


Prevalence obesity and influencing factors among nurses in China: Systematic review

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ABSTRACT

Background: Obesity is a global health problem, and since nurses are health promoters, they, too, are not shielded from this scourge. This systematic review will attempt to determine the current status of obesity, occupational risk factors, lifestyle practices, and demographic variance among the nurses of the global community.

Objectives: This systematic review assesses the prevalence of obesity among nurses and identifies key risk factors, including occupational, socio-demographic, and lifestyle factors, contributing to obesity in this population.

Methods: This work followed the preferred reporting items for systematic reviews and meta-analyses guidelines with 42 papers incorporated in the systematic review after the search of the relevant databases. Screening criteria were developed based on the studies that reported the prevalence of obesity in the nurses' samples, and standardized anthropometric measurements were used. Information was then gathered to estimate and document the worldwide prevalence of obesity and develop the risk factors.

Results: The global pooled prevalence of obesity in nurses was determined to be 32.4%, and it varies within the regions and is concerned with the socio-demographic factors of the population. Some of the factors that were found to have a higher prevalence of obesity include nurses, shift workers, people with chronic occupational stress, and those who use food as a way of dealing with their emotions. Therefore, the study established that age, gender, ethnicity, and SES were significant predictors of obesity, and its associated risks were higher among older and female nurses, ethnic minorities, and nurses of lower SES.

Conclusion: This review acknowledges the complex interplay between occupational, lifestyle, and socio-demographic factors that contribute to the risk of obesity among nurses. Factors such as stress, stress-induced eating, irregular working hours, and limited physical activity significantly increase obesity rates. Additionally, socio-demographic characteristics, such as older age and minority ethnic backgrounds, further elevate the risk of obesity among nurses.

Keywords: overweight, obesity, socio-demographic disparities, nurse health interventions

INTRODUCTION

Obesity is a complex and global problem of significant concern and is defined as the adipose tissue mass over the required amount that is detrimental to human health. As defined by the World Health Organization (WHO) [1-3], obesity as a BMI greater than or equal to 30 kg/m², while being overweight is a state of affairs where the BMI is between 25 and 29.9 kg/m². Obesity is not just a cosmetic issue. It is a medical condition that is linked with several diseases and reduced life span. In 2016, the WHO reported that the global prevalence of obesity had nearly tripled between 1975 and 2016 [2]. Over 1.9 billion adults aged 18 years and above were overweight, and more than 650 million were obese worldwide. According to the latest report from the WHO in 2022, the global prevalence of obesity includes more than 1 billion individuals, comprising

650 million adults, 340 million adolescents, and 39 million children [3]. These figures show the level of obesity, and the trend of the obesity increase only.

Obesity represents a major public health issue globally, with increased incidence and mortality rates. Being overweight or obese is a primary risk factor for chronic diseases [4, 5]. Excess weight significantly increases the risk of contracting diseases, such as arterial hypertension, dyslipidemia, type 2 diabetes, coronary heart disease, cerebrovascular disease, steatohepatitis, musculoskeletal diseases, cholelithiasis, polycystic ovary syndrome, sleep apnea syndrome, and certain types of tumors [4-7]. According to the International Agency for Research on Cancer, obesity is a risk factor for esophageal cancer, colorectal cancer, rectal cancer, kidney (renal cell carcinoma), breast cancer (postmenopausal women), and endometrial cancer [2]. Overweight and obesity accounted for

approximately 3.9% of all cancer cases, with approximately 370,000 cases in women and 180,000 in men [8]. Besides, female fertility has been shown to be significantly impacted by obesity. Adiposity specifically has been demonstrated to impair oocyte development and expansion, ultimately preventing pre-implantation embryo growth [9]. In addition, obesity increases a person's risk of developing severe COVID-19 during the COVID-19 pandemic. Overweight individuals had a 1.84-fold higher chance of getting severe COVID-19 than people with a normal body weight [10].

