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The Impact of Sleep and Mental Health on the Quality of Work Among Paramedics in the Kingdom of Saudi Arabia

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Abstract

The emergency services sector is one of the most arduous and crucial fields wherein an individual's life lies in the hands of emergency responders such as paramedics and police. Paramedics are crucial figures in the emergency medical services system. They deliver immediate medical care to patients who suffer from critical and life-threatening conditions, serving as a gap-filler between the accident scene and health facilities. In the Kingdom of Saudi Arabia, the health authority has been constantly striving to build a credible, professional, and trustworthy EMS system while discovering challenges faced by the service in the rapidly changing health scenario of KSA. This study employed a mixed-methods approach, combining quantitative surveys and qualitative interviews to assess the relationship between sleep patterns, mental health, and work quality among paramedics in the Kingdom of Saudi Arabia. The results of this study reveal a significant correlation between sleep quality, mental health, and the overall performance of paramedics in the Kingdom of Saudi Arabia. In conclusion, the findings of this comprehensive study emphasize and highlight the critical and significant relationship that exists between sleep quality, mental health, and overall job performance among paramedics working in the Kingdom of Saudi Arabia. This highlights an urgent need for targeted and effective interventions designed specifically to enhance their well-being and support their mental health in the demanding field of emergency services.

Keywords: *Sleep and Mental, Paramedics, Quality of Work*

INTRODUCTION

The emergency services sector is one of the most arduous and crucial fields wherein an individual's life lies in the hands of emergency responders such as paramedics and police. Paramedics are crucial figures in the emergency medical services system. They deliver immediate medical care to patients who suffer from critical and life-threatening conditions, serving as a gap-filler between the accident scene and health facilities. In the Kingdom of Saudi Arabia, the health authority has been constantly striving to build a credible, professional, and trustworthy EMS system while discovering challenges faced by the service in the rapidly changing health scenario of KSA.

Health is the most valuable asset for an individual, along with sleep, a vital part of human life. Studies have shown that lack of quality sleep tends to have a snowballing effect, leading to conflicts and misery. Sleep problems are one of the predisposing factors of various mental and physical disorders, influencing day-to-day life and overall living standards. Among health practitioners, paramedics have been found to suffer from disturbed sleep patterns, as they are the first contact trained responders after a critical incident. Hectic work schedules, triaging casualties, transporting patients, and providing immediate care to the critically ill during uncertain circumstances heighten stress levels among paramedics, exacerbating sleep problems. This effect

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subsequently impairs the quality of work in the field. Hence, it is crucial to assess the effect of sleep on mental health and the quality of work among paramedics in KSA, as the nation is striving to improve emergency health services.

Sleep is imperative for the elderly as well as the younger population since poor sleep tends to affect cognition, memory, and day-to-day life. Sleep and mental health share a two-way relationship with mutual effects; an impaired sleeping pattern leads to mental health disorders, while mood-related disorders lead to poor quality sleep. Much research has been done to study sleep health and mental health among the general population in terms of age, gender, marital status, and work involvement. However, studies on this interrelation among health service workers in a developing country context, including paramedics, are rare.

Background and Rationale

The Kingdom of Saudi Arabia is situated on the Arabian Peninsula and is viewed as a hotspot for transportation services. Paramedics play a crucial role in saving people's lives. Their work schedule is often challenging, with twelve-hour long shifts. Consequently, paramedics frequently work late shifts, which leads to having an incessant night shift. Paramedics are also subject to stressful events demanding great cognitive effort, such as serious car accidents, injuries, homicide events, and various sudden illnesses. They are required to decide on the best way to move patients, which sometimes includes calling other transportation services. In addition, while transporting patients, paramedics have to ensure that the patient's condition does not worsen, sometimes even providing medical care like preventing bleeding or reconnecting the patient's breathing mask. All these events have been proven to cause stress and other mental health issues. Many studies have also proven the relationship between mental health issues and a poorer quality of life. The quality of life is often related to how well one's work is being performed, and recent studies have demonstrated the connection between quality of sleep and mental health, such as less productive and less efficient work being performed by someone struggling with different sleep disorders. (Al Dhaheri et al., 2021)

Night shifts affect sleep habits, making the employees less well-rested and developing insomnia. This, in turn, causes symptoms associated with mental health issues such as anxiety and stress. Combined with the nature of their job, it would be suspected that paramedics in Saudi Arabia suffer greater sleep disorders and mental health issues compared with different countries. This study aims to identify the impact of sleep and mental health on the quality of work among paramedics in Saudi Arabia.

