in line with the research in which there is significant correlation between work shift and low back pain occurance (LBP) [5].

4.1.6. The correlation between age and low back pain occurance

The result of the statistical test by using chi square test obtained the score of P value = 0.001 which means P<0.05 then null hypothesis (Ho) is rejected. Therefore it can be concluded that there is significant correlation between ages and low back pain occurance. The result of this research is in line with the research conducted in which the age affects low back pain occurance [3]. This is also in line with the research conducted in which there is significant correlation between ages and low back pain occurance [5].

The older the ages of someone, then their risk in experiencing decrease on bone elasticity also becomes higher. This is in line with the theory of work capacity of someone in doing their job until certain limitation of time, in line with the ages getting older experienced by those individuals. By the increasing of ages of someone, then the process of fibrosis and classification in the back bone gets close to each other until it ease the emergence of pain around the low back bone.

4.2. Multivariate analysis

The result of multivariate analysis obtained Odd Ratio (OR) from work posture variable (OR = 5.8), IMT (OR = 4.5), and Ages (OR = 5) have cause and effect correlation to low back pain occurance (LBP).

5. Conclusion

Based on the research results, it can be known that the factors correlating to low back pain complain are significant towards the nurses at Annisa Hospital Pekanbaru such as work posture, IMT, and ages and there is no counfounding.

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Conflict of Interest

None

References

[1] Munir, S. (2012). Analisis Nyeri Punggung Bawah Pada Pekerja Bagian Final Packing dan Part Supply di PT.X. Jakarta: lib.ui.ac.id.

[2] Cahyati, A. (2012, April). Merawat Tanpa Nyeri Punggung Bawah.

[3] Pravikasari, N. (2014). Pengaruh Senam Hamil dan Teknik Akupresur terhadap Kejadian Nyeri Punggung Bawah pada Ibu Hamil Trisemester III di Wilayah Puskesmas Ungaran. Semarang: eprints.undip.ac.id.

[4] Syahrial. (2008). Beberapa Faktor yang Berhubungan terhadap Tingkat Kejadian Subyektif Nyeri Punggung Bawah Pada Pekerja Kain Batik Sekapur Sirih Jambi.

[5] Septiawan, H. (2012). Faktor yang berhubungan dengan Kejadian nyeri punggung bawah pada pekerja bangunan di PT Mikroland Property Development Semarang Tahun 2012. Semarang: lib.unnes.ac.id.

[6] Bull, E., & Archard, G. (2007). Nyeri Punggung. Jakarta: Penerbit Erlangga.

[7] Lailani, T. M. (2013). Hubungan Antara Peningkatan Indeks Massa Tubuh dengan Kejadian Nyeri Punggung Bawah pada Pasien Rawat Jalan di Poliklinik Saraf RSUD Dokter Soedarso.Jurnal.untan.ac.id.