

The Effect of Occupational Stress on Critical Care Nurses' Performance in a Tertiary Hospital in Makkah, Saudi Arabia

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Abstract

Occupational stress is a global problem imposing harmful effects on the employee's psychological and physical state, and can have a direct impact on the organisation's managers and employees. As a result, it negatively affects their quality of care and productivity. The healthcare sector is one of the significant fields affected by occupational Stress, and it disturbs both hospital performance and patient satisfaction. The study investigates the relationship between occupational stress and critical care nurses' job performance, measures occupational stress levels, and determines the most stressful factors that arise from critical care nurses' occupational stress. This study is a descriptive correlational cross-sectional study conducted at Al-Noor Specialist Hospital, Saudi Arabia, Makkah. An electronic self-administrative survey was randomly distributed to all nurses in I.C.U., CCU, OR, E.R., and the burns unit. It designed to assess nurses occupational stress stressors in the critical care departments. The survey instrument consists of three segments: assessing occupational stress and Nursing Performance. The findings indicates a significant relationship between occupational stress and educational and marital status, offering a higher stress level among single nurses with a master's degree certificate. While, the nurses' performance shows a significant relationship with nurses rank, showing the highest performance among assistant nurses. Furthermore, the study found a significant association between O.S. and the critical care nurses' job performance ($P = 0.043$), and that relationship was a negatively negligible correlation since ($r = - 0.191$). Performing Further research is necessary, since this study was affected by the COVID-19 Pandemic.

Keywords: Critical Care Unit, Cross-sectional Correlation, Nurses, Occupational Stress, Performance, Saudi Arabia, Work-related Stress.

Introduction

Occupational stress (O.S.) is a global problem that poses harmful effects on employees' psychological and physical states (Cooper & Marshall, 2013). According to the World Health Organization (WHO), occupational stress: "Is the response people may have when presented with work demands and pressures that did not match with their knowledge and abilities and which challenge their ability to cope" (Leka et al., 2003; Maulik, 2017). Occupational stress has a direct impact on the organisation's managers and employees (Maulik, 2017). As a result, some employees are demotivated to influence their functional ability, health & wellbeing, and moral behaviours. It will negatively affect the quality of their work and productivity (Jayashree, 2010). The healthcare sector is one of the major fields affected by occupational stress

(Beheshtifar & Nazarian, 2013). However, healthcare organisations that lack stress management support facilities have more issues influencing their quality of care (Beheshtifar & Nazarian, 2013).

Although all healthcare workers face complex work conditions, it has been found that nursing is one of the most stressful professions due to its nature and requirements (Hingley, 1984; Pisljar et al., 2011). Likewise, nurses are highly prone to work-related stress as their stress is mainly associated with physical labour, the emotional demands of caring for their patients and families, long working hours, duty shifts, and interpersonal relationships (Roberts et al., 2012). The continuous increase in the use of sophisticated healthcare technologies, budget cuts, increasing workload, and constant organisational changes in some healthcare environments have been the main factors in the rise in nurses' stress rate since 1980 (Roberts et al., 2012). Moustaka & Constantinidis pointed out the six factors affecting occupational stress: the nature of the nurses' job, the role's characteristics, the work environment, interpersonal relationships, organisational factors, and individual characteristics (Moustaka & Constantinidis, 2010). There is a need for the healthcare sector to focus on increasing critical care units' capacity to improve the quality of its services to reach patient expectations (Adhikari et al., 2010). Lakanmaa defines "Critical care" or "Intensive care" as the care given to acute, medically complex, and critically ill patients, which depends on the continuous monitoring and sustaining of the vital functions of these patients (Lakanmaa, 2012). An Intensive care unit (I.C.U.) is also defined as an organised system that provides specialised intensive medical and nursing care to critically ill patients (Alharthy & Karakitsos, 2019; Marshall et al., 2017). Furthermore, critical care services are linked to the practice environment, which is the physical layout that facilitates continuous observation and staff to reach the patient in the I.C.U. unit immediately. Alongside fast technological innovations. Also, there is a low nurse-to-patient ratio (Schmalenberg & Kramer, 2007). This ratio refers to that one nurse has responsibility for a relatively low number of patients (Dousay et al., 2016; Rassin & Silner, 2007).

The increased responsibility that Critical Care Unit nurses have is patient care due to their critical condition, which makes their jobs very stressful (Sawatzky, 1996). The I.C.U. outcomes, such as patient mortality, are also associated with nurses' burnout, stress, turnover, and low job satisfaction (Schmalenberg & Kramer, 2007). A study conducted in the United States of America reported higher occupational stress, turnover, and low job satisfaction among Critical Care Units nurses than among other hospital unit nurses (Schmalenberg & Kramer, 2007).

Problem Statement

The health sector in the Kingdom is undergoing a qualitative Transformation period, which causes many unprecedented changes in the health sector (Ministry of Health., 2019). The future vision of the Kingdom is directed toward improving religious tourism (Henderson, 2011). The Kingdom includes the first and second holiest cities in the entire Islamic world. The Kingdom of Saudi Arabia is making unremitting efforts to develop the health sector in the region and improve health services for visitors, citizens, and residents (Ministry of Health., 2019; Saudi Arabia National Portal, 2021). Nurses are also a cornerstone of the global health sector. The nursing sector in the Kingdom faces several challenges, including increased needs, demands, expectations, and population requirements. Besides the continuous increase in healthcare expenses. Also, the Saudi health sector suffers from a shortage of nursing staff, as the nurses per 10000 population ratio reached nearly 55.2 in 2018, despite the noticeable increase in 2019 when it was 58.2 per 10,000 population. Despite this remarkable improvement, the Ministry's plans are directed to increasing the nursing staff and their efficiency. In comparison, this ratio represented a clear difference between the United Kingdom ratio in 2019 by 102.9 and 156.9 in the United States of America in 2018 (Ministry of Health, 2018; World Health Organization., 2021). These shortages show the heavy workload carried by the nurses in K.S.A. The new developmental trend is to form health clusters to increase the extent and quality of services provided to citizens, residents, Umrah performers and pilgrims in the Kingdom of Saudi Arabia (Saudi Arabia National Portal, 2021).