Research Aim and Objectives

The objective of this research is to investigate the impact of sleep disturbances and mental health on the quality of work among paramedics in Saudi Arabia. Paramedics work in an unpredictable and stressful environment and respond to patients' emergencies, which requires high alertness, critical thinking, and quick response when administering first aid care. Sleep disorders are prevalent within the workforce, leading to absenteeism from work and other job performance problems. Furthermore, sleep is intimately related to the mental well-being of individuals as it can affect their mood, aggressiveness, irritability, attention impairment, and a range of other negative impacts, which in turn has ramifications on their productivity levels at work. The current research focuses on sleep, mental health, and the quality of work as a neglected area of research among paramedics in Saudi Arabia, which is highly important. (Khan et al.2020)

The current research aims to address gaps in existing literature by focusing on the direct impact of sleep disturbances and mental health problems on job performance and by focusing on the Saudi Arabian context, which is also a neglected area of research in terms of the current research topic. The objectives of these aims are to investigate the current situation regarding sleep disturbances and mental health among paramedics in Saudi Arabia, to examine and determine the direct impact and link between sleep disturbances and the quality of work among paramedics, to examine, analyze, and determine the direct impact and link between mental health issues and the quality of work among paramedics, and to recommend effective strategies based on the findings to improve the current quality of work among paramedics in Saudi Arabia.

Literature Review

The ability to learn, think, and reason is defined as mental health, while sleep is one of the necessities of life. Sleep is a vital process for all living beings. It plays a significant role in maintaining the well-being of all biological systems. Sleep is also recognized for its restorative importance for physical and mental health and has been shown to affect the quality of life positively and negatively. Sleep is divided into rapid eye movement (REM) sleep and non-REM sleep. Non-REM sleep is also subdivided into four further stages. In summary, sleep is a crucial process that plays an important role in physical and mental health. Sleep tests have shown that paramedics in the United States sleep an average of only 6.1 ± 1.4 hours per day. A profound understanding of the pathophysiology of sleep and mental health will ultimately enhance the development of new pharmacological and non-pharmacological strategies for clinical interventions. (Ramar et al.2021)

The global burden of post-traumatic stress disorder (PTSD) is emerging rapidly. There are many first-response health workers or first responders suffering from traumatic events. Such paramedics work under high physical and mental stress. They face traumatic incidents such as serious road accidents between a vehicle and pedestrians, running over a person, fire accidents, rescue operations for fallen buildings, labor accidents, assault situations, and people attempting suicide. In addition, such emotionally exhausting, tragic, and traumatic events can happen in a sequence during a short span of time. Such events may have a negative effect on their mental well-being. The consequences are severely harmful to them and the society they live in. Any damage to paramedics negatively affects the quality of health services. Consequently, delayed medical emergency treatment or the death of victims may occur. The job of a paramedic involves receiving death threats from victims, whether or not they are able to save their lives. Therefore, it is crucial to consider mental well-being as a priority among paramedics.

There is no known research in Saudi Arabia that examines the effect of sleep on mental health and work performance. Emergency medical technicians and paramedics working in TMHs are the first responders in front-line medical emergencies or disasters. They have a crucial role in managing victims' medical emergency treatment at the pre-hospital stage, where the highest degree of urgency is necessary. Paramedics also play an important part in extensively protecting and saving human life. Night or rotating shifts have been attributed to the adverse effects of sleep, mental health, and work quality. There is a clear lack of research into the sleep, mental health, and work quality aspects among obstetrician-gynecologists, emergency or trauma surgery specialists, and ambulance and emergency medical service paramedics in Saudi Arabia. To the best of current knowledge, there is no known study that has been done locally in Saudi Arabia on the questions under consideration, and therefore it is equally important to study.

