The impact of physical and psychological job demands on nurses' work-related low back pain: A systematic review and meta-analysis

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ABSTRACT

Introduction: The current review aims to assess the significant predictors of nurses' work-related lower back pain (WrLBP), as there is still a lack of global awareness regarding the causes and prevention of this condition despite significant advancements in methods and tools related to nurses' Work-Related Lower Back Pain (WrLBP) prevention and treatment, such as intervention programs, standards, codes of practice, and guidelines. (i.e. physical job demands, and psychological job demands).

Methods: There are few systematic reviews on the prevalence of nurses' WrLBP in one place; hence, this study was conducted. The overall prevalence of WrLBP among the nurses was evaluated. A systematic search of Google Scholar, MEDLINE, Scopus, PubMed, and Web of Sciences was carried out to retrieve 35 eligible articles published worldwide from 2000 to 2023.

Results: The data was statistically analyzed using the MedCalc® program. The overall pooled prevalence of nurses' WrLBP was (67.051 %, 95%CI: 66.324-67.771; p<0.001). The current review showed a strong significant correlation between Work-Related Lower Back Pain (WrLBP) and physical job demands (P<0.001). Similarly, a meta-analysis of these studies found a significant association between nurses' WrLBP and psychological job demands (P = 0.037).

Conclusion: The study indicated that prevalence data would help in formulating and strictly implementing control measures in hospital areas to reduce the level of nurses' WrLBP. Wherever the current study results suggest the potential relevance of constantly assessing nurses for psychological and physical symptoms in order to enhance their knowledge of WrLBP and lower their likelihood of WrLBP

Keywords: Nurse, Physical Job Demands, Psychological Job Demands, Work-Related Lower Back Pain

Introduction

Musculoskeletal Disorders (MSDs) are becoming increasingly prevalent worldwide, especially among healthcare professionals and nursing personnel.[1-7] Work-related lower back pain (WrLBP) is a relatively frequent MSD among nurses, and it is of significant concern.[4,8-12] However, to satisfy the needs of patients rapidly, nursing is a demanding career for developing back illnesses, which have an elevated prevalence rate.[13] Likewise, a systematic review demonstrated that lifting in inappropriate and forward-bent positions was a particularly risky nursing duty that led to a number of documented MSDs.[14] Furthermore, nurses spend the majority of their career time with patients, providing proper healthcare services and most handling

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patients duties are seen as high-risk based on the weight that is lifted, size, and uncomfortable positions used by nurses in providing healthcare.[11,15,16] This is the fact that caring for people is viewed as a risky task and it is related to high MSD complaints, mostly high prevalence of back pain.[1,4,17-19]

Therefore, reducing nurses' back pain is very important due to that it may produce nurses' physical suffering, early retirement, and more absenteeism.[1,20] Thus, the present review chose to study nurses because well-designed work environments are not only crucial for nurses but may also indirectly affect their patients.[21-23] The current study contributes to the body of knowledge by looking at particular risk indicators for nurses' WrLBP which end up in inconsistent outcomes. Previous studies on nurses' WrLBP indicated a gap between nurses' WrLBP and the physical and psychological demands of the job. The study's findings may also assist decision-makers, especially those in hospitals that directly oversee healthcare services, in understanding the risk factors associated with long-term pain. It would also assist legislators in modifying this risk factor to lessen the WrLBP that nurses experience.

Work-Related Lower Back Pain (WrLBP)

In 2016, WrLBP was the fifth leading cause of Years Lived with a Disability (YLDs) in all countries [24]. It was the most common non-communicable/non-fatal disease leading cause of YLDs, with the highest age-standardized rates in 133 countries for men and 104 countries for women, including high-income countries in different regions, therefore, research is needed to understand predictors of WrLBP across different settings and prevent and manage WrLBP better.[24-27] Several factors influence an individual's likelihood of experiencing WrLBP, such as work-related activities like awkward postures, heavy lifting, and repetitive movements, as well as psychological and psychosocial factors.[28,29] Furthermore, the research discovered a high association between staffing shortages and the risk of nurses' WrLBP occurring.[30-33] Furthermore,

improper conditions at work such as excessive job demands, inadequate workplace control, and inadequate social support maximize job stress and could result in adverse health effects and accidents, as well as carrying the greatest likelihood of diseases for instance MSDs.[34,35,36]

Broadly speaking, the etiological mechanisms of MSDs are still poorly understood, However, the body of literature has emphasized the three different types of risk factors that may contribute to the development of MSDs. These include personal factors, physical activity factors, and psychosocial factors.[37] However, risk factors for WrLBP may generally be divided into two primary groups: personal and work-related risk factors.[38] Work-related risk factors, which include two subgroups: physical and psychological variables, serve as reliable determinants of nurses' WrLBP.[39] Thus, the current study will highlight both physical and psychological job demands factors as the main predictors of nurse WrLBP.