Makkah Al-Mukarramah is distinguished by its religious position and high population density. Its population represents approximately 26% of the total population of the Kingdom (Ministry of Health, 2018). It is also characterised by the two seasons of Umrah and Hajj, as the number of umrah performers and pilgrims may reach approximately 18,000,000 per year (Ministry of Health, 2018). Despite the numerous studies that focus on work stress causes and effects on the nursing profession and its practitioners in Saudi Arabia, only a few studies have dealt with the issue of relationships and the impact of work stress on the performance of nurses in Saudi health facilities. For example, two studies were performed in the western region and another research in the southern division, and other studies were conducted in different divisions. However, no studies have been implemented in the holy city of Makkah despite the place importance. The nurses in the city were observed facing many other pressures resulting from the increasing work pressure according to the religious and cultural seasons.

Abreast one study reported that health practitioners in health facilities in Makkah suffered approximately 52% of them being subjected to workplace violence, while nurses represented about 67% of the study sample. The study reported that violence in the workplace often occurs when dealing with patients and their families. The study found that the employees in the emergency department are nearly three times more likely to be exposed to violence than in other departments (Al-nemari & Salem, 2020). Another study showed that 52% of nurses suffered from different degrees of depression resulting from various causes, such as night shifts for a period of up to two weeks or more, in addition to the length of the weekly working hours, where approximately 52% of nurses reported working for more than 55 hours, per week. Besides, the study showed that about 60% of the nurses working in intensive care, 51% in the surgical departments, and 50% in the emergency and accident departments are exposed to different degrees of depression (Jaamal, 2017). The Welsh study confirms the statistical relationship between work stress and depression (Welsh, 2009); those previous studies raise the probability of nurse exposure to work-related stress and influencing nurses' performance. Regards Previous research shows that there is a problem with the nurses of Makkah Al-Mukarramah. Also, it the necessity to pay attention to the nurses' concerns and try to create possible solutions to improve the work environment and reduce the accumulated stress of nurses and improve the nursing performance in line with the future vision of the Kingdom of Saudi Arabia.

Significance of the Study

Occupational Stress has severe consequences on employees, physical and mental well-being, work performance, satisfaction, and turnover rate. These can impair the hospital's financial status, performance, and patient satisfaction. Most of the studies conducted in this field have assumed that O.S. affects the nurses' physiological and psychological wellbeing (al Hosis et al., 2013; Onasoga Olayinka et al., 2013), but to a different degree, according to the stressor. As individuals, they respond to work pressures in different ways, and thus this effect may remain on the personal level of the individual, or its impact might extend to the patient (Beheshtifar & Nazarian, 2013). Several studies have confirmed that it affects individual performance (AbuAlRub, 2004; Mokhtar et al., 2016; Qattan, 2017; Safarpour et al., 2018), level of job satisfaction (AbuRuz, 2014; Teixeira et al., 2013), and the possibility of causing damage to the health facility. The O.S. may also affect the hospital's financial status due to a high turnover rate (Al-Omar, 2003; Antigoni et al., 2011) and increased error rate, such as medical errors and so on (Elfering et al., 2006; Oh et al., 2016; Park & Kim, 2013). On the other hand, hospital performance is also affected by a staff shortage caused by the high turnover rate, leading to staff burnout due to an increased workload. It also causes a reduction in the level of services provided (Antigoni et al., 2011) and has a more significant effect on patient safety that could be the result of a frequent sentinel event or medication error (Elfering et al., 2006; Oh et al., 2016).

This study focuses on stress factors that might be resolved by improving management tools and developing organisational management systems. Also, hospital administrative procedures, policies, regulations & laws, taking previous precautions and setting protection roles to prevent critical care nurses O.S. Improving hospital management will enhance the working environment and increase job security. Also, play a vital

role in reducing work fatigue and increasing the nursing field joining rate. In particular, it improves nursing performance and raises the quality of the medical services provided to patients.

Research Aims and Objectives

This study aims to investigate the relationship between occupational stress and critical care nurses' job performance. The main objectives are as follows:

1. To measure the level of occupational stress among critical care nurses.
2. To determine the most stressful factors of occupational stress among critical care nurses.
3. To determine the relationship between occupational stress and critical care nurses' performance.

Literature Review

Occupational Stress Definition

Work stress is known as occupational stress (O.S.) or work-related stress (W.R.S.). The World Health Organization (WHO) define occupational stress as "the response people may have when presented with work demands and pressures that not matched to their knowledge, abilities and which challenge their ability to cope." (Leka et al., 2003). JÄRvelin-Pasanen, define O.S. as " A pattern of reactions that occurs when workers are presented with work demands that are not matched to their knowledge, skill or abilities, and which challenge their ability to cope" their definitions completely comply with WHO definition (Dewa et al., 2007; Järvelin-Pasanen et al., 2018).

Occupational stress in Saudi Arabia

Numerous studies have been done in Saudi Arabia since 2010 that explore occupational stress predictors, their impacts, and their association. Those studies have documented work-related stress from different perspectives in different regions and organisations in Saudi Arabia. A survey conducted in Al-Khobar aimed to assess the prevalence of burnout syndrome among Saudi nurses. They reported that Saudi nurses are exposed to high emotional exhaustion and low personal accomplishment. It also stated that approximately 70% of Saudi nurses experience burnout syndrome due to a lack of organisational support to reduce burnout syndrome. Besides long working hours, they are under 35 years old. They lack working experience since they are employed immediately after graduation with only one year of pre-graduation training, dealing with patient death and suffering, and are finally affected by the social-cultural (Halfa & Turki, 2010). A study conducted in Al Dammam predicted that work-related stress among nurses is significantly associated with female nurses, younger than 30 years old, Saudi nationals, married, working on different shifts, and assigned to the surgical department. Those nurses showed a higher stress level than the other nurses (Al-Makhaita et al., 2014). The study limitation appeared when they did not explain the reasons behind their results. It was only upon mentioning their findings and comparing them with the results from previous studies. Another study conducted in Riyadh city, exploring nurses' O.S. in acute care hospitals, declared working more than 8 hours per day and 46 hours per week was a significant predictor of stress among nurses. These long working hours affect nurses' life balance, leading to physical and mental problems. Long working hours are associated with nurses' O.S. levels and severe health problems (Almazan et al., 2019). Previous studies conducted in Saudi Arabia included small sample size, varying in their qualities, perspective, hypothesis, scope, research instrument, population, characteristics, and research settings. These differences prohibited the possibility of generalising those findings on all the healthcare workers in the Kingdom.