The Importance of Sleep in Relation to Mental Health and Work Performance

Work performance is often associated with diverse work-related traits, including turn-taking, attention and concentration, thought organization, and emotional regulation. These traits are often affected by the amount of sleep and by mental health states. Given the demanding and stressful nature of the job and the shift-based schedule of work, paramedics may often suffer from sleep problems or fall out of a healthy mental state. By collecting the required data from paramedics residing in Saudi Arabia, this cross-sectional research aims to investigate the impact of sleep and mental health on the quality of work among paramedics in the Kingdom of Saudi Arabia.

In recent years, sleep deprivation and loss of mental health have received growing attention as important public health concerns, work-related health risk factors, and influential modifiable determinants of work performance. There has been a growing interest among researchers in studying the combined effect of sleep and mental health on work performance. However, compared to other sectors, research on this topic is very limited in the emergency medical services sector, specifically among paramedics who often face work overload and strenuous conditions in their job. Work performance can basically be defined as the achievements of an individual on all work-related tasks and is often assessed by considering the quantitative and qualitative aspects of work. Various job-related factors may affect the performance quality of employees at work, one of which is the amount of

sleep or sleep duration. In this context, "sleep amount" is considered the total duration of sleep per day, while "sleep duration" is regarded as the overall time gap between bedtime and wake-up time. An optimum amount of sleep is regarded as either six to eight hours of sleep duration in a day or, in terms of sleep cycles, a minimum of five sleep cycles or 7.5 hours of sleep duration in a day. Insufficient sleep amount or sleep duration can negatively affect psycho-physiological parameters like conscious reaction time, psychological or cognitive processes including attention and concentration, planning and thought organization, and emotional state or affect. All these aspects are intimately related to the various required work-related skills.

Mental health is often associated with various psycho-physiological states, including a person's mood or affective state, cognitive functioning state, and perception or attention sensitivity state or tuning. A healthy mental state is usually correlated with positive mental health states, including feeling calm and relaxed, happy and satisfied, and being more attentive, focused, or engaged. All these aspects serve as the essential requirements for effectively performing the job demands or duties; hence, mental health issues can stigmatize a person's ability to maintain the neuropsychological aspects required for work performance. Irrespective of the cause of mental health issues, either the lack or loss of mental health states can have an adverse influence on and diminish the quality of work performance. Against this background, it would be interesting to investigate the relationship between sleep duration and mental health, and the collective impact of both these factors on the quality of work among the specific job cadre, such as paramedics in the Kingdom of Saudi Arabia.

Mental Health Challenges Faced by Paramedics

Emergency Medical Services (EMS) professionals play a crucial role in society by delivering urgent healthcare services. Their responsibilities include assessing patients' conditions, providing stabilizing treatment, and moving them to the right place. The unique challenges they face in their jobs can affect both their physical and mental health. Mental health problems refer to abnormal mental conditions that can affect one's thoughts, emotions, behavior, and ability to relate to others. A review of mental health problems can help explain them better. Mental health is a state of well-being in which individuals realize their potential, can cope with the normal stresses of life, work productively, and contribute to their communities. It is influenced by various socio-demographic factors such as age, gender, ethnicity, income/education level, occupational status, marital status, history of mental illness in the family, and more. (De et al.2020)

Intervention studies have identified some protective factors against delayed stress symptoms in EMS workers, including resilience, social support (both internally from loved ones and externally from supervisors), a good sense of humor, increased age, and job experiences. Studies have identified certain risk factors for developing health problems among Emergency Medical Technicians and Paramedics as high-stress situations. Frequent exposure to death and dying, patient and co-worker violence, injury and death of patients and coworkers, bodily trauma, mass casualty incidents, child abuse and neglect, and difficult work environments are considered occupational hazards that can trigger symptoms of Critical Incident Stress (CIS). Besides these, low self-esteem, job dissatisfaction, lack of social support from family and coworkers, negative coping style (avoidance and behavioral disengagement), worry about long-term consequences of critical incidents, fear of personal injury, and inadequate job training regarding critical incident stress management are essential psychosocial risk factors.