Physical Job Demands

Multiple research studies demonstrated a strong and highly significant relationship between physical job demands and nurses' WrLBP.[33,34] However, physical job demands relate to any physical needs at work, such as moving or carrying large weights, quick and frequent physical activity, and uncomfortable postures, which might result in strain (i.e. WrLBP).[40] For example, according to a comprehensive study, patient handling responsibilities appear to be the most important risk for WrLBP among nurses, where Jobs with higher physical demands frequently have a higher prevalence of reported low back conditions.[41,42,43] Moreover, controlling physical task demands at work may not only assist in lowering the dangers of the WrLBP, but also lessen workers' desire to make claims.[40] Thus, as previously discussed, physical job-related demands have been chosen as a factor in the present review.

Psychological Job Demand

Psychological job demand relates to the workload, institutional restrictions, and mental condition

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encountered by someone who works to carry out his or her task and meet multiple demands.[44] Psychological job demand is known as one of the most critical risk factors for various measures of WrLBP in the nursing profession.[45] Therefore, psychological job demands affect the risk of a back injury, severity, and healing process.[29,39] Thus, according to the previous discussion, psychological job demands were selected as an independent variable; therefore, the current review considered job demand factors, namely psychological and physical job demands. Current systematic reviews and meta-analyses, which are typically the best sources of information to enhance knowledge and understanding of the causes and prevention of WrLBP among nurses globally, are the most effective ways to synthesize research data on WrLPB among nurses. Systematic reviews may be a useful tool for hospital managers to make decisions that will improve nursing safety, which is essential to deliver high-quality nursing treatment. The advantages of providing safe and healthy conditions for nurses will also benefit the hospital. The current meta-analysis is being utilized to establish statistical significance for WrLPB among nurses in studies with inconsistent results. Furthermore, an in-depth review of the literature provides occupational health and safety experts with a thorough grasp of WrLPB among nurses.

Methods

Search strategy and guidelines

The PRISMA 2020 guidelines was used to conduct the current study and checklists as shown in Figure 1. which were created to assist authors in clearly disclosing the rationale behind their systematic review, the techniques employed, and the results obtained.[46] Google Scholar, MEDLINE, Scopus, PubMed, and Web of Sciences were utilized to obtain the dataset. The authors reviewed cross-sectional studies on the prevalence of WrLBP and correlated physical and psychological job demands. The study focused on an organized review of articles published between 2000 and 2023, in English, peer-reviewed, and

online journals that discussed the correlation between the WrLBP and psychological and physical job demands among nurses.

Inclusion and exclusion criteria

The review includes all cross-sectional, population-based studies that assessed the relationship between work-related low back pain and job demands. The relationship was assessed using the Job Content Questionnaire (JCQ), which was designed for assessing workplace strain, social support, physical demands, decision latitude, and psychological demands.[34] The physical job demands examined in the studies that were included were the physical needs at work such as moving or carrying large weights, quick and irregular physical activity, and uncomfortable postures, while psychological job demands include challenging patients, perceived work pressure, heavy workload, duties, commitment to work, mental or emotional burden, encounter with discomfort, and death.[14,28,29,40] The current review included studies that have been published widely in English and measured the prevalence and correlation between WrLBP and physical and psychological job demand in terms of p values. Excluded criteria included, editorials, letters to the editor, review articles case reports. Studies that had an uncertain relationship with any of the above were also excluded.

Data identification and extraction

To fulfill the study's aims, data extraction from studies on prevalence and associated variables was updated and adjusted. The author's first name, the study's title, the year it was published, the country of source, the sample size, the frequency or prevalence of the certain sample, gender groups, and risk factors for each study that was initially evaluated were all included in a suitable checklist that was customized for the study. After carefully reviewing the entire texts of the remaining articles from the previous level, studies that did not match the inclusion and exclusion criteria were discovered. Two authors used and adapted Downs and Black's criteria to assess the quality of the research.[47] Each article was assessed, and a

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score was allotted based on a 10-item scale.