Occupational stress impacts on nurses

1- Occupational Stress impact on the nurses' wellbeing and behaviours Research

Moustaka & Constantinidis conducted a literature review focused on the O.S. sources and effects, drilling down to nurses' impact into three segments. The first effect is on nurses' behaviour, reflecting on their ability to make decisions and cope with their assigned tasks. The second effect was causing mental problems, including anxiety, depression, insomnia, and a feeling of incompetence, finally impacting nurses' physical health and wellbeing. Stress increases the possibility of the following diseases: heart disease, migraines, high blood pressure, diseases of the digestive system, and other diseases that affect the body in general. This results in a loss of concentration, decrease their motivational levels and leads to excessive anxiety, which eventually reduces their performance. Hence, occupational stress impacts their behaviour, causing mental health problems and physical health issues (Moustaka & Constantinidis, 2010).

Another study stated that about 28.7% of the nurses frequently think about leaving the profession as they experience high-stress levels. The study confirmed a strong association between O.S. and burnout symptoms, which strongly relates to turnover rates (Hämmig, 2018). In an indication of causation, the relative risk of burnout and turnover intentions are about 15 to 100 times higher for those exposed to O.S. (Hill, 1965). A study conducted in Isfahan, Iran, reported that about 35% of nurses intended to leave the hospital if they could find another work opportunity. It suggested that OS / WRS are positively associated with nurses' turnover intentions (Mosadeghrad, 2013).

The study found that work stress is associated with a high rate of absence among nurses, and the nurses' absenteeism gives a feeling of suffering to the rest of the nurses. As a result, it causes a high workload and W.R.S. for the rest of the nurses. The study concluded that absenteeism affects and is affected by work stress (Daouk-Öyry et al., 2014). Likewise, O.S. has a severe impact on patients and can cause increased absenteeism and exhaustion among nurses (Moustaka & Constantinidis, 2010). Davey et al. emphasise that job stress is associated positively with absenteeism (Davey et al., 2009).

2- Occupational stress impacts on the health organisation

Occupational stress affects the efficiency of the entire health organisation. It reduces the quality of its services due to occupational stress-related diseases, which leads to a high absenteeism rate, and a decrease in the level of job satisfaction among them. Also, the strong correlation between O.S. and the high turnover rate among nurses imposes its weight on the remaining nurses' rising workload. These effects decreased their productivity level and the prevalence of negativity in the work environment, which cause increase nurses' unsafe behaviours, leading to an adverse health and safety culture. Highly-stressed nurses have an approximately 30% higher exposure possibility for work injury than those who do not suffer from stress at work. The increased risk of nurses' exposure to injuries leads to a higher chance of work accidents to their colleagues and their patients. (Damit, 2007).

Elfering et al. reported the most stressful events related to patient safety among nurses included incomplete or incorrect medical documentation of the patient record, approximately by 40%, followed by a medication incident of roughly 21%, and then delay in providing medical service to the patient by close to 10%. It states that work stress and poor work control were among the most critical factors that risk patient safety. Interestingly, the study said that working in an environment characterised by high competence requirements and poor management increases patient safety risks. It was a descriptive study, and the researchers refer to these results as biased by the study characteristic and small sample size. The study was based on the researcher's self-monitoring and evaluation according to specific criteria, without conducting a self-administering survey among the work environment to obtain their opinions regarding the subject. Eventually, the study emphasises continuing the association between work stressors and patient safety to decrease any preventable situation and ensure patient safety in the hospital (Elfering et al., 2006).

Another study conducted on nurses in Norway corresponded with the results of the previous research. They note three factors that were affecting nurses' occupational stress. These included a demanding work environment, poor work control (e.g., when the nurses did not have the right to decide on the care provided), and the colleagues' social support; it also declares the relationship between these factors and patient safety. The study acknowledges those factors related to nurses' occupational stress and thus the impact on patient safety. They concluded that the most potent factors appeared when the patient's error happened as it is a stressful environment, followed by unsupportive senior staff (Berland et al., 2008).

O.S. represents more than 60% of healthcare practitioners' medical problems caused by physical and mental issues. Healthcare facilities incur a significant number of financial losses due to nurses being exposed to stress at work and incurring many expenses to treat O.S. effects on nurses (Damit, 2007). In Europe, dealing with W.R.S. injuries frequently costs 20 million euros annually (O'Keefe et al., 2014). The United Kingdom also estimated its financial losses resulting from treating illnesses caused by stress at work at nearly five billion pounds, equivalent to losing seven million working days annually (Damit, 2007). Whereas, the National Mental Health Association reported that the decline in the workforce's performance in general in the United States of America (U.S.A) due to their exposure to work pressures and their effects cost nearly 29 \$ million (O'Connor, 2002).

Occupational stress factors

Concern about occupational stress (O.S.)/work-related stress (W.R.S.) affecting nurses has been a growing problem. There is an increasing focus on healthcare issues and a substantial increase in healthcare expenses due to healthcare technology's fast development in recent years (Lambert & Lambert, 2001).