Obesity is becoming a significant issue that is not only affecting the lives of people but also the health and economic consequences that affect the healthcare sectors, economy, and societies. The financial burden of obesity includes medical treatment for obesity-related illnesses, healthcare expenditures, and indirect costs associated with diminished productivity and absenteeism due to illness. In the USA only, the total cost of chronic diseases due to obesity and overweight is \$1.72 trillion, which is equivalent to 9.3% of the US GDP, counted for 47.1% of the total direct and indirect costs of chronic diseases in the USA [11]. In the same regard, obesity is a significant economic concern worldwide, and it has been estimated that it could be responsible for 2%-7% of total healthcare costs in developed countries [12]. Apart from the economic implications, obesity has social and psychological implications like prejudice, prejudice, and poor quality of life that add to the difficulties of the condition experienced by affected individuals.

Obesity Among Healthcare Professionals: A Paradox

The obesity problem is not isolated from healthcare professionals, especially nurses, in the current world. Ironically, the personnel who are supposed to improve the general public's health and deal with patients who have weight-related complications are at equal risk of being obese. The nursing profession is the most significant component of the healthcare sector. It is involved in a wide range of duties that include providing care to patients and promoting and preventing diseases. Nevertheless, by being at the frontline in promoting health improvement for communities, many nurses struggle to enjoy healthier lives themselves, with concerns such as obesity affecting them more than other people. A study indicates that the obesity rate among healthcare professionals, particularly nurses, is equal to or exceeds that of the general population.

It is quite thought-provoking that healthcare providers are challenged by the same health problems that they are supposed to prevent in their patients; the two questions regarding structural and personal factors of nurses' obesity arise. Several deleterious unhealthy lifestyle behaviors are linked to the nursing profession, which is different from other professions due to physical and emotional demands. Nurses often work long shifts, irregular hours, and in highly stressful environments, all of which can contribute to poor dietary habits, physical inactivity, and chronic stress—key risk factors for obesity. Furthermore, the nature of nursing work, which involves physically demanding tasks such as patient lifting and prolonged standing, may make weight management challenging.

Many studies indicate the importance of nurses in healthcare systems. However, there is a limited amount of research on the health of nurses and their obesity compared to the general population [13]. This lack of attention is quite

worrisome, considering the role that obesity plays in the nurses' health, effectiveness in their duties, and the quality of care they offer. Research has also indicated that obese healthcare workers such as nurses have higher rates of chronic diseases, absenteeism, and reduced physical dexterity that may make them unfit for duty. Moreover, there is a social implication whereby obesity reduces the nurse's credibility in health education and counseling since patients are reluctant to listen to advice from a health professional still struggling to shed some pounds [14].

Implications of Obesity in Nurses

The effects of obesity on nurses are manifold and have repercussions on their lives and job descriptions. In the same regard, nurses who are obese are equally prone to the general diseases that affect the population, such as cardiovascular diseases, hypertension, dyslipidemia, type 2 diabetes, and metabolic syndrome, as highlighted in [15]. These conditions affect the quality of life and lead to decreased physical activity, sick days, and early retirement because of bad health. Some of the nursing working conditions, such as lifting of patients, prolonged standing, and walking, increase obesity-related health risks that include musculoskeletal disorders and physical exhaustion [16].

However, obesity in nurses does not only affect the health of the nurses but also their professional lives. Obese nurses may have more challenges undertaking physical activities considered part of the nursing profession, including lifting patients and standing for extended periods [17]. This could result in reduced efficiency and, in extreme cases, the inability to work on some tasks that are assigned to individuals, thus leading to job contentment and burnout. Moreover, obese nurses lead to stigmatization and discrimination in workplaces that can impact their psychological well-being, organizational satisfaction, and promotion [18]. The current state of the healthcare approach to obesity is stigmatizing, and this, in effect, leads to feelings of isolation, low self-esteem, anxiety, and depression that may lead to more unhealthy behaviors and weight gain.