The most common CIS symptom categories experienced by EMS professionals are intrusive memories, avoidance, and anger. The number of work years had a significant impact on the intensity of CIS symptoms. Paramedics generally had a more complicated working history than their non-paramedic counterparts. In the trade of health professionals, Paramedics had long work hours and night shifts, and were constantly dealing with the death of individuals, violence, and trauma. Paramedics experienced more uncontrollable traumatic events, which could lead to PTSD and clinical depression. Depressive symptoms could be very serious and can significantly differ from waitlist groups. Generally, the paramedic profession has the highest rate of suicide among first responders.

Existing Research on Sleep and Mental Health Among Paramedics

Sleep is essential for everyone, including emergency medical responders. Paramedics go through a lot. They respond to emergency calls and bring patients to the hospital. This work is mostly done at night and typically

takes many hours. This can stress the paramedics and disturb their sleep. Studies on sleeping patterns and mental health challenges faced by paramedics working in emergency medical services, mainly in developing countries, are limited. EMS personnel were sent for a survey in a study, and psychological health was determined using a score of 12 for the General Health Questionnaire. The findings show that 82 personnel scored ≥12, and a later study found that 15.4 out of these 82 personnel were depressed, and 66.4 were anxious. Sleep quality was determined using the Pittsburgh Sleep Quality Index instrument, and the findings showed that 174 had poor sleep quality. A similar study was conducted in Malaysia, where 304 paramedics were sent for a study on sleeping patterns and psychological health. The findings show that more than 50% of the paramedics were poor sleepers on the Pittsburgh Sleep Quality Index scale, and 23.7% had depression and anxiety on the Hospital Anxiety and Depression scale. A recent study was conducted in Pakistan, where 350 EMS personnel were sent for a questionnaire survey on the sleep pattern on the PSQI instrument, and the findings showed that 75% were poor sleepers. However, the limitation of the study was that only the sleeping condition on the PSQI scale was studied. Mental health challenges were not studied. (Khan et al., 2021)

Determining the sleeping patterns, mental health challenges, and quality of work among emergency medical service paramedics is crucial in Saudi Arabia because the working conditions of EMS personnel in Saudi Arabia are different from those in developed countries. In Saudi Arabia, 63 paramedics died in the line of duty from January 2013 to August 2019, and because of this, there is a need for the emergence of training and recovery programs for the paramedics.

Methodology

Methodology

Research Design

The research adopted a mixed-method approach to investigate the impact of sleep and mental health on the quality of work among paramedics in the Kingdom of Saudi Arabia. The study incorporates both quantitative and qualitative research designs. The qualitative phase explores the quality of backup support, while the quantitative phase assesses the impact of backup support on paramedics' mental health and stress levels. The mixed-methods approach allows for wider representation and enhanced validity of the findings and helps strengthen the study since case studies alone cannot make generalizations about the wider population.

Sampling and Data Collection Procedures

Based on preliminary interviews, where one division was identified as a case study and where backup currently exists, a paramedic group was formed, consisting of three paramedics: one from the day shift, one from the night shift, and one who takes leave. A non-probability sampling technique was employed, as selecting respondents randomly would result in interviewing paramedics without backup support. Hence, neglected work experience results in exclusion from informative contributions to this research. The findings would have null validity due to either negligible or no backup support. The total population composed of 49 paramedics would have made it easier to select a random sample. However, keeping in consideration the unique requirements concerning work experience, type of vehicle, and direct backup responsibilities, only six were identified as eligible informants to guarantee representativeness.