Data analysis

The meta-analysis was conducted using MedCalc® Statistical Software version 22.013. The prevalence rate of nurses' WrLBP in the included studies was calculated using both the Random-Effects (RE) and Fixed-Effects (FE) models. The relevant data from each article were extracted, including adaptive positive cases and sample sizes. The data were then examined with the software, and the FE model was chosen based on the assumption of consistency among the included research. This method ensured that the pooled estimate represented the overall population's effect size. The prevalence of WrLBP among and associated job demand factors, namely psychological and physical job demands were reviewed to predict correlation among the included articles. I2 statistics were employed to assess the study's heterogeneity. If the level of heterogeneity was more than or equal to 75%, a RE model was utilized to analyze the data. A Fisher Z transformation was used to analyze the association between WrLBP and both psychological and physical job demands, with significant results ($P<0.05$).
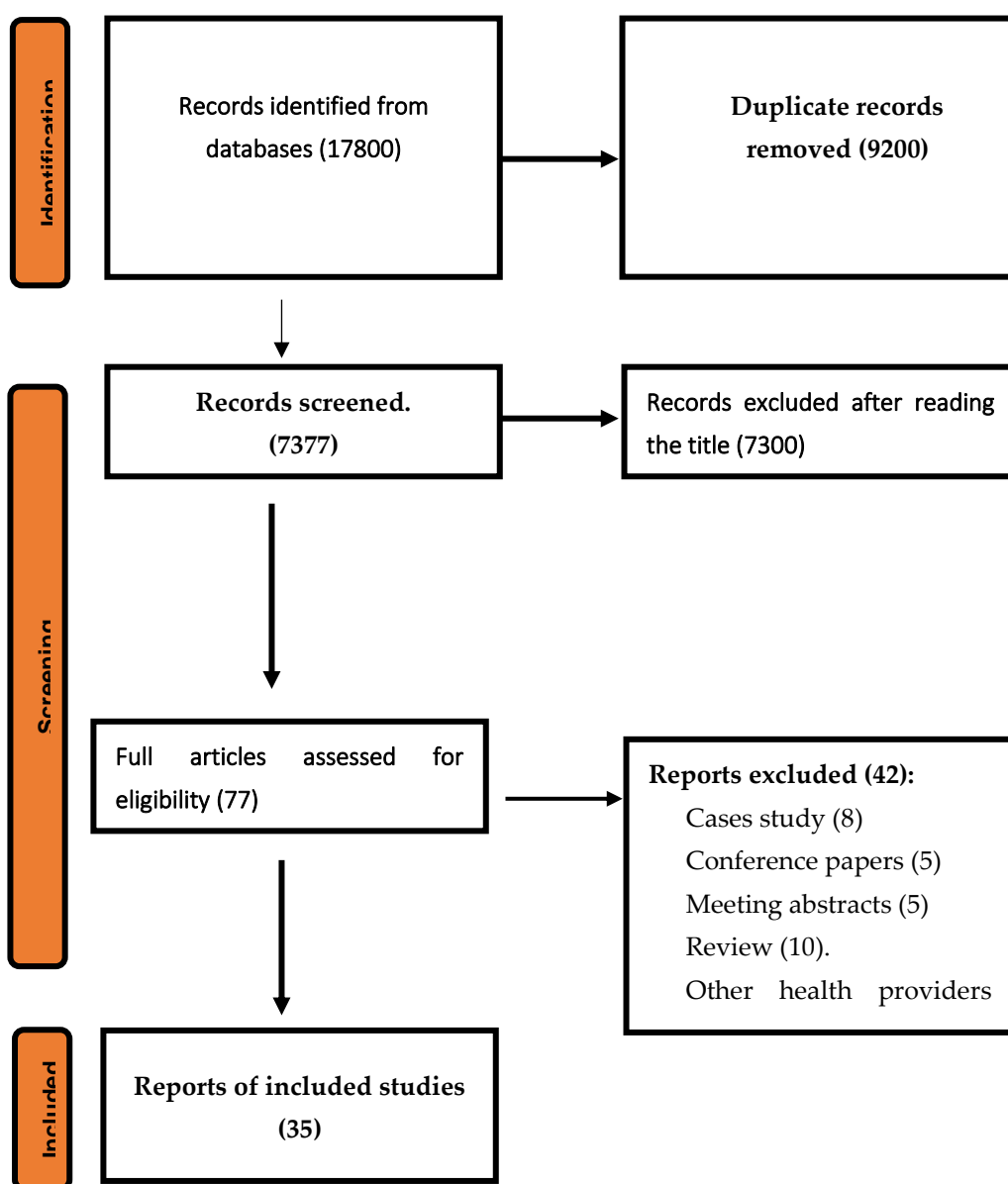

Figure 1. Identification of studies retrieved in this review

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Results

The first scanning discovered 17800 articles, of which 10423 were deleted because of duplication and other automated technologies. Seventy-seven studies were assessed for their eligibility to evaluate the significant predictors of nurses' WrLBP. The meta-analysis comprised 35 papers after excluding 40 articles that did not match the inclusion criteria, as shown in Figure 1.

Table 1 shows the included research from 21 countries. The publication years were 2000-2023, and the cumulative sample size of the research was 17640 participants, aged 18 to 69 years.

Table 1. Characteristics of the included cross-sectional studies.