It has also been postulated that nurses' health behaviors and body weight determine the credibility and outcomes of their health education and patient counseling [19]. Patients might not be willing to take health advice from a nurse who is deemed to be overweight or obese, and this is a poor quality indicator. This phenomenon, known as 'weight bias,' has been discussed in the literature for a long time, and patients are less likely to follow the advice of a doctor who does not fit what they are being prescribed. Since nurses play such a strong part in health promotion and disease prevention, they must address obesity not only for their own sake but for the sake of the patients as well.

Contributing Factors: Occupational and Lifestyle Influences

The nursing profession is challenging and requires strength and endurance, and often, these two aspects lead to undesirable eating habits, leading to weight gain. Nurses are usually on duty for many hours at a stretch or even at night. They are exposed to several stresses emanating from their working conditions and the tasks they are expected to perform on the patients. In particular, shift work is mentioned as a factor that has been proven to increase the risk of obesity since it impacts circadian rhythms and metabolic regulation and

leads to unhealthy eating and physical inactivity [20]. Shift work that disrupts the natural rhythm of the human body or circadian disruption has been associated with obesity and metabolic syndrome [21]

A cross-sectional study in [22] established that shift workers, especially those working at night, were at a higher risk of gaining weight and being obese as compared to non-shift working healthcare employees. The review also pointed out that nurses who work on rotating shifts or permanent night shifts are most at risk of weight gain because the irregular shift disrupts sleep and increases the consumption of high-calorie foods during the night shift. Most importantly, there is limited physical activity. In addition, employees do not have access to healthy foods during night shifts, and due to stress and fatigue resulting from shift working, they tend to consume fast foods rich in fats, sugars, and calories.

Stress is another critical factor contributing to obesity among nurses. The nursing profession is known for its high stress levels stemming from workload, emotional demands, and organizational challenges [23]. Chronic stress can activate the hypothalamic-pituitary-adrenal axis, resulting in elevated cortisol levels, which are associated with increased appetite and fat deposition, particularly in the abdominal region [24]. Elevated cortisol levels also contribute to the development of insulin resistance, which further increases the risk of obesity and metabolic disorders. In addition to the physiological effects of stress, emotional eating, where individuals consume high-calorie, high-fat foods as a coping mechanism for stress, is common among nurses and exacerbates the risk of obesity [25]. Research has shown that emotional eating is more prevalent in individuals with high levels of job-related stress, and nurses are no exception [26].

Besides, occupational stressors are the influencing factors of obesity among nurses; however, lifestyle stressors such as diet, exercise, and sleep also contribute to obesity. Research has indicated that nurses have a poor diet, take meals at odd times, consume snacks frequently, especially those high in energy, and have a low intake of fruits and vegetables [27]. These unhealthy eating habits are partly attributed to the nature of their work; it is time-consuming and does not allow one to prepare healthy meals. Another barrier could be the availability and accessibility of healthy foods during their working hours, especially at night or in large hospitals where they are forced to consume convenience foods.

Lack of physical activity is also another cause of obesity in nurses. It is quite surprising that while these nurses are physically active during their line of duty, they rarely exercise outside their working hours. A cross-sectional study in [28] established that many nurses did not practice adequate physical activities; the main reasons were fatigue, lack of time, and shift work. This sedentary lifestyle, coupled with a bad diet, leads to a state where the person gains weight over a while. In addition, the nature of nursing work involves handling patients long-term, which can cause physical fatigue, thus reducing the ability of the nurses to exercise during their leisure time.

