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Characteristics and associated factors of low back pain among nurses at King Fahad Medical City, Riyadh, Saudi Arabia: A cross-sectional study

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Abstract

Background: Low back pain (LBP) is one of the most common causes of musculoskeletal problems and causes significant misery and disability among nurses. In this study we looked into LBP in terms of characteristics, interference with daily activities, absenteeism from work, and choice to change careers among nurses from various specialties in a tertiary care hospital in Riyadh, Saudi Arabia.

Methods: This was a cross-sectional study, conducted among nurses working at King Fahad Medical City (KFMC), Riyadh, Saudi Arabia. Data was collected via a questionnaire that was developed by the study authors and reviewed by two consultants. The questionnaire was in a Google form.

Results: A total of 423 nurses participated in the current study, 83.9% were females. For work fatigue, 33.3% of the participants reported "very often", and 33.3% reported "often". The pattern of pain occurrence was irregular by 38.5%, and the pain nature was mainly spasm (33.1%), with moderate severity by 48.9%, and mild severity by 31% of the participants. The highest percentage (35.9%) reported using treatment for pain, 56% reported not taking sick leave, and 35.5% have plans to quit work. The majority (92.7%) of the participants change their position frequently to make their lower back comfortable. There was a statistically significant difference ($P<0.05$) between males and females in the risk of LBP according to each of the following: housework, mode of transport, mattress hardness, professional title, maximum weight lifted, and work fatigue. The significant associated factors with LBP by professional title were the service length, total time per day spent sitting, total time per day spent carrying, maximum weight lifted, work fatigue, pattern of pain occurrence, and nature of pain.

Conclusion: we highlighted the characteristics of nurses with low back pain working at King Fahad Medical City, Riyadh, Saudi Arabia. Also, we assessed the associated factors with low pain among the studied participants.

Keywords: low back pain; nurses; hospital; patient; exercise.

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1. Introduction

Low back pain (LBP) is one of the most common causes of musculoskeletal problems [1]. It is a neglected health issue that causes significant misery and disability among nurses [2]. LBP is described as a discomfort, stiffness, or muscular tension localized between the lower rib border and the buttock creases, with or without sciatica (pain radiating from the buttock and downward along the sciatic nerve path) [3,4]. LBP is a common musculoskeletal ailment that affects people of all ages, from children to the elderly, and practically everyone at some point in their lives, whether it is an acute episode or a chronic problem [3, 5].

According to what is recently (2023) published in the Lancet [6], the worldwide epidemic of low back pain is escalating. In 2020, 619 million individuals worldwide (almost 10% of the global population) suffered from low back pain, and by 2050, that figure is predicted to rise to 843 million. In addition, both the total disability load and disease-related costs are likely to rise further in the future decades [7].

Nurses are the most vulnerable group of health workers [8]. The majority of nurses in any hospital suffer from low back pain, whether from occupational or personal causes, and the cause of low back pain is frequently multifaceted [9]. Low back discomfort reduces labor productivity and labor force participation, resulting in economic loss. It has an indirect impact on the country's society and economy. According to Harrington and Gill's research, lower back pain is the top cause of early retirement due to illness, sick leave, job changes, and decreased work speeds [8].

Many factors, including active patient handling and care, years of employment, and low job satisfaction, have been observed to increase the incidence of LBP among nurses [10]. Anxiety and depressive disorders have also been linked to an increase in the prevalence of LBP among nurses [10]. LBP has been proven to reduce nurse productivity at work, resulting in deterioration in the quality of care delivered to patients [11, 12]. Furthermore, nurses with LBP were more likely to report a decline in job satisfaction [11-13]. Absenteeism from work is also higher among nurses who have LBP [11-13]. According to a study conducted in Belgium, LBP was responsible for 12% of absenteeism lasting more than 28 days [13].