A literature review of nurses' stress/strain from an international perspective contained more than 100 published articles since 1990 about nurses' stress. The studies were from 17 countries. Those articles mentioned several stressors for nurses work. Most of the studies coalesce on the workload, lack of resources, job security, job responsibilities, managerial support, commencing with cases where patients have died, their relationship with the patients and their relatives, workplace communication, and their relationship with doctors, and other healthcare practitioners. At the same time, there is a wide variety of stressors mentioned. These differentiated between countries due to differences in the sample size and characteristics (Lambert & Lambert, 2001).

A study conducted on the nurses in al-Riyadh, Saudi Arabia, documented that four causes were significantly related to O.S. in Saudi Arabia. These included insufficient technical facilities, a lack of appreciation by hospital management, long working hours, and short breaks. It also showed that the nurses' nationality affected O.S.'s level, and Saudi nurses had a higher O.S. level than non-Saudi-nurses. Their social commitments caused this stress. It also concluded that Saudi hospitals must improve their technical facilities and management appreciation to motivate performance. Separation of tasks reduces the stress caused by their considerable workload. Also, allowing longer breaks would resolve the problem of tedious working hours. Hence, managing occupational stress increases hospital nurses' productivity and job satisfaction (Al-Omar, 2003).

Occupational Stress in Critical Care Areas

Critical care departments have a specific procedure due to the special patient care required. A study conducted in Al Baha, Saudi Arabia, showed that the anxiety rate was mostly mild among critical care nurses. The highest anxiety rates noticed in I.C.U. and E.R. This result was due to the study's geographical situation, as it conducted in a local area. This situation requires nurses to face life-end decisions, alongside nurses must have high competency levels to achieve the performance demand needed for this local city (Ahmed, 2015). On the other hand, a U.K. study showed that nurses' stressors could differ according to their department, such as I.C.U. Nurses lead a higher stress rate because they deal with patients' deaths (Al-

Nabhani et al., 2016; McVicar, 2003). Also, in Saudi Arabia, I.C.U. Nurses have higher stress due to their fear of medical or interventional error (Alharbi & Alshehry, 2019). Another study conducted in Muscat city, Oman, disagreed with previous studies and showed a low level of stress in critical care units. 4.1% of I.C.U. Nurses were under pressure in total, with 8.6% of them having an above-average stress level. While in the E.R. department, they were 10.3% - 20.70%. The highest stress level in total is in the surgical wards by 28.1%, followed by 18.5% in medical and 17.8% in OB/GYN wards. In this study, it was not clear why the stress level was higher in these departments. The respondent's nature may affect the results as 27.2% of the sample size are from surgical, 21% from OB/GYN, and 18.5% from internal medicine departments (Al-Nabhani et al., 2016).

Critical care nurses face continuous technology challenges, as they must comply with the new technological advancement and learning in these departments. For nurses to adapt to these profound changes, they must have constant training and education to provide an adequate service. They also had direct interaction with the critically ill patients and their families to provide emotional support. Besides facing challenges such as staff shortage, lacking support from supervisors, and other support departments, nurses also face the law and regulations regarding the amount of pay they receive and the high-performance expectations required of them (Alharbi & Alshehry, 2019).

Nurses working in the E.R. suffer from insufficient time to complete tasks assigned, which caused by the fact that working in the E.R. is a fast-paced environment that includes performing lifesaving interventions. This working environment puts on more pressure and leads to fears of making mistakes among healthcare professionals, besides those associated with sleep disturbance, sick leave rates, and interpersonal conflicts, resulting in hard work in the emergency department. These factors show an inadequate work environment and high work insecurity among healthcare professionals in the emergency department (Durand et al., 2019).

Nurses Performance

Worldwide, all sectors are moving toward the quality improvement field based on the actual performance measurement. This orientation leads to intensification on knowing work performance essence, characteristics, and influential factors.

There was no universal definition of work performance until 1997; a study defined work performance as "The total expected value to the organisation of the discrete behavioural episodes that an individual carries out over a standard period." (Motowidlo & Kell, 2012).

Health care services have a unique structure, so the definitions of nurses' performance relate to their essential nursing services, which has resulted in multiple meanings and a lack of agreement on a specific nursing performance definition. A study conducted in Turkey defines nurses' performance as "The way and the process of how the nurses serve nursing for the patient and others." (Mehmet, 2013).

A literature review conducted in 2009 categorises nurses' tasks into three classifications: direct patient care, indirect patient care, and non-nursing tasks. These tasks together constitute nursing performance in general. While for measuring the performance of nurses, the study indicated three tools of measurement, which are competencies that nowadays are essential in all hospitals before employment and done periodically after employment to measure the effective application of knowledge, judgment, and skills expected from the nurses (DeLucia et al., 2009; Mehmet, 2013). This tool followed by nursing-sensitive quality indicators based on the nurses' services' impacts on patient outcome. These tools could easily be affected by various factors such as medication error, hospital-acquired infection, and falls. This method lacks a standardised definition and agreement on the key measures used, in addition to insufficient data regarding nurses' units and shifts. The third performance measurement tools consist of a specific nurse's tasks and measuring nurses' performance based on specific nursing tasks, such as triage decision and heart disorders

management procedure. This performance measurement tool is affected by two factors: Physical factor-like environment characteristics such as noise, lighting, number of the patients assigned (single or multiple patients rooms), and layout (workplace design), besides work-related musculoskeletal disorder caused by an improper work environment, resulting in nerve, tendon, and muscle injuries. At the same time, organisational factors like working hours, staffing, workload, and hospital nature. For example, if they are working in an idealistic organisation (DeLucia et al., 2009).

Theoretical Framework

The study follows a quantitative research approach. The quantitative analysis set out to gather data using measurement, analyse this data for trends and relationships and verified the measurements (Watson, 2015). The study designed to be a descriptive correlational, cross-sectional survey, aiming to investigate the research questions and objectives. The intention is to explore the relationship between O.S. and critical care nurses' performance and examine the nurses' demographic characteristics. as well as their effect on the O.S. level and nurses' performance. Furthermore, it explored many OS-specific factors: problems related to the supervisor, workload, patients and their families, death & dying, and discrimination, the nurses' performance factors based on the nurses' activities related to critical care. Inclusion criteria: The nurses must be M.O.H. employees, work in a critical care department, and aged 20 years and older. Exclusion Criteria: Nurses excluded from the study are leading position nurses, such as Head nurses, Charge nurses, and Medication nurses. This exclusion is due to their constant preoccupation and additional responsibilities. Also, this study does not assess or measure nurses leadership capabilities which may affect their occupational stress level.