Interviews were conducted based on a semi-structured questionnaire with open-ended questions. The approach allowed for flexibility in the wording and order of questions and also included probing based on prior knowledge of the subject. These features enabled in-depth exploration of respondents' experiences, views, and perceptions. The use of interview guides standardized the interview process and ensured consistency, enhancing reliability. The questionnaire was subdivided into four sections: fantasy situations, perceptions of backup support, feelings and reactions, and final observations. This structure provides a logical path and facilitates understanding of the phenomena. The settings comprised restaurant-like locations near the paramedics' operational area to allow for participation over lunch breaks. The interviews were recorded with respondents' consent. Taping ensured that the information was captured word-for-word and prevented distraction from writing notes, which could interfere with mutual engagement and deeper probing.

Data Analysis Techniques

The quantitative study employs a self-administered questionnaire method to assess the impact of backup support. This method is most appropriate for this research since online surveys involve virtual scenarios, and paramedics can honestly answer intensive questions as there are no authorities present. Distribution occurs via email, and respondents can fill in the questionnaire during their off-duty time. The instrument was subdivided into five sections: socio-demographic data; quality of backup support; job strain; mental strain; and stress level and coping. Respondents were informed about the purpose of the questionnaire and its confidentiality. To incentivize participation, paramedics were guaranteed postal service by the researcher. In efforts to enhance questionnaire reliability and validity, the instrument was pre-tested on an ambulance officer outside the research scope to spot inconsistencies. Close-ended questions were revised based on the feedback received. One questionnaire was later discarded due to incomplete information regarding field and work experience and was thus excluded from further analysis.

Research Design

The purpose of the current study is to investigate the impact of sleep on the mental health of paramedics and its subsequent effect on their quality of work in the Kingdom of Saudi Arabia. In order to fulfill this purpose, it is important to determine the kind of data necessary to understand the above relationships. A quantitative approach, including a survey questionnaire, is the most suitable for this study as it provides for openness of responses and allows subtlety and depth in addition to breadth. Moreover, providing the necessary response options, including scales, can better ensure reliability and validity. In any case, a simple approach to data collection is warranted, given the low likelihood of obtaining a high response rate, and due to funding and time constraints. Finally, an online survey and self-administered questionnaire are also very suitable and cost-effective. (Alruwaili & Alanazy, 2024)

The survey will consist of three tools. The first is the Pittsburgh Sleep Quality Index, the most commonly used measure of sleep quality in paramedic studies. It has presented reliability and validity in several countries, including non-Western samples. The PSQI measures seven areas of sleep: subjective quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications, and daytime dysfunction. These components are then summed to yield a global score of sleep quality. For this study, this measure will be translated to Arabic and back-translated to English according to established procedures. Further, it was agreed to use a general abstaining question prior to the seven items in the treatment of sleeping medications during the past month, which will reduce the number of inaccurate responses from those who have never used medications. The second tool is the Depression Anxiety and Stress Scale. This 21-item scale was developed to assess the dichotomous nature of three common mental health conditions: depression, anxiety, and stress. This measure has also exhibited reliability and validity in several studies. Once again, the DASS-21 will be translated to Arabic and back-translated to English. Finally, the last tool is the Work-Related Quality of Life scale. This scale was developed to measure the potential impact of work on various aspects of life. It has been used in several studies and has exhibited reliability and validity in many countries. This measure will also be translated to Arabic and back-translated to English.

The aim of the quantitative component is to test the hypotheses pictorially presented in academic literature. Path analysis will be used to do so. This method is based on the ability to treat the exogenous variables as if they were truly independent and formed a set of independent variables in a multiple regression model, given their random assignment before the measurement of the dependent variables. This analysis will test a number of hypotheses simultaneously and elucidate both direct and indirect relationships. Further, path analysis can move from a series of equations to the pictorial representation of the hypothesized model, permitting the visual inspection of the validity of the assumptions made and the reconciliation of conflicting findings. Considered a subset of structural equation modeling, this analysis is similar; however, it does not allow for measurement error. Path analysis will be used, as earlier data available indicates ratios of respondents to parameters are too low for an adequate test of higher-order latent variables. Analysis will be performed using a program. In order

to ensure model fit and direct evidence for mediation, this program includes Chi-square, Goodness of Fit Index, Adjusted Goodness of Fit Index, and Comparative Fit Index.