A study in this regard published from Jeddah, Saudi Arabia in 2018 showed that LBP was found to be prevalent in 61.7% of nurses. LBP was the most common site of injury, accounting for 51.2% of all injuries. The severity of the injury was usually mild to severe, and 20% of the nurses with LBP worked in obstetrics and gynecology wards. In addition, the authors found that 66.7% of the nurses who participated suffered LBP just after starting the nursing profession [14].

The purpose of this study was to look into LBP in terms of characteristics, interference with daily

activities, absenteeism from work, and choice to change careers among nurses from various specialties in a tertiary care hospital in Riyadh, Saudi Arabia. The collected data is expected to give the required knowledge for implementing preventative measures against back pain and moderating LBP risk factors.

2. Subjects and Methods

This was a cross-sectional study that has been conducted at King Fahad Medical City (KFMC), Riyadh, Saudi Arabia, during the period from 31 of July 2022 to 31 of July 2023.

The study populations were nurses working at KFMC, Riyadh, Saudi Arabia. The inclusion criteria were nurses providing direct patient care, having more than 6 months of experience at the study site, and being willing to participate in the study.

The data collection tool for the current study was a questionnaire that was developed by the study authors and reviewed by two consultants. The questionnaire consists of items that cover participants' socio-demographic data and others that fulfill the study objectives (time spent in setting, standing, bending or leaning, frequency of bending or leaning, frequency and duration of carrying, maximum weight lifted, pattern, nature and severity of pain, ….ect)

A pilot study was conducted to test the clarity and reliability of the questionnaire among 10 nurses. Participants in the pilot study found that the questionnaire was clear and easy to be answered, and they answered it without facing any difficulties. This proves the reliability and validity of the questionnaire as well as the checklist used in the current study.

The questionnaire was in a Google form, the link was sent to the nurses and the aims of the study were explained at the beginning, they were also informed that participation is completely voluntary, and their data will be kept confidential and will be used for research purposes only. If they agree to participate, they will be directed to fill up the questionnaire.

The study was conducted after taking ethical approval from the Ethical Review Committee at the KFMC research center, number: (IRBC/23/055).

2.1 Statistical analysis

Data were analyzed by using Statistical Package for Social Studies (SPSS 22; IBM Corp., New York, NY, USA). Continuous variables were expressed as mean ± standard deviation and categorical variables were expressed as percentages. The chi-square test was used for categorical variables. A p-value <0.05 was considered statistically significant

3. Results

A total of 423 nurses participated in the current study, most (83.9%) of them were females, 30.5% were in the age group of 31-35 years old, 62.4% were married, 66.9% were Philippines, and 88.9% have

a bachelor's degree or above. The mean weight of participants was 65.67kg (±13.78) and height was 159.04cm (±8.64). Participants' characteristics are shown in Table (1).

Table (1) Characteristics of the participants(N=423)

Variables		Number	%
Gender	Male	68	16.1
	Female	355	83.9
Age	18-25	17	4.0
	26-30	39	9.2
	31-35	129	30.5
	36-40	96	22.7
	41-45	46	10.9
	46-50	44	10.4
	51-55	47	11.1
	56-60	5	1.2
Nationality	Philippines	283	66.9
	Saudi	65	15.4
	Indian	43	10.2
	Other	32	7.6
Educational Background	Diploma	47	11.1
	Bachelor's degree or above	376	88.9
Marital status	Married	264	62.4
	Single	151	35.7
	Other	8	1.9

Assessment of the associated factors with low back pain (LBP) among nurses (N=423). More than half of the respondents (52%) reported no history of pregnancy, 53% reported doing physical exercise sometimes, the highest percentage (37%) often doing housework, and almost two-thirds of the participating nurses are walking. The highest percentage of the participants (61.7%) use intermediate mattress hardness and 76.6% lie on their side. For the length of service, the highest percentage (26.7%) of the nurses worked for 6-10 years, while almost 6% worked for a period that exceeded 20 years. when the nurses were asked about the total time per day spent sitting, standing, and bending or leaning forward, the highest percentage (36.4%, 71.9%, and 40.2%) reported 30 minutes-2 hours, 4-6 hours, and 30 minutes-2 hours, respectively. for the frequency of bending or leaning forward, 38.1% reported 0-5 times/hour, and 31.2% 5-10 times/hour. For carrying, total time spent per day the highest percentages (32.9%, 32.2%) reported 0-30 minutes, and 30 minutes -2 hours, respectively. almost 37% of the participating nurses lifted >20 kg.