Furthermore, they have a choice to participate in the study voluntarily, be working in the Accident & Emergency Room Unit (E.R.), Intensive Care Unit (I.C.U.), Coronary Care Unit (CCU), Operation Room Unit (OR), or Burns Unit. Research Instruments: The study uses two specific instruments, the O.S. instrument, an Expanded Nursing Stress Scale (French et al., 2000) As for the Nurses' Performance instrument, this is a Six Dimension Scale of Nursing Performance (Schwirian, 1978). While there were additions of questions about the nurses' demographic characteristics. At the same time, this study focuses on five subscales with 27 items. Participated nurses asked to rate their potential stressors on a 5- point Likert scale ranging from 1= never stressful to 2=occasionally stressful to 3= frequently stressful to 4=always stressful to 0= does not apply. The ENSS Parts in this research will provide measurements based on these five items only. The Six Dimension Scale of Nursing Performance (6-DSNP). Simultaneously, this study focuses on one sub-scale the critical care, with seven items only. Participate nurses asked to rate themselves based on six items as [how often they perform these activities in their current job] (column A). In this column, the nurses rate themselves by the items as 4 points Likert scale ranging from 1= not expected in this job to 2= never or seldom to 3= occasionally to 4= frequently. Simultaneously, this column focuses on the nurses' performance quality by asking the participated nurses [How well they perform these activities in their current job] (column B). it has a 4-point Likert scale ranging from 1= not very well to 2= satisfactory to 3= well to 4= very well. The 6-DSNP customise to provide measurements based on the critical care performance items only, assuming the higher the score reflects higher performance. the questionnaire distributed to volunteering nurses. Under Nursing Office instruction. Due to current circumstances, the survey instrument converted into an online survey on www.surveymonkey.com (website) to facilitate accessibility, increase the response rate, and avoid the spread of the COVID-19 infection through physical contact. The questionnaire distributed using a Mobile Application (WhatsApp) or SMS. it circulated to all the critical care department nurses. A bulletin was also put up on the bulletin board, briefly explaining the questionnaire's intention with a Quick Response code (Q.R.) that led to the survey page in the critical care departments only. Data collection started on the fourth of June 2020 and continued until 18 July 2020. The data collection instrument modified, and since the study conducted in Saudi Arabia, the participant assumed to be a native of the Arabic language. Therefore, the research instrument translated into the Arabic language and checked by double translation. The Expand Nurses Scale (van Bogaert et al., 2014) assesses the stress level with five main items, and the Six-Dimension Scale

of Nursing Performance evaluates critical care items. Both instruments have acceptable reliability, from .800 and .899, respectively. All critical care department staff nurses in Al-Noor Specialist Hospital included in this study. The overall targeted population equal to 316 nurses. The sample is a cluster sample, estimated by the online website <https://www.calculator.net/sample-size-calculator.html>. It declares the sample size (n= 174) is needed to have a confidence level of 95%. total population and sample size divided by department and percentage. The overall sample population is enclosed in Al- Noor Specialist Hospital critical care department (Intensive Care Unit, Coronary Care Unit, Operation Room Unit, Emergency Room Unit, and Burn unit). The sample is a cluster sample. the target population was critical care department nurses working in Al-Noor Specialist Hospital, a public hospital with a 500-bed capacity in Makkah city, Saudi Arabia. The critical care departments included in the study are the Accident & Emergency Room Unit (E.R.), Intensive Care Unit (I.C.U.), Coronary Care Unit (CCU), Operation Room Unit (OR), and Burns Unit. Nurses ranks included in the study are Specialist Nurse, Technician Nurse, and Assistant Nurse. The nurses are all allocated in those five departments, according to the capacity in the department. the data collected analysed using the Statistical Package for the Social Sciences (SPSS) program, version 25. The survey questions must be answered by 90%. To be counted as a complete survey and entered into the data analysis. All variables were analysed using appropriate descriptive statistics for each variable. An analysis of variance (ANOVA) performed to examine differences in the mean value of each of the following factors (age, marital status, education level, nurses' rank, years of experience, and departments / Unit). Simultaneously, the independent T-test was used with the sex and nationality factors, with the overall O.S., and critical care nurses performance mean values. It Followed by an assessment of the bilateral relationships between O.S. Main Subscale stressors and critical care nurses performance using the Pearson's Correlation test. A simple linear regression analysis was used to investigate the relationship between O.S. and the critical care nurses' performance. Significance level set to be equal to 0.05 to ensure analysis significance.

A Bioethics online training course completed, and a valid certificate awarded from the National Committee of Bioethics (NCBE) at King Abdulaziz City for Science and Technology (KACST), whit number [10016185]. ENSS survey Instrument approval gained through Email message. Legal permission provided by the Saudi Arabia Ministry of Health (M.O.H.), who gave its approval to conduct the study in the hospital properties, approval number [H-02-K-076-0420-292]. All nurses who volunteered to participate in the survey agreed to sign the consent placed on the questionnaire's front page. All the volunteers had the full right to continue participating or withdraw without entailing any obligations or penalties. No identifying information was required in the questionnaire to ensure the participant's anonymity and confidentiality. The survey mainly considers the participants' privacy and rights by Not including any questions related to the participant identity.

Analysis

Socio-Demographic and Work Characteristics

The study sample size was 174 nurses. The total number of participants was 221. Only 113 completed the survey, while 108 responses were not valid. Therefore, the response rate was 64.9%. Most of the nurses were Saudi nationals. Out of the (113) nurses, the majority were female (n=109, 96.5%), and the minority were male (n=4, 3.5%). Besides, most of them aged between (30-39 years old) and (61.9%) had a bachelor's degree (n=70), as reported in (Table 1). Also, it shows the nurses' Marital Status, work department, job rank, and years of experience.