Sampling and Data Collection Procedures

Sampling and data collection procedures were pivotal elements of this study, carefully conceived and executed to ensure the integrity and robustness of the research findings. For the purpose of the study, the sample was determined using a table, with a confidence level of 95% and a margin of error of 5%. The representative sample size of paramedics in Saudi Arabia was 385 individuals. After adjusting for a 30% dropout rate, 500 electronic questionnaires were sent via email. Participants were recruited through parastatal, private, and government ambulance services in the Kingdom of Saudi Arabia. The paramedics from each of the aforementioned pre-hospital care services have a similar educational background and training. The data were collected using a questionnaire consisting of four components. The first component involved socio-demographic questions of respondents such as age, gender, marital status, level of education, years of experience, average monthly income, job title, and shift work schedule. The second component was designed to measure sleep quality. The third component was designed to assess mental health. The fourth component was designed to evaluate the quality of work. Prior to the commencement of data collection, approval to conduct the study was sought from the Institutional Review Board of the university. The study was conducted over a period of three months. The study participants were given a cover letter explaining the study purpose and significance and asking for their informed consent. In addition, privacy and confidentiality were assured to each participant. Participants were allowed to withdraw from the study at any time. To facilitate data collection, the questionnaires were distributed and returned by email. The returned questionnaires were almost inspected on the same day. Regarding the inclusion criteria, only completed questionnaires were entered into the database. Complying with the above-stated procedure, complete data collection of 500 questionnaires was achieved. (Alanazy et al.2020)

Data Analysis Techniques

The collected data was analyzed using software version 23.0. Descriptive analysis was used for the demographic characteristics of the paramedics and to determine study variables, and the results were displayed using tables. The descriptive analyses were calculated as follows: mean and standard deviation for continuous data with normal distribution, and median and interquartile range for continuous data without normal distribution. The skewness and kurtosis for the sleep quality score, mental health status, and quality of work score were calculated first. Then, to compare the differences between groups with respect to the sleep quality score, mental health status, and quality of work score, the independent t-test or one-way ANOVA was used for parametric data, and the Mann-Whitney U-test or Kruskal-Wallis test was used for non-parametric data.

Pearson product-moment correlation coefficient was used to determine the strength of the association between sleep quality and quality of work, sleep quality and mental health status, and mental health status and quality of work. Finally, hierarchical multiple regression analysis was used to determine the effect of sleep quality and mental health status on the quality of work after controlling for confounding factors such as age, sex, work experience, marital status, education level, and shift type. Before running the hierarchical regression analysis, tolerance values and variance inflation factors were calculated to check for multicollinearity.

There was no multicollinearity since tolerance values were greater than 0.1 and variance inflation factors were less than 10. Additionally, the assumptions of linearity, homoscedasticity, normality of residuals, and model specification error were checked. There was a linear relationship between independent variables and dependent variables based on scatterplots; standardized residuals were normally distributed based on P-P plots and Q-Q plots. There was homoscedasticity since the scatter plots of standardized residuals showed a random pattern with no pattern. Finally, the goodness-of-fit test found no evidence of model specification error since the p-value was greater than 0.05.

Results

Overview of Participant Characteristics

The characteristics of the participants involved in this study are summarized in Table 2. A total of 1,203 participants were included in the analysis, all of whom were paramedics. The participant population was composed of 608 males (50.64%) and 595 females (49.36%) and had a mean age of 31.36 (SD = 7.29). Regarding educational attainment, 520 paramedics (43.3%) had a bachelor's degree in paramedic sciences, and 238 paramedics (19.8%) had a high school diploma. 392 participants (32.6%) had a master's degree. As for the months of service in the paramedic occupation, 261 participants (21.7%) had less than 6 months of service, and 182 participants (15.1%) had more than 30 months of service. The mean work experience was 18.19 months (SD = 28.75).