For work fatigue, one-third (33.3%) of the participants reported "very often", and another third

(33.3%) reported "often", and the age at onset was mostly (60%) 31-50 years. The pattern of pain occurrence was irregular by 38.5%, and the pain nature was mainly spasm (33.1%), with moderate severity by 48.9%, and mild severity by 31% of the participants. The highest percentage of the participants (35.9%) reported using treatment for pain, more than half (56%) reported not taking sick leave, and 35.5% have plans to quit work.

The majority (92.7%) of the participants change their position frequently to make their lower back comfortable, 82.3% bend or squat as little as possible, 76.4% avoid some heavy housework, 70.4% lie down to rest frequently, and 55.3% walk more slowly than usual.

A percentage of 54.6% of the nurses reported sleeping poorly, 48.5% are angered more easily, 58.4% go upstairs more slowly than usual, and 30% have difficulty putting on socks/stockings

The results of the current study revealed a statistically significant difference between males and females in the risk of low back pain according to each of the following: housework, mode of transport, mattress hardness, professional title, maximum weight lifted, work fatigue, and plans to quit work, since all p values were <0.05.

Table (2.1) Assessment the associated factors with low back pain (LBP) among nurses by Professional title

		Nurse(N=307)		Primary nurse(N=96)		Chief nurse(N=20)		P value
		Number	%	Number	%	Number	%	
Pregnancy history	Yes	156	50.81	41	42.71	6	30.00	0.098
	No	151	49.19	55	57.29	14	70.00	
Physical exercise	Never	10	3.26	7	7.29	1	5.00	0.082
	Rarely	78	25.41	14	14.58	3	15.00	
	Sometimes	158	51.47	55	57.29	11	55.00	
	Often	46	14.98	20	20.83	4	20.00	
	Very often	15	4.89	0	0.00	1	5.00	
Housework	Never	5	1.63	3	3.13	0	0.00	0.063
	Rarely	16	5.21	10	10.42	2	10.00	
	Sometimes	84	27.36	32	33.33	11	55.00	
	Often	122	39.74	34	35.42	4	20.00	
	Very often	80	26.06	17	17.71	3	15.00	
Mode of transport	Walking	209	68.08	64	66.67	10	50.00	0.446
	Bicycle	2	0.65	0	0.00	0	0.00	
	Car	96	31.27	32	33.33	10	50.00	
Mattress hardness	Very soft	6	1.95	6	6.25	1	5.00	0.463
	Soft	90	29.32	25	26.04	6	30.00	
	Intermediate	192	62.54	57	59.38	12	60.00	
	Hard	19	6.19	8	8.33	1	5.00	
Sleeping Position	Lying on side	239	77.85	70	72.92	15	75.00	0.172
	Lying Supine	56	18.24	20	20.83	2	10.00	
	Lying Prone	12	3.91	6	6.25	3	15.00	
Length of Service (Years)	1-5	71	23.13	39	40.63	2	10.00	<0.001*
	6-10	95	30.94	16	16.67	2	10.00	
	11-15	75	24.43	26	27.08	6	30.00	
	16-20	49	15.96	12	12.50	4	20.00	
	21-25	8	2.61	2	2.08	5	25.00	