Table 1 Socio-Demographic and Work Characteristics

Variable	Category	Frequency (%)
Age	20-29	26 (23.0%)
	30-39	64 (56.6%)
	40-49	18 (15.9%)
	50-59	5 (4.4%)
Gender	Male	4 (3.5%)
	Female	109 (96.5%)
Nationality	Saudi	71 (62.8%)
	Non-Saudi	42 (37.2%)
Marital Status	Single	36 (31.9%)
	Married	72 (63.7%)
	Widow	4 (3.5%)
	Divorced	1 (.9%)
Department	OR	20 (17.7%)
	I.C.U.	33 (29.2%)
	CCU	18 (15.9%)
	Burns Unit	12 (10.6%)
	E.R.	30 (26.5%)
Education Level	Diploma	33 (29.2%)
	Bachelor	70 (61.9%)
	Master's Degree	10 (8.8%)
Nurse Rank	Specialist	69 (61.1%)
	Technician	40 (35.4%)
	Nurse Assistant	4 (3.5%)
Years Of Experience	one year and less	7 (6.2%)
	from 2 - 5 years	24 (21.2%)
	from 6-9 years	24 (21.2%)
	from 10 -14 years	32 (28.3%)
	from 15-19 years	22 (19.5%)
	from 20 years or more	4 (3.5%)

Note: The values reported as frequencies and percentages.

The Assessment of occupational stress and the critical care nurses' job performance

1- Expanded Nurses Stress Scale (ENSS) Assessment

To quantify the weighted mean for positive inquiries, the configuration of a regular five levels scale used, represented in table 2:

Table 2 Means Level Format Of Typical Five-Level Scale

Mean range	Stress Level Question
0 to < 0.8	Does Not Apply
0.8 to < 1.6	Never Stressful
1.6 to < 2.4	Occasionally Stressful
2.4 to < 3.6	Frequently Stressful
3.6 to <= 4	Always Stressful

Assessments of overall Nurses' Occupational Stress and the main categories of their sub-scales

Table 3 Assessments of overall Nurses' Occupational Stress and the main categories of their sub-scales.

Assessment	Occupational Stress Sub-scale	Mean	± S.D.
Frequently Stressful	Problems Relating to Supervisors	2.74	0.97
Occasionally Stressful	Discrimination	1.69	1.42
Frequently Stressful	Workload	2.64	0.96
Frequently Stressful	Death and Dying	2.96	1.10
Frequently Stressful	Patients and their Families	2.72	1.04
Frequently Stressful	Overall Nurses' Occupational Stress	2.55	0.89

2- Six-Dimension Scale of Nursing Performance Assessment:

A Four-point Likert scales estimated critical care nurses' performance concerning critical care specific tasks. To quantify the weighted mean for positive inquiries, the configuration of a regular four levels scale used, represented in table 4:

Table 4 Means Level Format of Typical Four-Level Scale

Mean Range	Column A (How Often do they Perform these Activities)	Column B (How well do they Perform these Activities)
1 to < 1.75	Not Expected In This Job	Not Very Well
1.75 to < 2.5	Never Or Seldom	Satisfactorily
2.5 to < 3.25	Occasionally	Well
3.25 to <= 4	Frequently	Very Well

The overall critical care performance assessment in the following table (4) reported that the weighted mean of the critical care performance was the Mean ±SD = (3.23 ±0.62). Also, deviations in each question's answers were slight, indicating no distraction in the study population. As for the Mean ±SD = (3.32±0.66) of "How Often do they Perform these Activities" was "Frequently" repeated and higher than the Mean ±SD = (3.13 ± 0.72) of "How well do they Perform these Activities", which was "well".

The means of main factors of the critical care nurses' performance were reported briefly in the following table 5:

Table 5 Overall assessments of Critical care Nurses' performance

Critical care performance	Overall Mean	Assessment
Column A (How Often do they Perform these Activities)	3.32	Frequently
Column B (How well do they Perform these Activities)	3.13	Well
Overall Critical care performance	3.23	Frequently well

Occupational stress and the critical care nurses' job performance, according to demographic information and work characteristics

From table 6, the results of the One-way ANOVA indicated no significant differences for occupational stress, according to (Age, Nurse Rank, Years of Experience, and Department / Unit) since the P-values were higher than 0.05. The one-way ANOVA results indicated a significant difference in occupational stress according to (Marital Status and Education Level) since the P-values were less than 0.05. And it was the highest for single nurses who had a master's degree.

The T-test results indicate no significant differences in O.S. according to (gender) since the P-values were higher than 0.05. However, there was a significant difference in O.S. according to (nationality) since the P-values were less than 0.05. And it was higher for Saudi nationality.

From Table 6, the results of the One-way ANOVA indicated that there were no significant differences in the critical care nurses' job performance. However, according to (Age, Marital Status, Education Level, Years of Experience, and Department/Unit), the P-values were higher than 0.05. Simultaneously, the One-way ANOVA results indicated a significant difference in the critical care nurses' job performance and (Nurse Rank) since the P-value was less than 0.05. And it was the highest for Nurse assistants.