First Author Name-Year	Country	Sample Size	WrLBP Prevalence (%)	Physical Demand (P value)	Psychological Demand (P value)	Age Range (years)
Choobineh et. Al 2006 [43]	Iran	641	54.90%	0.001	0.003	22-66
Yip 2004 [48]	Hong Kong	144	39.00%	0.05	0.06	29.91
Golabadi et.al 2013 [49]	Iran	587	58.50%	0.00	0.002	32.1
Barzideh et.al 2014 [35]	Iran	385	61.80%	0.002	0.0002	22–56
Feng et.al 2007 [45]	Taiwan	244	66.00%	0.004	0.001	43.3
Smith et.al 2004 [8]	China	206	56.70%	0.0013	0.0058	30-35.5
Habibi et.al 2012 [50]	Iran	844	89.10%	0.035	0.0	22-52
Mohseni-Bandpei et.al 2006 [51]	Iran	1300	62.00%	0.001	0.001	22-57
Rahmah et.al 2008 [39]	Malaysia	126	50.00%	0.043	0.555	NA
Chang et.al 2016 [52]	Malaysia	141	63.10%	0.36	0.37	20-56
Cheung et al 2006 [53]	Hong Kong	411	71.20%	0.05	<0.05	NA
Trinkoff et. al 2003 [54]	USA	1163	NA	0.00	0.002	NA
Choobineh et. Al 2021 [55]	Iran	495	69.90%	0.609	0.022	31.3
Byrns et.al 2004 [56]	USA	270	69.50%	0.001	0.001	21-69
Ibrahim et.al 2019 [57]	Malaysia	1292	76.50%	0.597	<0.05	25-60
Yokota et al 2019 [58]	Japan	765	64.60%	0.017	0.002	33
Raeisi et.al 2014 [59]	Iran	532	59.50%	0.001	NA	32.4
Heiden et.al 2013 [60]	Germany	273	8.70%	0.003	NA	21-63
Almaghrabi et.al 2021 [61]	Saudi Arabia	234	82.90%	0.03	NA	30-40
Jradi et.al 2020 [62]	Saudi Arabia	410	79.50%	0.003	0.001	NA
Abbas et.al 2010 [63]	Saudi Arabia	937	61.50%	0.00	NA	30-49
Sorour et.al 2012 [64]	Egypt	58	63.80%	0.01	0.01	18-53
Louna et.al 2023 [65]	Syria	156	57.70%	0.011	0.021	20-60
Nasaif et. Al 2022 [66]	Bahrain.	550	72.30%	0.001	NA	31-40
Algethami et. Al 2023 [67]	Saudi Arabia	85	42.40%	0.025	NA	36-45
Mekonnen 2017 [68]	Ethiopia,	418	63.60%	0.001	0.068	25-35
Kazemi et.al 2023 [69]	Iran	402	86.30%	0.84	0.02	24-56
El-Soud et.al 2014 [70]	Egypt	150	79.30%	0.01	NA	NA
Rathore et.al 2017 [71]	Pakistan	117	32.00%	0.001	NA	32-62
Skela et.al 2017 [72]	Solovenia	1498	85.90%	0.001	0.003	40.8
Sikiru et.al 2010 [73]	Nigeria	408	73.53%	0	NA	NA
Dlungwane et.al 2018 [74]	South Africa	242	59.00%	0.002	NA	20-50
Gautam et.al 2019 [75]	Nepal	110	64.50%	0	NA	20-50
Doda et.al 2020 [76]	Indonesia	162	77.00%	0.05	0.003	NA

First Author Name-Year	Country	Sample Size	WrLBP Prevalence (%)	Physical Demand (P value)	Psychological Demand (P value)	Age Range (years)
Suliman 2018 [77]	Jordan	384	69.00%	0.65	NA	32.59
Rezaee et.al 2014 [78]	Iran	1246	46.23%	0.024	NA	20-61
Abolfotouh et.al 2015 [26]	Qatar	254	54.30%	0.005	NA	34.6
All		17640				18-69
NA: Not Available						

Overall Prevalence of WrLBP among nurses

In the current review, the included studies indicated that 67.051% of nurses experience WrLBP as a pooled prevalence of WrLBP as demonstrated in Table 2. Nearly 37.14% of the examined studies (n = 13) indicated a significantly higher prevalence of nurses' WrLBP, while 62.86% (n = 22) showed a prevalence that was lower than the pooled predicted prevalence. The study indicated that the greatest nurses' WrLBP prevalence (89.100%, 95% CI: 86.8-91.122) was done among Iranian nurses [50], with a mean age of 22-52 years, while the smallest prevalence study was among German nurses aged 21-63 years, with nurses' WrLBP prevalence of (8.791%, 95%CI: 5.714-12.798).[60]

