Non- Specific Low Back Pain among Nurses in Qassim, Saudi Arabia: A Cross-Sectional Study

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Research article

Keywords: Low back pain, Prevalence, Risk factors, Qassim, Saudi Arabia

Posted Date: December 29th, 2020

DOI: https://doi.org/10.21203/rs.3.rs-59629/v2

Abstract

Background: Non-specific Low back pain (LBP) is a complex and multifactorial health problem. Evidence has shown that LBP is an important occupational hazard and nurses are particularly at high risk. While several studies have addressed the prevalence of LBP worldwide, the prevalence of LBP in Saudi Arabia remains unclear. In this study we aimed to estimate the prevalence and associated factors of LBP among nurses in Qassim region, Saudi Arabia.

Methods: This was a multicenter cross-sectional study carried out in four major public hospitals in Qassim region. A total of 323 nurses were recruited through a two-stage sampling method. A previously validated questionnaire was used to gather data. The main outcome measures were; LBP prevalence during working life, demographic factors, life-style factors, work-related factors and psychological factors. Multivariable logistic regression analysis was used to determine factors independently associated with LBP.

Results: The study showed that LBP prevalence was 65.6%. Over one third of study participants sought treatment for LBP (38.7%). Age and the type of ward were found significantly associated with LBP (aOR: 0.39; 95% CI: 0.19, 0.77; p value=0.007) & (aOR: 0.36; 95%CI: 0.15, 0.86; p value =0.02), respectively. However, gender, working hours, number of patients, stress and smoking were not identified as LBP risk factors in this study.

Conclusion: The findings of this study suggest that LBP is a highly prevalent occupational health problem among nurses in Qassim. The highest LBP prevalence in this study was found among nurses aged 20-30 year. Nurses working in the general surgery wards showed a lower risk for LBP. On-the-job training is essential particularly for new and young nurses on proper body mechanics when mobilizing patients or lifting heavy equipment. In addition, there is a need for evidence –based interventions to improve the work-place environment for nurses in hospitals in order to lower LBP prevalence.

Background

Low back pain (LBP) is a common complaint that needs medical attention. Indeed, LBP is the commonest musculoskeletal disorder among adults with a prevalence reaching 84% [1]. It has a complex etiology and may originate from different spinal structures including muscles and fascia, joints, ligaments, discs or nerve roots [2]. However, in many cases no definitive cause can be determined. Non-specific LBP is a term used when the underlying cause cannot be specifically identified [1]. The diagnosis of non-specific LBP is generally made upon the exclusion of other known causes for the LBP such as infections, trauma or neoplasms [3]. It commonly refers to pain localized in the posterior region of the body extending from below the costal margin down to the gluteal folds with or without referred pain into one or both legs, lasting for at least 1 day [4]. Throughout this paper we will use the abbreviation LBP to refer to non-specific low back pain.

LBP may result in major economic losses. Health care expenditure on LBP in terms of costs of care and treatment is significant [5]. Prior evidence has shown that recurrent back pain was strongly associated with increased odds of leaving paid employment for health related reasons [6]. LBP may also lead to many physical and psychological complications. Owing to the nature of their job nurses are considered among the groups at high risk for LBP [7-9]. There were three cross-sectional studies which identified work-related factors such as lifting and mobilizing patients, inappropriate work design, sustained postures, decreased social support, low job satisfaction, and inadequate staffing as the main risk factors for LBP among nurses [10 -12]. It has also been found that LBP adversely influences the productivity of nurses and thus undermines the overall quality of healthcare services provided to beneficiaries [13]. Moreover, LBP has a great impact on the health care system, particularly in terms of work absenteeism, and escalating healthcare costs [14].

Psychosocial factors were also found to be linked with the risk for LBP [15]. The increased demand of the job in terms of prolonged working hours, night shifts, spending long time away from their families may negatively impact the psychological status of nurses. In addition, low job satisfaction, increased workload and poor work relationships may result in stress and anxiety [16, 17].

A little is known about the burden of LBP among nurses in Saudi Arabia. A previous study on the prevalence of LBP among physical therapists revealed a high prevalence of 89.65%. The study also found that gender and duration of patient contact were associated with LBP [18].Another study which was conducted among health care workers in southwestern region of Saudi Arabia estimated LBP as 73.9% [19]. Furthermore, a community-based survey that was carried out in Qassim has only focused on the prevalence of back pain among the general population. Over 5000 adults participated in the survey which reported a relatively low prevalence of 18.85%. The survey also showed that age, depression, and certain occupations were associated with back pain [20]. A few researchers have addressed the problem of LBP in Saudi Arabia. This raises questions about how big this problem is among healthcare professionals and particularly among nurses. The scarcity of evidence for LBP in Saudi Arabia was the main driving force to carry out this investigation. In this study we aimed to determine the prevalence of low back pain among nurses working in the public health sector in Qassim in order to gain insight into the magnitude of this problem and its predicting factors.