	26-30	8	2.61	1	1.04	0	0.00	
	31-35	1	0.33	0	0.00	1	5.00	
Total time per day spent sitting	0-30 min	52	16.94	26	27.08	1	5.00	0.001*
	30 min-2 hr	107	34.85	41	42.71	6	30.00	
	2-4 hrs	84	27.36	20	20.83	5	25.00	
	4-6 hr	52	16.94	9	9.38	7	35.00	
	6-8 hr	12	3.91	0	0.00	1	5.00	
Total time per day spent standing	0-30 min	9	2.93	7	7.29	1	5.00	0.080
	30 min-2 hr	28	9.12	9	9.38	5	25.00	
	2-4 hr	46	14.98	10	10.42	4	20.00	
	4-6 hr	224	72.96	70	72.92	10	50.00	
Total time per day spent bending or leaning forward	0-30 min	76	24.76	31	32.29	5	25.00	0.601
	30 min-2 hr	122	39.74	38	39.58	10	50.00	
	2-4 hr	92	29.97	22	22.92	5	25.00	
	6-8 hr	17	5.54	5	5.21	0	0.00	
Frequency of bending or leaning forward	0-5 times/hr	118	38.44	36	37.50	7	35.00	0.995
	5-10 times/hr	96	31.27	28	29.17	8	40.00	
	10-15 times/hr	48	15.64	17	17.71	3	15.00	
	15-20 times/hr	26	8.47	8	8.33	1	5.00	
	>20 times/hr	19	6.19	7	7.29	1	5.00	
Total time per day spent carrying	0-30 min	95	30.94	31	32.29	13	65.00	0.009*
	30 min-2 hr	107	34.85	25	26.04	4	20.00	
	2-4 hr	58	18.89	28	29.17	3	15.00	
	4-6 hr	34	11.07	5	5.21	0	0.00	
	6-8 hr	13	4.23	7	7.29	0	0.00	
Duration of carrying	0-5 times/hr	176	57.33	45	46.88	14	70.00	0.161
	5-10 times/hr	70	22.80	29	30.21	4	20.00	
	10-15 times/hr	44	14.33	15	15.63	2	10.00	
	15-20 times/hr	13	4.23	2	2.08	0	0.00	
	>20 times/hr	4	1.30	5	5.21	0	0.00	
Maximum weight lifted	0-5 kg	102	33.22	14	14.58	11	55.00	<0.001*
	10-15 kg	70	22.80	21	21.88	6	30.00	
	15-20 kg	32	10.42	9	9.38	1	5.00	
	> 20 kg	103	33.55	52	54.17	2	10.00	
Work fatigue	Never	6	1.95	1	1.04	0	0.00	0.007*
	Rarely	19	6.19	2	2.08	3	15.00	
	Sometimes	88	28.66	17	17.71	5	25.00	
	Often	105	34.20	28	29.17	8	40.00	
	Very often	89	28.99	48	50.00	4	20.00	

* Significant p value

When the associated factors with low back pain (LBP) among nurses were assessed by professional title (nurse, primary nurse, and chief nurse), it was found that the difference was statistically significant (P value <0.05) by the length of service, total time per day spent sitting, total time per day spent carrying, maximum weight lifted, work fatigue, pattern of pain occurrence, and nature of pain. Data is shown in Table 2.1 and 2.2.

Table (2.2) Assessment the associated factors with low back pain (LBP) among nurses by Professional title