Table 2. Pooled prevalence of WrLBP in Nurses

First Author Name-Year	Country	Sample size	Proportion (%)	Confidence interval 95% CI	Weight (%)
Choobineh et. Al 2006 [43]	Iran	641	54.914	50.969 to 58.814	3.93
Yip 2004 [48]	Hong Kong	144	38.889	30.885 to 47.360	0.89
Golabadi et.al 2013 [49]	Iran	587	58.433	54.327 to 62.454	3.60
Barzideh et.al 2014 [35]	Iran	385	61.818	56.759 to 66.694	2.36
Feng et.al 2007 [45]	Taiwan	244	65.984	59.667 to 71.906	1.50
Smith et.al 2004 [8]	China	206	56.796	49.732 to 63.662	1.27
Habibi et.al 2012 [50]	Iran	844	89.100	86.800 to 91.122	5.17
Mohseni-Bandpei et.al 2006 [51]	Iran	1300	62.000	59.298 to 64.647	7.96
Rahmah et.al 2008 [39]	Malaysia	126	50.000	40.965 to 59.035	0.78
Chang et.al 2016 [52]	Malaysia	141	63.121	54.593 to 71.085	0.87
Cheung et al 2006 [53]	Hong Kong	411	71.290	66.651 to 75.618	2.52
Trinkoff et. al 2003 [54]	Iran	495	69.899	65.647 to 73.912	3.03
Choobineh et. Al 2021 [55]	USA	270	69.630	63.765 to 75.057	1.66
Byrns et.al 2004 [56]	Malaysia	1292	76.471	74.060 to 78.760	7.91
Ibrahim et.al 2019 [57]	Japan	765	64.575	61.069 to 67.968	4.69
Yokota et al 2019 [58]	Iran	532	59.586	55.279 to 63.787	3.26
Raeisi et.al 2014 [59]	Germany	273	8.791	5.714 to 12.798	1.68
Heiden et.al 2013 [60]	Saudi Arabia	234	82.906	77.459 to 87.498	1.44
Almaghrabi et.al 2021 [61]	Saudi Arabia	410	79.512	75.276 to 83.316	2.51
Jradi et.al 2020 [62]	Saudi Arabia	937	61.473	58.271 to 64.602	5.74
Abbas et.al 2010 [63]	Egypt	58	63.793	50.118 to 76.008	0.36
Sorour et.al 2012 [64]	Syria	156	57.692	49.535 to 65.552	0.96
Louna et.al 2023 [65]	Bahrain.	550	72.364	68.422 to 76.063	3.37
Nasaif et. Al 2022 [66]	Saudi Arabia	85	42.353	31.701 to 53.554	0.53
Algethami et. Al 2023 [67]	Ethiopia,	418	63.636	58.822 to 68.257	2.56
Mekonnen 2017 [68]	Iran	402	86.318	82.567 to 89.524	2.46

First Author Name-Year	Country	Sample size	Proportion (%)	Confidence interval 95% CI	Weight (%)
Kazemi et.al 2023 [69]	Egypt	150	79.333	71.967 to 85.505	0.92
El-Soud et.al 2014 [70]	Pakistan	117	31.624	23.339 to 40.865	0.72
Rathore et.al 2017 [71]	Slovenia	1498	85.915	84.049 to 87.638	9.17
Skela et.al 2017 [72]	Nigeria	408	73.529	68.965 to 77.749	2.50
Sikiru et.al 2010 [73]	South Africa	242	59.091	52.610 to 65.347	1.49
Dlungwane et.al 2018 [74]	Nepal	110	64.545	54.854 to 73.433	0.68
Gautam et.al 2019 [75]	Jordan	384	69.010	64.121 to 73.604	2.35
Doda et.al 2020 [76]	Iran	1246	46.228	43.431 to 49.043	7.63
Suliman 2018 [77]	Qatar	254	54.331	47.988 to 60.571	1.56
Rezaee et.al 2014 [78]		16315	67.051	66.324 to 67.771	100.00
Abolfotouh et.al 2015 [26]	P < 0.0001				
I² (inconsistency)	98.10%				

Impact of job demands on WrLBP

All of the included studies indicated a work-related factor for nurses' WrLBP in terms of physical and psychological job demands. The current review found a significant correlation (P<0.001) between the nurses' physical job demands and their WrLBP (Figure 2). Some of the included studies showed the highest significance between WrLBP and physical job demands (*P =0.00*),[48,53,62,72,74] in comparison to other groups showed no significance between the two variables.[51,54,68,76]