Methods

Study setting

This was a multicenter cross-sectional study carried out in Qassim region in Saudi Arabia. Qassim is located in the center of the kingdom, northwest to the capital Riyadh. It is well known for its administrative & agricultural values. In this study ,four major public hospitals representing the four major cities in Qassim were included, namely; King Fahd Specialist Hospital (Buraidah), Ar Rass General Hospital (Ar Rass) , King Saud Hospital (Onaizah), and Al Bukairiyah General Hospital, (Al Bukairiyah). The total numbers of nurses working in these four hospitals were 562,313, 528, and 157 respectively.

Study population

A total of 323 nurses were recruited in this study .A two-stage sampling technique was employed. In the first stage, hospitals were selected (primary sampling units). Eligible hospitals were public facilities which provide inpatient care, and admit all types of cases. Four hospitals serving large catchment areas in Qassim were included. Secondly, a sample of professional nurses was recruited from each hospital (secondary sampling units). Those were registered nurses from both sexes who were on full-time jobs and were on duty during the data collection period. Those who were on official leave were excluded.

Eligible nurses in the selected hospitals were invited for the study. We calculated the sample size using the single population proportion equation ($N=Z^2\ p\ (1-p)\ /\ d^2$). An assumed prevalence of LBP of 70% was used based on previous evidence [19, 21, 22], a precision level of 5% and 95% confidence level. That yielded the target sample size of 323 nurses.

The Questionnaire

The prevalence of low back pain and other related data were measured through the administration of an anonymous, self-administered questionnaire. The questionnaire was adopted from a previous study by Branny and Newell, [23].It was originally used to assess LBP among nurses in the UK. One advantage of using an existing questionnaire is that it can aid in validating previous findings, although some variations might be expected. Historically, practicing nurses in Saudi Arabia come from diverse cultural backgrounds and are fluent in English. Their work responsibilities, however don`t differ substantially from those expected in western countries. In the present study no modifications were made in the questionnaire and we used it unchanged. The questionnaire is composed of four parts; job-related history, LBP characteristics, LBP treatment options, and socio-demographic factors. LBP was defined with an aid of a diagram to depict the area of pain localization. The definition and illustration used in this questionnaire were the same used in other British surveys on back pain [21]. Questionnaires were hand distributed, and informed consent was obtained from nurses who agreed to take part in the study. The study protocol was reviewed and approved by the regional institutional review board in Qassim.

Data Analysis

The statistical analysis was performed in two steps. First, descriptive statistics analysis was performed. Background data related to socio-demographic risk factors, work history and prevalence of LBP were presented as simple frequencies (and percentages). Secondly, inferential statistics in the form of logistic regression analyses were performed. Initially univariate logistic regression was used to calculate crude odds ratios (Unadjusted ORs) and determine potential risk factors for LBP separately. Next, multivariate logistic regression analysis was performed to obtain adjusted Odds ratios (aORs) and 95% confidence intervals (95%CI) to identify variables significantly associated with LBP considering the effect of potential confounders.

Results

In this study, a total of 323 questionnaires were distributed .All participants completed the questionnaire resulting in a response rate of 100%. For ease of administration all questionnaire items were all closed-ended. In table (1) the socio-demographic profile of participants was described. Female comprised the vast majority among participants (n= 302,93.5%). Most participants (n= 195,60.4%) belong to the age group 20-30 years. Smoking habit was observed among only 5% (n= 16)of the participants. Regular physical activity was reported by 31%(n=100) of participants . Feeling low in mood or under stressed were reported by 77.1% and 82.9% of participants, respectively.