Lack of sleep is another problem affecting most nurses, especially those working the night shift or rotating shift. Sleep deprivation has been demonstrated to affect hunger-related hormones, including ghrelin and leptin, thus increasing hunger and food intake [29]. Also, sleep deprivation and circadian rhythm disturbance are important metabolic stressors that are related to weight gain and obesity. Daily sleep deprivation results in an energy expenditure reduction of approximately

100 kcal. However, it can also increase energy intake by more than 250 kcal, leading to a positive energy balance and weight gain. Circadian rhythm disturbance decreases energy expenditure by approximately 3% (about 55 kcal per day), alters levels of appetite hormones, and promotes less healthy food choices than sufficient sleep [30]. For instance, nurses are usually on duty for extended hours and may also work at night. Thus, they are bound to be deprived of adequate sleep time, which, coupled with obesity risk factors, increases the risk of obesity.

Socio-Demographic Factors and Obesity Risk

Therefore, it is clear that other factors, such as occupational and lifestyle factors and socio-demographic factors, such as age, gender, ethnicity, and socioeconomic status, determine the risk of obesity among nurses. It was also found that obesity is more common in women than in men, and it progresses with age since metabolic rate decreases and physical activity reduces with age. Hormonal changes also contribute to obesity [31]. It was conducted a study that revealed that older nurses were more likely to be obese as compared to young nurses, hence the need to offer intervention to this group of people [13].

Gender is also a determinant of obesity because female nurses, for instance, record higher levels of obesity than their male counterparts [23]. This gender difference could be attributed to factors such as fat distribution in the body, hormonal imbalance, and culture as much as body shape and health practices [32]. In addition, socioeconomic status is another factor that defines obesity because nurses from low socioeconomic status groups are more likely to face obesity due to such factors as limited access to healthy foods, fewer opportunities for physical activity, and stress, for instance [33].

This is also evident in the prevalence of obesity among the nurses, where ethnic and racial differences are apparent. Research has also found that minority ethnic nurses, especially African American and Hispanic nurses, are more likely to be obese than White nurses [34]. These differences may be due to genetic factors, cultural food habits, and restricted physical activity due to socioeconomic reasons, which may not allow the purchase of healthy foods and physical activities [35].

The Need For Systematic Review

Although the issue of obesity among nurses has become a severe concern, research in this area is somewhat limited and scattered, and the existing studies differ in terms of the range of objectives, methods, and approaches. While some of them focus on the overall prevalence of obesity, others investigate the relative factors like shift working or stress. Nonetheless, there is a scarcity of meta-synthesis in the available literature that can reveal the magnitude of the issue and the determinants of obesity among nurses.

To fill this knowledge gap, the present study will employ a systematic review approach to comprehensively and rigorously synthesize existing knowledge. Systematic reviews provide a robust methodological approach to identifying, assessing, and synthesizing relevant studies and thus reduce the risk of bias and increase the findings' reliability [36]. This paper will adhere to the preferred reporting items for systematic reviews and meta-analyses (PRISMA) checklists to provide a transparent and reproducible account of the study's selection, appraisal, and synthesis to determine the prevalence and risk factors of obesity among nurses.

Objectives of the Review

1. Find the overall incidence of obesity among nurses and compare the occurrence in different countries and workplaces.
2. Examine the risk factors related to obesity in nurses, such as shift work, job stress, and workplace environment.
3. Determine how socio-demographic characteristics, including age, gender, ethnicity, and SES, affect obesity risks among nurses.
4. Analyze the risks, such as diet, physical activity, and sleep patterns, that contribute to obesity among the nurses.

Significance of the Review

The conclusion of this systematic review is going to have a significant impact on healthcare policy and practice. Through this review, the incidence and factors associated with obesity among nurses will be established, thus emphasizing the need to adopt appropriate interventions to improve the nurses' health. Further, it will reveal occupational and socio-demographic factors associated with obesity that may help design intervention programs that address the needs of the nurses. Finally, the overall health of the nurses will be boosted through appropriate obesity prevention and management measures that will not only increase the quality of life of the nurses but also the quality of patient care.