The results of 20 studies that explored the relationship between WrLBP and psychological demands are presented in Figure 3. A meta-analysis of these studies revealed a significant correlation between the two variables (P = 0.037). One included study showed the highest significance between WrLBP and psychological job demands (*P =0.00*) in comparison to other groups showed no significance between the two variables .[39,49,51,67]
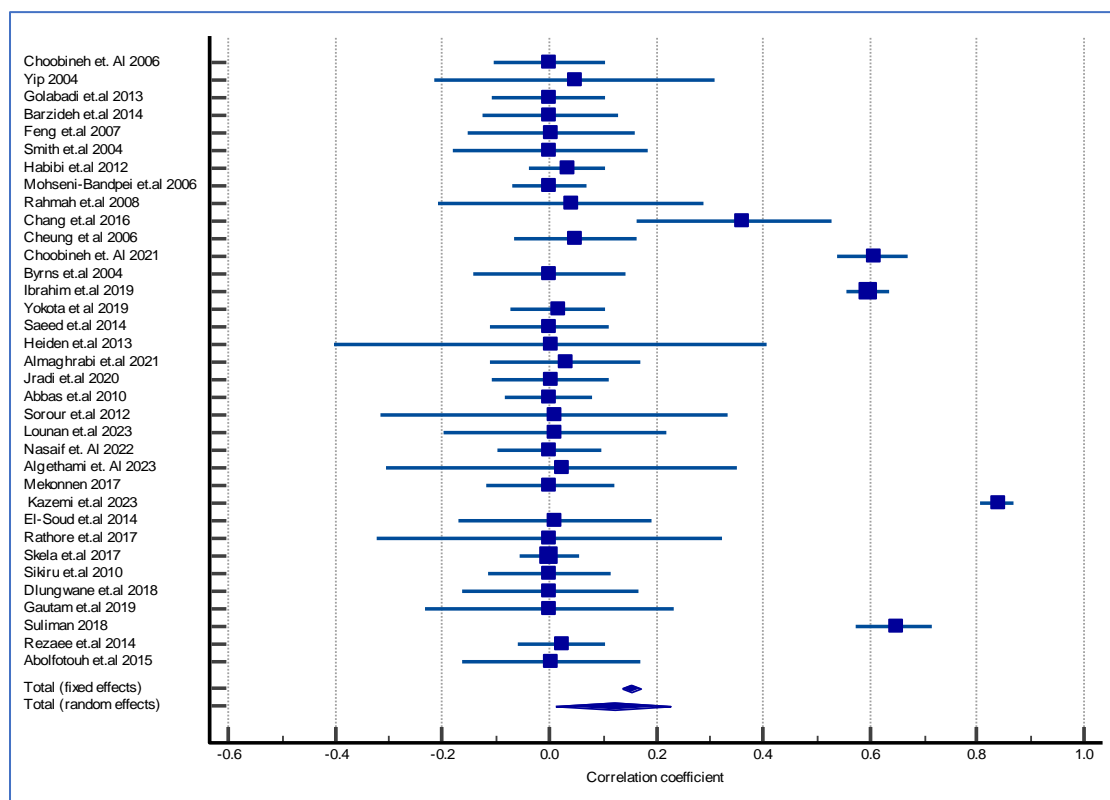

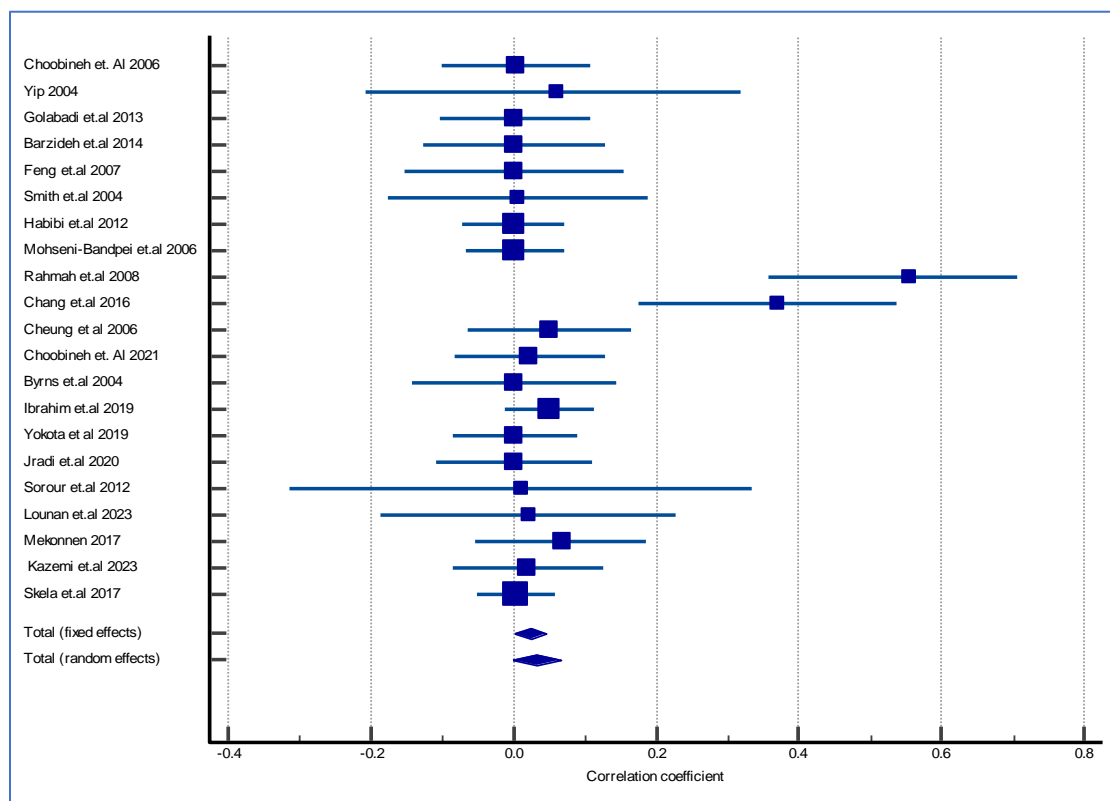**Figure 2. Forest plot of the correlation between WrLBP and physical job demands (*P< 0.001*).**