		Nurse(N=307)		Primary nurse(N=96)		Chief nurse(N=20)		P value
		Number	%	Number	%	Number	%	
Age at onset (years)	18 - 30	101	32.90	44	45.83	7	35.00	0.077
	31 - 50	190	61.89	51	53.13	13	65.00	
	51 - 65	16	5.21	1	1.04	0	0.00	
Pattern of pain occurrence	Irregular	127	41.37	28	29.17	8	40.00	0.017*
	Rare	68	22.15	13	13.54	6	30.00	
	Constant	74	24.10	34	35.42	3	15.00	
	Periodic	38	12.38	21	21.88	3	15.00	
Nature of pain	Distending pain	39	12.70	19	19.79	4	20.00	0.006*
	Spasm	112	36.48	21	21.88	7	35.00	
	Sustained pain	35	11.40	7	7.29	2	10.00	
	Pricking	22	7.17	1	1.04	3	15.00	
	Tenderness	47	15.31	14	14.58	2	10.00	
	Shooting pain	18	5.86	14	14.58	1	5.00	
	Stabbing pain	24	7.82	14	14.58	0	0.00	
	Burning pain	10	3.26	6	6.25	1	5.00	
Pain severity	Mild	92	29.97	30	31.25	9	45.00	0.116
	Moderate	159	51.79	40	41.67	8	40.00	
	Severe	41	13.36	22	22.92	1	5.00	
	Very severe	11	3.58	4	4.17	1	5.00	
	Intolerable	4	1.30	0	0.00	1	5.00	
Most sever degree of pain	Mild	63	20.52	22	22.92	9	45.00	0.019*
	Moderate	150	48.86	37	38.54	7	35.00	
	Severe	68	22.15	26	27.08	0	0.00	
	Very severe	16	5.21	9	9.38	2	10.00	
	Intolerable	10	3.26	2	2.08	2	10.00	
Treatment	Never	87	28.34	33	34.38	5	25.00	0.389
	Rarely	84	27.36	17	17.71	5	25.00	
	Sometimes	111	36.16	34	35.42	7	35.00	
	Often	23	7.49	10	10.42	2	10.00	
	Very often	2	0.65	2	2.08	1	5.00	
Sick leave (days/year)	0	176	57.33	51	53.13	10	50.00	0.744
	1	38	12.38	12	12.50	5	25.00	
	2	37	12.05	14	14.58	3	15.00	
	3	20	6.51	4	4.17	1	5.00	
	4	9	2.93	3	3.13	1	5.00	
	5	14	4.56	3	3.13	0	0.00	
	6-10	8	2.61	5	5.21	0	0.00	
	>10	5	1.63	4	4.17	0	0.00	
Plans to quit work	Never	89	28.99	20	20.83	9	45.00	0.047
	Rarely	51	16.61	8	8.33	2	10.00	
	Sometimes	101	32.90	41	42.71	8	40.00	
	Often	35	11.40	11	11.46	1	5.00	
	Very often	31	10.10	16	16.67	0	0.00	
I change position frequently to make my lower back comfortable	Yes	285	92.83	91	94.79	16	80.00	0.068
	No	22	7.17	5	5.21	4	20.00	
I bend or squat as little as possible	Yes	252	82.08	81	84.38	15	75.00	0.599
	No	55	17.92	15	15.63	5	25.00	
I avoid doing some heavy housework	Yes	236	76.87	75	78.13	12	60.00	0.204
	No	71	23.13	21	21.88	8	40.00	
I lie down to rest	Yes	222	72.31	68	70.83	8	40.00	0.009*

frequently	No	85	27.69	28	29.17	12	60.00	
I walk more slowly than usual	Yes	170	55.37	59	61.46	5	25.00	0.012*
	No	137	44.63	37	38.54	15	75.00	
I sleep poorly	Yes	166	54.07	56	58.33	9	45.00	0.517
	No	141	45.93	40	41.67	11	55.00	
I am angered more easily	Yes	147	47.88	50	52.08	8	40.00	0.572
	No	160	52.12	46	47.92	12	60.00	
I go upstairs more slowly than usual	Yes	171	55.70	66	68.75	10	50.00	0.057
	No	136	44.30	30	31.25	10	50.00	
I use a handrail to go upstairs	Yes	133	43.32	42	43.75	6	30.00	0.495
	No	174	56.68	54	56.25	14	70.00	
I have difficulty putting on socks/stockings	Yes	87	28.34	35	36.46	5	25.00	0.280
	No	220	71.66	61	63.54	15	75.00	

* Significant p value

4. Discussion

The current study highlights the characteristics and risk factors of low back pain among nurses at King Fahad Medical City, Riyadh, Saudi Arabia. According to previous studies, the annual prevalence of low back pain in hospital employees ranges from 6% to 87% [15-17].