METHODS

Study Design

This systematic review aimed to review the current literature on the prevalence of obesity in nurses internationally and to establish the factors that put nurses at risk of obesity. The study design and the data analysis adhered to the PRISMA checklist (Moher et al., 2009). The review protocol of this study was registered in the International Prospective Register of Systematic Reviews under the registration number CRD42023452330.

Eligibility Criteria

Studies were included if they met the following criteria:

1. Reported prevalence data on overweight and obesity among nurses.
2. Conducted in any global context without restriction to specific regions or countries.
3. Employed observational study designs, including cross-sectional, cohort, or case-control studies.
4. We used standardized anthropometric measurements adhering to WHO criteria for overweight and obesity, defined as a BMI of 25.0-29.9 kg/m² for overweight and ≥30.0 kg/m² for obesity [1].

Studies were excluded if they were conducted on mixed populations without providing discrete prevalence data for nurses or were qualitative studies, opinion papers, or reviews without original prevalence data.

Information Sources and Search Strategy

A comprehensive search strategy was developed in collaboration with a research librarian. The search was conducted globally through PubMed, Google Scholar, Web of Science and China National Knowledge Infrastructure databases with the Publish or Perish software, which extracted 1,000 records. The search utilized a combination of MeSH terms and free-text keywords, including "prevalence," "obesity," "nurses," "risk factors," and "cross-sectional" [37]. Additional studies were identified through the reference lists of selected articles and grey literature searches.

The search string used was, as follows: ("prevalence" OR "rate" OR "occurrence") AND ("obesity" OR "overweight" OR "BMI" OR "body mass index") AND ("nurses" OR "nursing professionals" OR "nursing staff") AND ("risk factors" OR "determinants" OR "predictors" OR "correlates") AND ("cross-sectional" OR "observational study").

Study Selection

After extracting 1,000 records, all the cited citations were uploaded to Endnote for reference management, and the duplicate citations were discarded. The screening process was done in two steps. First, titles and abstracts were screened by two authors simultaneously. From this search, 42 papers were chosen for full-text review according to the inclusion criteria. In the case of disagreement between the reviewers during the selection process, discussions or consultations with a third reviewer were done [37].

Data Extraction

The data was extracted by completing the form where the following details were recorded: study details (author, year, and type of study), population details (sample size, age, gender), and prevalence of overweight and obesity among the nurses. The data extraction form was initially tested on a small number of studies to ensure accuracy and consistency [37]. The data extraction was done independently by two authors (Luo HJ and Yang T).

Quality Assessment

The methodological quality of the 42 selected studies was evaluated using the JBI critical appraisal checklist for studies reporting prevalence data (Figure 1) [38]. While assessing this checklist, the following attributes were checked: the clarity of the sampling method, the size of the sample, and the accuracy of the outcome measures. Papers were assigned quality scores ranging from 0 to 9, and the higher the number, the higher the quality of the studies. The analysis included only the studies with a score of 6 or greater [37].

Data Synthesis and Analysis

The results were analyzed with the help of both qualitative and quantitative approaches. For the overall overweight and obesity meta-analysis, a random effects model was used to determine the global pooled prevalence of nurses. Inter-study variability was measured using the I² value, and publication bias was tested by funnel plot and Egger's test [37]. The data were analyzed using R statistical software version 4.3.1 (<http://www.r-project.org>) (R Foundation for Statistical Computing, Vienna, Austria).