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Figure 3. Forest plot of the correlation between WrLBP and psychological job demands (P=*0.037*)

Discussion

WrLBP is a highly frequent MSD among nurses and is of great significance.[12,24,27,42,45] WrLBP is a worldwide health concern and one of the top five causes of YLDs in all nations, and is the most frequent non-communicable/non-fatal condition that leads to YLDs, including high-income nations in different regions.[24-27] However, jobs with higher physical demands typically have a higher prevalence of claimed low back conditions,[42] and psychological job-related demands appear to be among the main risk factors associated with different indicators of WrLBP in the nursing profession.[45]

In the current meta-analysis, between 2000 and 2023, the pooled prevalence of WrLBP was 67.051% (95% CI: 66.324-67.771; p < 0.001). Iranian study found the greatest WrLBP prevalence (89.100%, 95% CI: 86.8-91.122) among nurses aged 22-52 years, whereas German stay found the lowest prevalence (8.791%, 95% CI: 5.714-12.798) in nurses aged 21-63 years.

The review found a significant relationship between nurses' physical job demands and their WrLBP (P<0.001). Specifically, when nurses believed that they had high physical job demands, which included frequent periods of physical exertion, moving or carrying very large loads, quick and constant movement, and physically uncomfortable postures, they would develop WrLBP. Similarly, a meta-analysis of these studies found a significant relationship between psychological job demands and nurses' WrLBP (P = 0.037). Exactly, when nurses reported that they faced severe psychological job demands, which involved working extremely rapidly, performing very hard tasks, and performing excessive amounts of work, they would have WrLBP.

In the present analysis, one reasonable cause of the strong significant correlation (P < 0.0001) between LPB and both physical and psychological job demands is that severe injuries to the back area caused by high job demands activities such as lifting heavy objects or patients, where carrying heavy items or patients is the most important reason causing WrLBP among nurses, those who perform such activities while unsuccessful to consider proper body mechanics. And their back health has seen more WrLBP as a result.[8,79]

The total sample size of the included studies in the

present review was 17640 nurses. The results of the current review suggest that there is no clear relationship between the study's sample size and the prevalence of WrLBP among nurses. Stated differently, the biggest sample size study 72 with 1498 staff nurses revealed a prevalence of WrLBP of 85.90%, which is lower than the maximum prevalence study (89.10%) 50. The study with the smallest sample size 64, which comprised 58 staff nurses, revealed a WrLBP prevalence of 63.80% which is higher than the minimum prevalence study (8.70%) 60.

Uncontrolled WrLBP has a huge impact on people, their relationships, their communities, authorities, and organizations all over worldwide.[80] Furthermore, WrLBP is a globally expensive health concern, and therapies are frequently ineffective.[81] Additionally, work-related WrLBP threatens both workers in heavy manual jobs and in lighter jobs [82]. Moreover, Clark and Horton reported that WrLBP has an impact in all age groups; also, they reported that WrLBP mostly might be related to low socioeconomic status, smoking, and obesity.[83] Thus, WrLBP resulting from occupational exposures at work is a substantial cause of disability, therefore there is an urgent need for expanded knowledge on WrLBP connection hazards, particularly in countries that are developing.[84]

Research Implications

The current systematic review delivers a significant and important practical contribution to the domain of knowledge in the safety field, and the ergonomic field (i.e., MSDs field, specifically WrLBP literature) and to the limited review research on the effects of job demands (i.e., physical and psychological job demands) on nurses' WrLBP.