Table 6 Occupational stress and the critical care nurses' job performance, according to demographic information and work characteristics

Socio-Demographic Characteristic		Occupational Stress			Critical Care Performance		
		Means	± S.D.	P-value	Means	± S.D.	P-value
Age	20-29	2.69	.96	0.701	3.22	.60	1.000
	30-39	2.55	.86		3.22	.67	
	40-49	2.40	.92		3.22	.55	
	50-59	2.33	.82		3.23	.27	
Gender	Male	2.21	1.21	0.437	3.31	.52	0.768
	Female	2.56	.88		3.22	.62	
Nationality	Saudi	2.81	.73	0.000**	3.04	.64	0.000**
	Non-Saudi	2.11	.95		3.53	.41	
Marital Status	Single	2.73	.88	0.047*	3.10	.60	0.506
	Married	2.46	.85		3.28	.63	
	Widow	2.10	.84		3.40	.46	
	Divorced	.63	.		3.08	.	
Education Level	Diploma	2.35	.90	0.049*	3.29	.63	0.492
	Bachelor	2.56	.88		3.22	.60	
	Master's Degree	3.14	.63		3.03	.71	
Nurse Rank	Specialist	2.67	.86	0.174	3.11	.65	0.044*
	Technician	2.40	.89		3.37	.52	
	Nurse Assistant	2.05	1.09		3.62	.51	
Years Of Experience	one year and less	3.01	.78	0.070	3.34	.37	0.573
	from 2-5 years	2.65	.91		3.05	.69	
	from 6-9 years	2.72	.90		3.24	.54	
	from 10-14 years	2.50	.82		3.21	.73	
	from 15-19 years	2.10	.79		3.38	.51	
	from 20 years or more	3.07	1.14		3.13	.43	
Department/ Unit	OR	2.12	1.03	0.132	3.09	.68	0.063
	ICU	2.63	1.09		3.28	.42	
	CCU	2.72	.62		3.56	.53	
	Burns Unit	2.45	.67		3.20	.74	
	ER	2.69	.65		3.06	.69	

Note. Values are reported as the mean± S.D. and analysed by a t-test or one-way Anova test. Abbreviations: SD= standard deviation, *, Statistically Significant (p <=0.05), ** = highly significant (p <0.01).

Correlations between the main factors and their sub-scales

According to (gender), the T-test results indicate no significant differences in the critical care nurses' job performance since the P-values were higher than 0.05. However, according to (nationality), the T-test results showed a significant difference in the critical care nurses' job performance since the P-values were less than 0.05. And it was higher for Saudi nationality.

The relationships between O.S. and the critical care nurses' performance were initially assessed utilising the Pearson correlational analyses in table 7. The following scales describe the correlation coefficients:

Size of Correlation	Interpretation
0.90 to 1.00 (- 0.90 to -1.00)	Very high positive (negative) correlation
0.70 to < 0.90 (-.70 to < - 0.90)	High positive (negative) correlation
0.50 to <0.70 (-.50 to < -0.70)	Moderate positive (negative) correlation
0.30 to< 0.50 (-.30 to < -0.50)	Low positive (negative) correlation
0.00 to <0.30 (-.00 to < -0.30)	Negligible correlation

Pearson correlation was used to study the relationship between the main factors of (O.S.) as independent factors that may affect the (critical care nurses' performance) as a dependent variable. See table (8) as it shows the significance level and correlation coefficients used to accept or reject the overall hypothesised model.

Table 8 Correlation matrix of the relationship between O.S. and the critical care nurses' job performance

Pearson Correlation		Stress	Critical Care Nurses' Performance
Stress	r	1	-.191*
	P-value		.043
Critical Care Nurses' Performance	r	-.191*	1
	P-value	.043	

Note. Values reported using Pearson correlational, Abbreviations: SS = statistically significant (*p= <0.05), HS = highly significant (**p= <0.01).

Table 8 indicated that the total correlation was (R= 0.191, R square= 0.034). So, O.S. had a 3% impact on the critical care nurses' performance.

The linear equation model:

$$Y= B+ a X+SE$$

Critical care nurses' performance= B + a (occupational stress) + SE

Critical care nurses' performance= 3.561-0.133 (2.55) + 0.175=3.40

Table 9 shows a significant relationship between O.S. and critical care nurses performance. Alongside a negligible correlation relation between them. They are confirming O.S. and nurses' performance relationship. Also, to declare a slight impact on each could be neglected.

Table 9 Simple Linear Regression for the impact of O.S. on critical care nurses' performance

Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.	R	R Square
		B	Std. Error	Beta				
1	(Constant)	3.561	.175		20.398	.000	0.191	0.034
	Stress Mean	-.133	.065	-.191	-2.051	.043		

a. Predictors: (Constant), occupational stress.

b. Dependent Variable: critical care nurses' performance.

Discussion

The study revealed that the O.S. of critical care nurses is frequently high (means above the average = 2.55). CCU had the highest O.S. level with a mean of 2.72, followed by E.R. and I.C.U. (2.69, 2.63, respectively). Whereas OR and Burn Unit had the lowest O.S. level, showing no significant relationship between O.S. and the nurses' assigned department. This result is consistent with previous studies conducted in Al-Riyadh, K.S.A., which revealed that the highest O.S. level was in the I.C.U. Department (SC, 2014). Similarly, other studies also showed that professional speciality and environmental factors are potential factors for the high O.S. in the I.C.U. Department (Ahmed, 2015; McVicar, 2003; Mokhtar et al., 2016). Contrary to the three studies, the higher O.S. rate was in the surgical and psychiatric departments (Al-Nabhani et al., 2016; Leveck & Jones, 1996; Safarpour et al., 2018). Another study reported a significant relationship between O.S. and nurses assigned to the department, showing that the surgical departments are the highest in the O.S. level (Al-Makhaita et al., 2014).

The results showed there was a significant relationship between their nationality, marital status, and educational level. Saudi nurses who were single with a Master's degree showed a higher O.S. level than the other nurses. These results both agreed and differed with the Ben-Bakr study. They coincided with the nationality factor being associated with O.S. since the Saudi nurses suffered from higher W.R.S. than the others but disagreed with it regarding the association with the nurses' educational level. The study concluded that the nurses with the highest academic qualifications were less susceptible to W.R.S. (Ben-Bakr et al., 1995). The nationality - O.S. association was probably caused by the respondents' characteristics since more than half of the respondents were Saudi citizens (62%). The results showed that Saudi nurses with high-stress levels have lower performance.