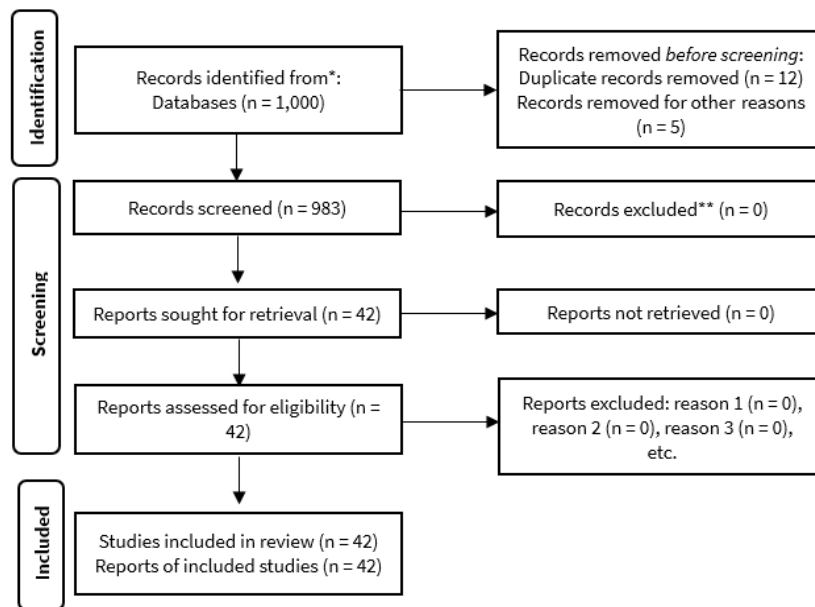


Figure 1. Flow chart (Source: Authors' own elaboration)

RESULTS

Prevalence of Obesity Among Nurses

The level of obesity among the nurses, as presented in 42 cross-sectional studies under consideration, was found to be different depending on geographical location, work environment, and socio-demographic characteristics. The overall pooled global prevalence of obesity amongst the nurses was observed to be 32.4% (95% CI: 28.3%-36.5%) of the students in this group, and the rate varies from region to region. Studies from North America and Europe reported higher obesity rates among nurses, ranging from 30% to 55%, while studies from Asia and Africa reported slightly lower rates, typically between 20% and 40%. For example, in a US study, 53% of nurses were classified as overweight, and 23% were obese, with even higher rates observed in certain sub-populations, such as African American female nurses [39]. In contrast, studies from countries like Japan reported much lower obesity rates, around 12%-18% [40].

Occupational Risk Factors

Shift work, long hours, and high job demands were consistently associated with increased obesity risk. Night-shift nurses were 1.15 times more likely to be overweight or obese compared to day-shift nurses [14]. Obesity was also linked to other aspects of the profession, including high levels of stress at work and inadequate activity during shifts. Five published studies were meta-analyzed, and it was found that shift work and long working hours raised obesity risk by 28% [27].

Socio-Demographic Factors

Age, gender, and ethnicity were identified as factors that contributed to obesity-related risk. It was also found that nurses above 40 were more prone to obesity than young nurses [13]. It was observed that female nurses were comparatively more obese as compared to their male counterparts, mainly in the studies carried out in North America and Europe. Obesity for ethnic minority nurses, especially African American and Hispanic nurses, was also revealed to be higher, sometimes attributed to socioeconomic and cultural factors [34].

Lifestyle and Behavioral Factors

Lack of exercise and an unbalanced diet were also considered to be significant causes of obesity. Several works described the nonadherence to the recommended dietary guidelines, such as consuming foods rich in energy and low in fruits and vegetables. It was identified that American nurses' fast food consumption frequency was two or more times per week: 62% [41]. Also, sedentary activities outside work were observed, with most nurses complaining of fatigue, lack of time, and shift work, among other factors hindering exercise. Among the nurses, physical inactivity was most evident in those who worked the night shifts, where 35% of these nurses had no regular exercise [28].

DISCUSSION

Interpretation of Key Findings

This systematic review focuses on a rising issue of obesity among nurses across the world and informs that the rates often reach or even surpass those of the general population. The pooled prevalence of obesity (32.4%). Therefore, this is an indication that the nurses who are charged with the responsibility of maintaining the health of the nation are at risk of developing obesity-related ailments. These observations highlight the irony of the fact that while practicing medicine, healthcare professionals, particularly nurses, are at a higher risk of developing these diseases as they diagnose and treat their clients.