Table (1): Demographic & life style characteristics of nurses, Qassim, Saudi Arabia (n=323)

Characteristic	N (%)
Gender	
Male	21(6.5%)
Female	302 (93.5%)
Age group	
20- 30 years	195 (60.4%)
31-40 years	99 (30.7%)
Over 40 years	29 (9.0%)
Smoking	
No	307 (95%)
Yes	16 (5.0%)
Regular Physical activity	
No	223 (69.0%)
Yes	100 (31.0%)
Feeling low in mood	
Never	74 (22.9%)
Occasionally	215 (66.6%)
Frequently	34 (10.5%)
Feeling under stress	
Never	55 (17.0%)
Occasionally	202 (62.5%)
Frequently	66 (20.4%)

Table (2) shows the work history of the participants. The majority of participants in this study were staff nurses (n=265,82.0%).Charge nurses and healthcare assistants comprised 17.1% and 0.9% respectively. A total of 183 (56%) of the study participants spent 1-5 years work duration in their current post. More than two thirds of the enrolled nurses (n= 254,78.6%) reported working on day and night shifts alike. The majority of nurses (n=262,81.1%) work over 40 hours per week. Moreover, 140(43.3%) of participants had

to work additional hours exceeding 10 hours on average per month. On a regular shift, more than half of participants (n= 187, 57.9%) reported an average of 1-5 patients require assistance mobilizing ,while 34.4% reported a higher number exceeding 5 patients per shift. Nurses in this study worked in a wide variety of wards, however, at the time of the survey a considerable number of them worked in three main wards; general medical, intensive care,and general surgical ward comprising 19.8%21.7% and 18.9% respectively.

Table (2): Work-related characteristics of nurses, Qassim, Saudi Arabia (n=323)

Characteristic	N(%)
Current post	
Healthcare assistant	3 (0.9%)
Staff nurse	265 (82.0%)
Charge nurse /sister	55 (17.1%)
Work duration in the current post	
less than one year	41 (12.7%)
1-5 years	183 (56.7%)
More than 5 years	99 (30.7%)
Type of shifts	
Days only	67 (20.7%)
Nights only	2 (0.6%)
Days and nights	254 (78.6%)
Work hours per week	
20- 40 years	61 (18.9%)
Over 40 years	262 (81.1%)
Additional work hours per month	
None	41 (12.7%)
1-10	142 (44.0%)
More than 10	140 (43.3%)
Average number of patients require assistance mobilizing per shift	
None	25 (7.7%)
1-5 patients	187 (57.9%)
Over 5 patients	111 (34.4%)
Type of ward	
General medical	64 (19.8%)
ICU	70 (21.7%)
General surgical	61 (18.9%)
Others	128 (39.6%)

The prevalence of LBP and its related characteristics are shown in table (3). This study showed a 65.6% prevalence of LBP among nurses in Qassim. over one third of them sought treatment for LBP (n=82, 38.7%). Similarly, at least one third reported difficulty performing daily activities such as getting out of bed (47.25%), sleep through the night (48.1%,), and put on socks (37.7%). However, only few reported sickness absence due to LBP (n=65, 31.7%).

Table (3): Prevalence of low back pain among nurses, Qassim, Saudi Arabia (n=323) .

Characteristic	N(%)
Low back pain	212 (65.6%)
Treatment sought for low back pain	82 (38.7%)
Low back pain Spread down the leg to below the knee	131 (61.8%)
Low back pain causing difficulty in daily activities below	
Getting out of bed	100 (47.2%)
Sleep through the night	102 (48.1%)
Standing up for 20-30minutes.	121 (57.1%)
Walking 300-400 meter	107 (50.5%)
Climb one flight of stairs	107 (50.5%)
Put on socks ,stockings or tights	80 (37.7%)
Sickness Absence due to low back pain	
None	147 (68.3%)
1-6 days	42 (19.8%)
1-4 weeks	15 (7.0%)
more than 4 weeks	8 (3.8%)

Table (4) describes the univariate and multivariate logistic regression analyses of factors significantly associated with LBP. The univariate anlaysis showed that working on a general surgical ward (OR: 0.39; 95% CI: 0.21, 0.73; *p* value = 0.004) ,and age over 40 years (OR: 0.35;95% CI: 0.16,0.78 ;*p* value=0.01) were significant factors. In the multivariate logistic regression analysis, the same variables were also found independently associated with LBP expressed as; working on a general surgical ward (aOR: 0.39; 95% CI: 0.19, 0.77; *p* value=0.007), and age over 40 years (aOR: 0.36; 95%CI: 0.15, 0.86; *p* value =0.02). However, smoking, physical activity, gender, work duration, length of working hours per week, number of patients require assistance mobilizing on a shift, depression and stress were not independent risk factors for LBP (*p* value $\geq$ 0.05).