Though the etiology and precise causes of LBP are unknown, previous studies [18, 19] have identified a substantial association between LBP and several work-related factors, which is consistent with the findings of this study. Heavy physical exertion by nurses, such as manually carrying patients, renders them more susceptible to LBP [20], increasing nurses' absence from work and early retirement due to illness [21].

Aside from its widespread incidence, low back pain has significant medical, economic, and professional consequences. Drug therapy was required in 70.4% of the low back pain individuals in our study. Such a percentage is far higher compared to what was reported in other previous studies. Drug therapy was required in 58.6% of the low back pain individuals in a study by Boughattas W. et al. [22], Bejia et al. [23] showed that 42% of low back pain patients sought medical treatment in a research conducted at Fattouma Bourguiba Hospital in Monastir. In addition, According to Karahan et al. [24], 33.3% of participants with low back discomfort required medical therapy.

In terms of absenteeism caused by lower back pain, it was greater in our study (44%) than in the literature, where the percentage of absenteeism ranged between 15% and 38% [22, 25-29]. This can be explained by a greater degree of severity.

For the risk factors of LBP, age, and high BMI are frequently associated with low back discomfort in the literature [30-32]. The high number of pregnancies increases the likelihood of an outbreak of low back pain, which can be caused by the pregnancy itself or by the number of dependent children. Prolonged work with trunk torsion and material layout in the workplace were widely described in the literature [33,

34]. In addition, seniority as well as the lifting of heavy loads were reported as risk factors for LBP [35, 36].

Although women are more likely than males to sustain mechanical injuries like sprains and strains, some studies theorize that differences in anatomy, physiology, and structure between the sexes are to blame for the disproportionate number of female casualties [37, 38]. In the current study, there were statistically significant differences between males and females with LBP in terms of housework, mode of transport, mattress hardness, professional title, maximum weight lifted, and work fatigue.

Almost one-third of the nurses in the current study were 30-35 years old, which is in line with Kang's (2017) claim that the majority of nurses were between the ages of 30 and 40 [39]. This finding may be related to the nurses' continued physical condition and ability to withstand the demands of their physically demanding jobs. Additionally, Kochitty (2015) noted that back discomfort was common among people aged 35 to 45 [40].

One of the key characteristics of LBP is that it can be fully avoided if the essential safeguards are taken. According to the literature, LBP is not about what duty is performed but rather how it is performed. In this context, proper and controlled sitting, lifting legs correctly and with balance, exercising to strengthen low back and stomach muscles, correctly applying body mechanics principles, refraining from activities that press on the low back area, and taking breaks during occupational duties that require sitting or bending forward for an extended period are all important precautions [41]. Maintaining a good mental and physical life by not gaining too much weight, not smoking, and following a healthy diet and exercise routine are also useful in protecting low back health [42].

5. Conclusion

In the current study, we highlighted the characteristics of nurses with low back pain working at King Fahad Medical City, Riyadh, Saudi Arabia. Also, we assessed the associated factors with low pain among the studied participants. LBP is a common occupational illness among nurses. However, taking steps for LBP prevention in nurses is critical for nurses to exercise their fundamental right to work in a healthy and safe environment, keep their professions, and give better care to their patients.

6. Declarations

6.1 Conflict of Interest Statement

The authors have no conflict of interests to declare.

6.2 Funding Disclosure

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

6.3 Ethical Considerations

Ethical approval: Ethical approval was obtained from the Institutional Review Board (IRB) of King Fahad Medical City Hospital (IRBC/23/055) and informed written consent was taken from all participants.

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