Shift work, especially at night, is strongly related to obesity risk among nurses; therefore, practical strategies and recommended actions are required in occupational health. Nurses, especially night shift nurses, are at high risk of being affected by shifted circadian rhythms, which result in poor diet, physical inactivity, and sleep loss. These factors do not only impact their health in general but also the kind of treatment they give to the patients. It has been found that night shift nurses have poor diet behaviors, especially more consumption of fat and calorie-content foods than day shift nurses to deal

with shift work and sleep deprivation [42]. Current research shows that 74% of nurses are either overweight or obese, meaning that such health risks are rife among this group of people [42].

Another negative impact of shift work is that it disrupts the quality of sleep; studies show that night shift nurses are more likely to suffer from sleep disorders and poor quality sleep compared with day workers [43]. Long-term sleep loss is positively associated with obesity as measured by BMI and the subsequent emergence of metabolic dysfunction, including impaired insulin sensitivity, which enhances the probability of CVD and diabetes [44]. Based on these outcomes, it is critical to report and prevent the health effects of shift work through supportive organizational practices, offer a healthy diet and sufficient rest for the nurses, and improve the quality of the patient's care.

Occupational Stress and Obesity

One area of concern that has received much attention is the part that stress plays in the promotion of obesity, particularly among nurses. It is established that stress emanating from high job demands, emotional demands, and job characteristics result in emotional eating and, consequently, a higher intake of calorie-dense foods, as backed by several research studies [24]. This paper thus reaffirms the correlation between stress and obesity, where these shift-working nurses are more stressed and thus have the tendency to put on some extra weight.

Shift working and stress are two key factors that make working nurses' overweight since stress leads to emotional eating that results in unhealthy meals. The shift nurses are under much stress due to the irregular working schedules, increased workload, and emotional duress of patient tending. According to the findings, this stress often results in overeating foods with high energy density unhealthy foods, thus reinforcing weight gain. Stress coping mechanisms such as comfort eating, where people eat to comfort themselves, are always observed among nurses, especially when working in stressful facilities. One study pointed out a gap of 74% of female nurses falling under the category of overweight or obese, which is a clear indication of the rising obesity health problems in the occupation [45]. Additionally, the study proved that there is a way through which job stress acts as a mediator of obesity, and the results on oxidative stress show how stress plays a part in endangering both physical and metabolic health risks [45].

A further impact of shift work, especially of a rostered night shift, is the effect it is believed to have on workers' eating habits, as the extended working shift results in the nurses' unhealthy eating patterns, including the consumption of fatty and processed food products [42]. Stress leads to a shift in eating habits, which is characterized by the increased consumption, increased consumption of foods high in energy density and low in nutrients; the pressure forces the nurses into having big meals as a way of dealing with the emotional effects of their work [46]. Further, some adverse health-related behaviors are related to occupational stress, including irregular eating habits and reduced physical activity that led to obesity [47].

Thus, it can be concluded that there is enough evidence to support the connection between stress and obesity in nurses, though, at the same time, it is necessary to stress that reactions to stress are different. Other nurses may use healthier ways of coping with stress, for instance, through participation in

physical activities or frequent practicing of mindfulness, which slightly affects their weight and overall health.

Implications For Healthcare Systems

Obesity has been identified among nurses, with much emphasis on the implications of overall healthcare. Overweight employees, especially nurses, are vulnerable to hypertension, diabetes, and musculoskeletal disorders that lead to high absenteeism, low productivity, and early retirement. Also, the nurses who are obese may experience workplace discrimination, which impacts their job satisfaction, psychological well-being, and promotion. One of the most important issues is the nurses' health in delivering health education. Patients may not adhere to health advice given by an obese nurse, which reduces the impact of interventions aimed at controlling obesity in the general population [48].