On the contrary, non-Saudi nurses with lower stress levels have a higher performance e. The effect of the COVID-19 Pandemic probably caused these differences since Saudi nurses have the pressure of preventing their families from infections and being isolated from them for an undetermined amount of time due to the epidemic. On the other hand, the majority of non-Saudi nurses were living alone in hospital dorms.

The study findings reveal no significant differences between O.S. and nurses' performance with the nurse assigned to the department/unit. It differs from several previous studies that have concluded a significant association between the department and work stress (Godwin et al., 2016; Nabirye et al., 2011; Safarpour et al., 2018). But it did agree with a study conducted on Al-Sudan performance (Mokhtar et al., 2016); Mohamedkheir et al. contradict the study result. They declared a significant correlation between O.S. and nurses working in I.C.U., showing the higher stress level in pediatric I.C.U., referring this results to the units' differences in work task and load, I.C.U. sitting, working environments, and exposer to different degrees of O.S. stressors (Mohamedkheir et al., 2016) s.

The results indicated that, in particular, the factor of death and dying is the influencing factor that increases nurses' O.S. level in critical care units the most (mean = 2.96). This result coincides with numerous previous studies (Batan, 2019; Chang et al., 2006; Ekedahl & Wengström, 2007; Gholamzadeh et al., 2011; Mokhtar et al., 2016; Vernekar & Shah, 2018). The high impact of the death and dying O.S. factor is

often related to the coronavirus pandemic. Another factor is the critical care department's unique features, such as dealing with uncertainty, violence, deaths, trauma, accidents, and life-threatening cases frequently (Healy & Tyrrell, 2011).

The study found that the nurses' O.S. level rises due to problems related to the supervisor, which came second as a factor. This result appears to be harmonious with Al-Hosis' study, which reported that Saudi nurses' O.S. level increased due to workload and reporting the problem to their supervisors (al Hosis et al., 2013) and then the patients and their families. This finding goes along with a study conducted in India where nurses described their conflict with patients and their families as a major stress factor (Kane, 2009). A study conducted in Al-Taif, K.S.A., reported that the main O.S. stressor for nurses were the demands and complaints of patients and their families (Kamal et al., 2012) and the workload. The results of the study conflicted with different studies conducted worldwide, that workload ranked first in causing work stress among nurses (AbuRuz, 2014; Batran, 2019; Chegini, 2019; Gholamzadeh et al., 2011; Kamal et al., 2012; McVicar, 2003; Moustaka & Constantinidis, 2010). These results may reveal that the nurses are well prepared for the epidemic, increasing their ability to endure a high-capacity workload. Besides, Makkah nurses have unique features and have been able to deal with a full-capacity workload during previous Hajj seasons. Lastly, discrimination is found to be occasionally stressful for nurses as the bias appears based on race and sex. A study conducted in South-West Finland concluded that discrimination increases absenteeism and O.S. among nurses (Kivimäki et al., 2000).

Furthermore, the study results show that the overall performance of critical nurses is frequently good. There is a significant relationship between nationality and a nurse's rank. A higher self-assessment of critical care performance showed by non-Saudi nurse assistants. This result could reflect that most participants in the study had 10 -14 years of work experience. The results show that the nurses' O.S. in critical care only has a significant negative, weak association with how well they perform their critical care nursing tasks. This result is partially compatible with the Safarpour study. It finds a significant correlation between the critical care nurses' O.S. with how frequently they perform their tasks and how well they perform their jobs (Safarpour et al., 2018).

The results revealed there is a significant negative, weak association between O.S. and critical care performance. These results are consistent with several previous studies (AbuAlRub, 2004; Nabirye et al., 2011; Safarpour et al., 2018). In K.S.A., Al-Homyan et al. study concluded that nurses' O.S. negatively impacts their performance. This study has particular nurses' performance dimensions. It evaluates the nurses' performance in six dimensions provision of information, technical care, interpersonal support, care coordination, volunteering for additional tasks. It was conducted in one region in K.S.A. without declaring this region information (Al-Homayan et al., 2013); When K.S.A., a large Kingdom with 13 provinces, has unique characteristics, environment, and culture. Also did not evaluate nurses' O.S. level, causing a dark spot on the public hospital nurses' O.S. and it is stressors. Al Qattan studied nurses O.S. in Jeddah city, the western region, through different healthcare sectors (governmental, other-governmental, and private). It is consistent with the previous study regarding the negative impact of the nurses O.S. on their performance. It declares a negligible correlation between nurses' O.S. and their performance, contrary to the previous research; it shows a nonnegligible low negative correlation (Al-Homayan et al., 2013; Qattan, 2017). Alqahtani & Zeilani conducted their study on 124 Operation Room Nurses in an other-governmental tertiary hospital in Khamis Mushayt city, Southern Region of K.S.A. shows a high nurses' O.S. level with a negative relationship with their performance. The O.R. nurses reported the highest stressor was related to managerial issues and less O.S. regarding nursing tasks. Also, the nurses evaluate their performance as the lowest performance in administrative assignments and ethical aspects (Alqahtani & Zeilani, n.d.). The previous results differed from the Mokhtar study, concluding that there is no significant association between O.S. and critical care nurses' performance (Mokhtar et al., 2016).

The study's linear regression results show that O.S. impacts critical care nurses' performance negatively by 3% only, which considers a weak effect on their performance. However, this impact increased when a sub-

scale was added (problems relating to the supervisors and discrimination); this affects the critical care nurses' performance; the effects percentage increased by 6%.

Conclusion

The study makes the following conclusions regarding the effects of O.S. on the performance of critical care nurses:

- 1- The O.S. of critical care nurses in the hospital was frequently high due to the number of deaths and problems related to their supervisors.
- 2- Critical care nurses had good performance skills in general, reflecting how well they dealt with current circumstances.
- 3- Saudi nurses have a higher stress level and lower performance, while non-Saudi nurses have lower stress levels and higher performance.
- 4- The study confirmed there was a weak negative relationship between O.S. and the performance of critical care nurses.
- 5- The main stressors that affect critical care nurses' performance are the problem related to supervisors and racial and sexual discrimination.

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