The finding of the present review provides significant implications for hospital managers to improve nursing safety. First, since job demands (i.e., physical and psychological job demands) are the important factors influencing nurses' WrLBP in the hospitals, these determinants must be known as serious factors with high consideration

by hospital directors in redesigning the rules, guidelines, and regulations, and practices. Thus, to reduce nurses' WrLBP, reducing physical and psychological job demands should be given major attention. In line with the prior studies demonstrating that a good state of psychological and physical health of nurses was a prerequisite condition for delivering a proper quality of nursing healthcare, hospital management could reduce the burden from both physical and psychological job demands by raises attention amongst policymakers in hospitals and other healthcare facilities to consider the importance of new strategies in absorption of both physical and psychological job demands, that would participate in the reduction of WrLBP as one of the MSDs (i.e., ergonomic risk) in the healthcare context.[20,85]

However, from a job redesign perspective, and as a part of non-pharmacological intervention to reduce WrLBP among nurses, we suggest that hospital management should increase the frequency of nurses' involvement and engagement in designing/redesigning (job crafting) and implementing proper hospital safety programs, discussion on safety issues (i.e., WrLBP) in meetings with hospital management and investment in nurses' safety training regarding such MSDs in the hospital in the form of a bottom-up approach to reduce nurses' WrLBP. Whereas hospitals can acquire benefits in the form of healthy nurses in safe environment

Suggestions for Future Research

Future longitudinal studies are recommended to replicate the current review from the hospital and the nurses' manager's perspective and compare it with staff nurse responses. This might aid in clarifying the gap between hospital management's view (Traditional Top-Down approach) on job demands and those of workers (Bottom-Up approach), which helps in providing hospital management the basis for job redesign initiated by the workers.[86]

Moreover, based on the limitations of the present review, whereas the current review mainly

focused on the job demand dimension of Job Demands-Resources (JD-R) theory, which proposed that job demands were the unique predictors of exhaustion [21, 34], it underlines that job demands including these involve constant physical effort linked with particular physiological consequences [85,87], numerous upcoming research directions could also look into how job recourse (the second dimension of JD-R theory) can affect nurses' WrLBP.[21,34,85,87] Thus, research is recommended to add further empirical proof in the ergonomic literature (i.e., MSDs/WrLBP literature) to review job resources (i.e. job control, social support, staffing adequacy, …etc.) as determinants factors of nurses' WrLBP, as increasing in job resources will reduce the level of WrLBP among nurses.[88] However, further research is required to examine the effectiveness of several preventative approaches in decreasing the prevalence of WrLBP among nurses including cultural differences' impact on WrLBP.

Conclusions

The current study effectively addressed the worldwide prevalence of nurses' WrLBP and its correlations with job demands (physical and psychological) in hospitals. Altogether, the current review has delivered further empirical proof in the ergonomic literature (i.e., MSDs/WrLBP literature) regarding physical and psychological job demands as determinant factors of nurses' WrLBP. Despite there have been several studies that examined nurses' WrLBP, the present review emphasizes the prevalence of WrLBP among nurses. The current review results highlight the potential relevance of frequently screening nurses for both physical and psychological signs in order to raise their knowledge of WrLBP and lower their risk of WrLBP.

The finding of the present study provides significant implications for hospital managers to improve nursing safety. Since job demands (i.e.,

physical and psychological) are the important factors influencing nurses' WrLBP, these determinants must be known as serious factors with high consideration by hospital directors in redesigning the rules, guidelines, regulations, and practices as well as by nurses involving in such as proper hospital safety programs, discussion on safety issues (i.e., ergonomic risk) in meetings and investment in nurses' safety training regarding such MSDs to reduce nurses' WRLBP, as a good state of psychological and physical health of nurses was a prerequisite condition for delivering a proper quality of nursing healthcare and hospital can acquire benefits in the form of healthy nurses' with safe environment. This would reduce compensation costs, lower employee turnover, reduce the insurance premium, reduce lost time, and provide efficient and motivated nurses and consequently, improve hospitals' productivity and performance.

Limitations

The current review primarily examined the job demand dimension of JD-R theory, which focuses on the psychological and physical job demands. Other future review studies may examine the relationship between job recourses, the second dimension of JD-R theory, and nurses' WrLBP, including job control, social support, staffing adequacy, and other factors. Furthermore, other future review studies can include more personal characteristics, such as gender, Body Mass Index (BMI), and smoking. Moreover, as MSDs within nurses affect multi-body regions (e.g., Low Back Pain (WrLBP), neck, shoulders, and hands/wrists) other future review studies can include it. Finally, MSDs pain in the nursing profession has been widely investigated, with more focus on WRLBP, future review studies can include other health professionals such as doctors, physiotherapists, occupational therapists, dietitians ,social workers, and other non-health professionals.

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