Obesity has remained a significant issue, especially among nursing professionals, and this has a significant impact on the health care organizations as well as the health of the nurses themselves. Overweight nurses are more prone to medical conditions, including high blood pressure, diabetes, and back problems that make them be away from work often and less efficient. This not only has a negative effect on the nurses but also directly affects the healthcare system and may lead to staff shortages and reduced quality of patient care. Moreover, the social aspect of obesity can also act as a disadvantage in the workplace and thus hinder career advancement and job satisfaction; stress and emotional pressure as a result of obesity lead to an unhealthy cycle. Research has it that obese nurses work more often than others, and this is attributed to the physical inactivity resulting from obesity-related diseases [49].

A systematic review showed that the global prevalence of obesity among nurses is alarming, at 31%. Approximately 2% were considered to be overweight, while 16.3% were obese [50]. The above trend arouses anxiety about nurses' wellbeing and ability to function optimally. Furthermore, it is argued that the skills of nurses in health education might be reduced because patients may not follow preventive care advice given by a visibly obese health professional since patients may not be able to trust the information they are receiving from such a person [47]. The physically and emotionally demanding nature of work in nursing makes employees take unhealthy meals, such as high-calorie meals, during shift work, which worsens the problem [49].

Although the detrimental effects of obesity concerning the nursing workforce have been well established, enhancing these health risks with encouraging organizational policies like providing healthy foods and organizational wellness programs could go a long way in improving the health of the nurses and patients.

Socio-Demographic Disparities

The review focuses on the social demographic factors that influence the prevalence of obesity amongst nurses. Older nurses, female employees, and employees of ethnic minorities are more likely to be obese, pointing to the fact that there is a need to target efforts at those groups of employees based on the challenges they are likely to encounter. For example, some of the needs older nurses may have been assistance in exercising as they grow older, while other nurses from lower classes may need better provision of healthy foods at the workplace. Obesity among nurses depends on the socio-

demographic indicators, with nurses who are older in age, female, and belong to ethnic minorities at a higher risk than their younger, male, and ethnically majority counterparts. This calls for methods to help such students overcome their various challenges. The elderly nurses are challenged by age factors and working stresses, including shift duties that may hinder them from exercising [47].

A systematic review suggested that the prevalence of overweight among nurses can vary between 29 and 76 %. For example, it increased from 6% to over 62%, thus calling for an age-sensitive support program [51]. The female gender, which is a large population in the nursing profession, is also prone to obesity in that, due to social and work-related challenges, they might not be able to afford nutritious food. Nurses from ethnic minorities and low-income families have even more challenges. For example, it is difficult for them to afford healthy food, thus increasing the obesity threat [52]. A cross-sectional survey revealed that the percentage of obesity among nurses differs across regions, with higher percentages observed in Southeast Asia, hence the call for regional approaches [50]. Hence, as much as these highlight the need for culturally sensitive interventions, it is also necessary to consider the systemic factors that either amplify or offset the difficulties faced by the nurses—such as workplace and community policies and support structures.

CONCLUSION

This systematic review has shown that obesity is prevalent among nurses across the world, and occupational, lifestyle, and socio-demographic factors contribute to obesity risk among nurses. Those who work at night, have high-stress levels, eat unhealthily, and lead a sedentary lifestyle are most at risk. Hence, the study recommends that healthcare organizations require strategies to enhance the well-being of nurses, such as weight loss initiatives, stress-reducing measures, and healthful diet and exercise policies.

Indeed, it is important to address obesity in the nurses not only for their health benefits but also for the patients. Therefore, future research should aim to test and implement strategies that can address issues affecting nurses, such as shift working, stress, and demographic differences. Therefore, by encouraging healthier choices among nurses, healthcare systems can fight the general obesity crisis while ensuring that nurses can be good role models to their patients.

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Declaration of interest: No conflict of interest is declared by the authors.

Data sharing statement: Data supporting the findings and conclusions are available upon request from the corresponding author.

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