Table (4): Univariate & Multivariate logistic regression analysis of factors associated with low back pain among nurses,Qassim,Saudi Arabia (n= 323)

Characteristic	Low Back Pain		UOR (95% CI)	p.value	AOU (95% CI)	p.value
	Yes (%)	No (%)				
Working hours per week						
20-40	46 75.4%	15 24.6%	1		1	
More than 40	166 63.4%	96 36.6%	0.564 (0.299 -1.064)	0.077	0.628 (0.314 -1.256)	0.189
Work duration in current post						
Less than one year	26 63.4%	15 36.6%	Reference		Reference	
1-5 years	119 65.0%	64 35.0%	1.073 (0.530 -2.170)	0.845	0.995 (0.467 -2.120)	0.990
More than 5 years	67 65.6%	32 34.4%	1.208 (0.564 -2.589)	0.627	1.425 (0.608 -3.337)	0.415
Additional work hours per week						
None	31 75.6%	10 24.4%	Reference		Reference	
1-10	92 64.8%	50 35.2%	0.594 (0.269 -1.310)	0.197	0.581 (0.241-1.403)	0.228
More than 10	89 63.6%	51 36.4%	0.563 (0.255 -1.242)	0.155	0.531 (0.217 -1.301)	0.166
Type of ward						
General medical	40 62.5%	24 37.5%	0.627 (0.331 -1.187)	0.152	0.669 (0.335 -1.334)	0.254
ICU	48 68.6%	22 31.4%	0.821 (0.434 -1.552)	0.544	0.835 (0.426 -1.637)	0.599
General surgical	31 50.8%	30 49.2%	0.389 (0.206 -0.734)	0.004*	0.387 (0.194 -.772)	0.007
others	93 72.7%	35 27.3%	Reference		Reference	
Patients require mobilizing						

None	16 64.0%	9 36.0%	Reference		Reference	
1-5	119 63.6%	68 36.4%	0.984 (0.413 -2.348)	0.972	1.207 (0.437 -3.331)	0.716
More than 5	77 69.4%	34 30.6%	1.274 (0.512 -3.168)	0.602	1.513 (0.521 -4.392)	0.446
Gender						
Male	14 66.7%	7 33.3%	1		1	
Female	198 65.6%	104 34.4%	0.952 (0.373 -2.432)	0.918	0.660 (0.214 -2.038)	0.470
Age group						
20- 30 years	136 69.7%	59 30.3%	Reference		Reference	
31-40 years	63 63.6%	36 36.4%	0.759 (0.455 -1.265)	0.291	0.645 (0.356 -1.168)	0.148
Over 40 years	13 44.8%	16 55.2%	0.352 (0.159 -0.779)	0.010*	0.356 (0.148 -.860)	0.022
Smoking						
No	203 66.1%	104 33.9%	1		1	
Yes	9 56.3%	7 43.8%	0.659(0.239 -1.819)	0.421	0.638 (0.195 -2.082)	0.456
Regular Physical activity						
No	146 65.5%	77 34.5%	1		1	
Yes	66 66.0%	34 34.0%	1.024 (0.623 -1.683)	0.926	1.078 (0.621-1.874)	0.789
Feeling low in mood						

Never	47 63.5%	27 36.5%	Reference		Reference	
Occasionally	140 65.1%	75 34.9%	1.072 (0.619 -1.859)	0.803	1.050 (0.489 -2.252)	0.901
Frequently	25 73.5%	9 26.5%	1.596 (0.651-3.913)	0.307	1.388 (0.433 -4.453)	0.581
Feeling under stress						
Never	33 60.0%	22 40.0%	Reference		Reference	
Occasionally	132 65.3%	70 34.7%	1.257 (0.681-2.319)	0.464	1.491 (0.631 -3.523)	0.362
Frequently	47 71.2%	19 28.8%	1.649 (0.773 -3.520)	0.196	1.742 (0.609 -4.982)	0.301

* ***Significant***

Discussion

This study aimed to objectively measure the prevalence of LBP and its risk factors among nurses in Qassim . This research is potentially the first comprehensive analysis of LBP involving four major public health facilities in Qassim. We aimed to measure the prevalence of LBP of nurses during their working life. The study found the prevalence of LBP was 65.5%. The literature shows a wide variation in LBP prevalence. However, the numbers are invariably high as reported in previous intentional studies conducted among nurses in Switzerland [24], Nigeria [25] , Slovenia [26], Jordan [27], and South Africa [28] .Nationally, LBP prevalence was reported as 74.2 % , and 48.4% among operating room staff in Makkah & Taif respectively [29,30] . In addition, a study showed a prevalence of 53.2 % among nurses in Sudayr region [31]. Those findings reflect the burden of LBP among an important healthcare workforce. However, no significant gender-related differences in prevalence were reported. This finding is inconsistent with previous studies that showed a higher prevalence of LBP among females compared to males [25, 32] . Nurses are at the heart of healthcare systems worldwide and have indispensible role in the delivery of healthcare. Our results also showed that 61.8% of nurses who reported LBP had suffered from pain spreading to below their knees and over 38% of them had sought treatment for LBP. In addition, over 31% of nurses in the study reported absence from work due to LBP .This finding is in agreement with

a previous Saudi study indicating that almost 44% of nurses reported considering changing their job due to LBP [33].

In depth analysis of the potential risk factors for LBP, shows that occupation-related back pain is a complex phenomenon and its underlying causes are multifactorial. In the literature A web of causation of LBP was described which includes; demographical factors, lifestyle factors, occupational factors, and psychological factors [34].

Regarding the demographic characteristics and based on the logistic regression analyses, our study found that age had significant different odds for the study participants with LBP when compared with those without LBP. Nurses aged over 40 years were less likely to develop LBP when compared to nurses of younger age. Specifically, they had 64% less likely odds of developing LBP. Our result is in contrast with other studies which show LBP is associated with older age [25, 35, 36]. On other hand, however, this result is supported by past evidence which indicate that younger nurses between 20-30 years had the highest prevalence of LBP [37]. This might be due to the fact that younger nurses are more likely to be involved in heavy workload as healthcare assistants or staff nurses. This type of workload involves assistance mobilizing of patients or instruments and hence requires more musculoskeletal effort. While older, probably senior nurses are expected to be responsible for organizational or supervisory jobs with less musculoskeletal strains. This finding could also be attributed to training. Older nursing staff would have received extensive training on health and occupational safety and had developed awareness and skills on safe posture technique over time and so less likely to adopt faulty postures. Additionally, younger nurses with limited work experience and high job demand may suffer more from psychological stress compared to older nurses who might have already developed effective strategies to cope with work and personal stress. This explanation is supported by a previous study which indicates that younger nurses have higher job-related stress [37]. Another plausible explanation for the decreased odds for LBP among older nurses is the healthy worker effect. LBP sufferers tend to change their employment or quit their jobs, whereas healthy nurses are more likely to stay in their jobs [38].

This study also investigated the effect of life style factors on LBP. Evidence from the literature suggests a strong association between smoking and LBP confirming that smokers are more prone to LBP [39]. It has been found that nicotine significantly decreases the amount of oxygen reaching the muscles resulting in increased likelihood for muscular injury and degenerative changes [40]. Additionally, it is plausible that smoking induces coughing reflexes which may further increase the risk among smokers for LBP. However, no significant effect of smoking could be detected in this study. A previous study showed similar results [41]. Historically, females in the Arab world are less likely to report their smoking habits for cultural reasons. Over 90% of the study participants were females and therefore under-reporting could be the reason why smoking couldn`t be detected as a significant predicator for LBP in this study. Similarly, no significant association was found between physical activity and LBP in this study. Interestingly, past evidence detected that physical exercise such as pilates intervention reduces LBP [42]. Some authors, however, described the relationship between physical activity and LBP as U-shaped, where moderate

increased risk was exclusively found for those engaged in strenuous activities and those living a sedentary lifestyle [43].

Beside their professional duties nurses are expected to assist in other ancillary services such as mobilizing patients or equipment. Five occupation-related risk factors were tested in this study, those were; working hours per week, work duration, additional work hours per week, type of ward and number of patients requiring mobilization. Of those, only the factor “type of ward” remained statistically significant after adjusting for potential cofounders. Prior evidence has shown that LBP prevalence among nurses working in intensive care units was particularly high [44]. Another study showed that nurses working in the Obstetrics and Gynecology had a high prevalence of LBP exceeding 26% [25]. A different study revealed that the prevalence of LBP was higher among nurses working in surgical wards.[45]. Surprisingly, our study found that nurses working in the general surgery ward have 61% less odds for LBP compared to other departments. Surgical nurses are expected to be more exposed to back pain and injuries due to the nature of the work compared to nursing duties in other wards. Examples of risk include working with dependent patients, standing in one position during lengthy surgical operations, holding patient extremities, moving anesthetized patients, lifting equipment, carrying heavy trays, etc . However, nurses working in surgical departments might have already developed better awareness of this particular risk and hence have become well prepared for their jobs. They might have better skills related to body mechanics and ergonomics compared to nurses working in other wards resulting in lower risk among them. Alternatively, the significant association between working in a surgical ward and lower risk for LBP might indirectly be related to the perceived amount of workload in terms of less number of patients, and a shorter hospital stay of patients in surgical wards. In fact, it is not clear from our data the length of work experience in wards for nurses at the time of the study and its relation to the onset of LBP. Nurses typically rotate between wards during their working life and it is difficult to determine the temporal association between the type of ward and development of LBP in this study. Psychological factors were documented by other studies to have significant association with LBP [16,33,34], however stress and low mood were not identified as risk factors of LBP in this study.

Limitations

Our findings have provided an important scientific contribution. It clearly demonstrate that LBP is a highly prevalent health problem among nurses in Qassim..However, our work has two limitations. First, although we were able to study several variables, temporal association could not be established between LBP and significant variables due to the cross-sectional design. Second, response bias could not be excluded since data were collected through self-reporting. The effect of this bias was minimized through the use of closed - ended, and concise answer choices in the study questionnaire. Also, the questions were direct and clearly phrased. In general, despite limitations we believe that our work adds substantially to a growing body of literature on the prevalence of LBP among nurses in Saudi Arabia.

Conclusions

The evidence from this study suggests that LBP is a common occupational health problem among nurses. The high LBP prevalence reported in this study is comparable to other countries. However, targeted interventions are needed to reduce this prevalence. It has been observed that younger nurses who constitute the largest group of the ward team in any hospital are more prone to have LBP. Nurses work in direct contact with patients, and their health not only influences their job satisfaction but also patient safety and quality of healthcare. Interestingly, the results of this study showed that nurses working in general surgery wards where one would expect a heavy workload have lower risk for LBP. In our view, these results have important managerial implications. Improving the workplace environment for nurses is essential to reduce the risk for LBP. Ergonomics research is required to identify evidence-based interventions that would help promote the health and safety of nurses, as well as on-the–job training to raise nurses' awareness and improve their skills on how to use body mechanics and avoid risky postures.

Abbreviations

95% CI: 95% Confidence Interval.

aOR: Adjusted Odds Ratio.

LBP: Low Back Pain

uOR: Unadjusted Odds ratio.

$N=Z^2\ p\ (1-p)\ /\ d^2$

Where:

N: Target sample size

Z: The standard normal variant at 5% type 1 error (p value < 0.05), which is 1.96.

P: Expected prevalence of low back pain among nurses obtained from previously published studies.

D: Absolute error or precision, decided as 5%.

Declarations

Ethics approval and consent to participate

The study has been approved by the Regional Research Ethics Committee under the General Directorate of Health affairs / Ministry of Health in Qassim Province. It has been registered at the National Committee of Bio.& medical ethics in Saudi Arabia (Reference Number: H-04-Q-001) . Participation was voluntary, and a written consent was obtained from participants prior to completing the questionnaire.

Consent to publish

Not applicable.

Availability of data and materials

The datasets generated and analyzed during the current study are not publicly available due to privacy restrictions. Respondents were informed during the consent process that the data they provide would be available only to the research team. Data are however available from the authors upon reasonable request and with permission from the Saudi Ministry of Health.

Competing interests

The authors declare that they have no competing interests.

Funding

No funding was obtained except funding from the Deanship of Scientific Research in Qassim University for publication of this project.

Authors' Contributions

AE was the principal investigator & corresponding author. She participated in the design and protocol review, guided the data analysis, and interpretation, and provided critical revision of the initial drafts of the manuscript. She provided coordination and made a substantial contribution toward finalizing the manuscript. HA, RIA, MA, NA, RKA and SA collaboratively contributed to the conception of the study idea, design, literature review , protocol preparation, data collection, data analysis & interpretation, and wrote initial drafts of the manuscript. All authors have read and approved the manuscript.

Acknowledgements

Researchers would like to thank the Deanship of Scientific Research, Qassim University for funding publication of this project. We would also like to extend our thanks and appreciation to the administrators and nurses from the four hospitals included in this study. Particular thanks to Dr. Alaa Ali AlDahlawi for his support and assistance with data collection. Also, special thanks to Afrah H. AlAzmi, and Mohammed F. AlHarbi for their efforts. Our sincere appreciation extends to all those who have contributed to this work.

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