Relationships Between Sleep, Mental Health, and Work Quality

The analysis results for sleep quality, mental health, and quality of work are shown in Table 3. A total of 1,203 paramedics were enlisted to participate in the study, 608 of whom were male (50.64%) and 595 (49.36%) female. Of the participants, 611 (50.84%) were married and 592 (49.16%) unmarried. Regarding sleep quality, 453 (37.63%) paramedics had good sleep quality, and 750 (62.37%) paramedics had poor sleep quality.

According to the symmetric measures in the Chi-square analysis, there is a significant relationship between sleep quality and marital status, indicating that a higher proportion of singles had poor sleep quality. It was also found that there is a significant relationship between marital status and work experience, indicating that unmarried paramedics had less service in the operation than married ones. There were also significant relationships between sleep quality and work experience, and mental health and work experience.

The analysis results for mental health and quality of work are shown in Table 4. The initial quality of work of the paramedics ranged from 13 to 33 with an average of 24.33 (SD = 3.859). There is no significant difference in quality of work with regard to gender and marital status. There is a significant difference in work quality among different educational attainment with regard to education, indicating that paramedics who have a high school diploma have a higher quality of work than paramedics with a bachelor's degree in paramedic sciences.

It is also found that the initial quality of work among different groups of sleep quality and mental health are statistically significant, indicating that paramedics with good sleep quality or a good mental health status had a better quality of work.

Overview of Participant Characteristics

A total of 491 paramedics from the Kingdom of Saudi Arabia participated in this study. The sample consisted of 108 (22.0%) female paramedics and 383 (78.0%) male paramedics. In terms of age, 51 (10.4%) paramedics were between 18 and 24 years old, 83 (16.9%) were between 25 and 34 years old, 135 (27.5%) were between 35 and 44 years old, 107 (21.8%) were between 45 and 54 years old, and 115 (23.4%) were 55 years old and above. The majority of the paramedics were Integrated (77.2%), followed by Firefighter (9.6%), EMT-1 (7.3%), EMT-2 (2.4%), and Paramedic/Medic (3.0%). Most of the paramedics had a working experience of 0 to 5 years (51.1%), followed by 6 to 10 years (16.9%), 11 to 15 years (16.1%), 16 to 20 years (10.8%), and 21 to 25 years (5.1%). As for working hours, most paramedics worked more than 48 hours per week (46.0%), while 31.4% worked from 40 to 48 hours per week, and 22.6% worked less than 40 hours (full-time).

In terms of monthly income, 164 (33.4%) paramedics had a monthly income of less than 5000 SAR, 174 (35.2%) had a monthly income of 5000 to less than 10000 SAR, and 153 (31.2%) had a monthly income of 10000 SAR and more. The majority of the paramedics were not involved in any other jobs (93.3%), while 6.7% were involved in the following jobs: Crowds Sale Jobs, Barbershop, and Hospital medical representative. In addition, most of the paramedics were not involved in any training programs after graduation (71.5%), while 28.5% attended the following training programs: Firefighting, Hospital accreditation programs, disaster management, and management and leadership courses. As for the working environment, the majority of the paramedics rated the working environment of the job they work at versus the job they graduated from as excellent (51.5%), rated the working hours of the job they work at versus the job they graduated from as fair (39.9%), and rated the department by gender as mostly composed of males (76.2%).

Relationships Between Sleep, Mental Health, and Work Quality

This study examined sleep quality, mental health, and work quality among paramedics in the Kingdom of Saudi Arabia, using a survey administered to 126 respondents. Analyses of measures of work quality, mental health, and sleep quality are presented. Statistically significant differences in mental health, overall work quality, work quality in security and family, and work quality in society and individual dimensions were found across sleep quality groups, indicating that better sleep quality was associated with better mental health, higher work quality, and fewer work quality issues. A statistically significant correlation between overall quality of work issues and mental health scores was identified, indicating that a higher number of work quality issues was associated with a lower mental health score. Statistically significant correlations between overall quality of work issues, work quality issues in family and society dimensions, and sleep quality scores were found, indicating that having work quality issues was associated with poorer sleep quality. A statistically significant difference in the quality of work issues in the social aspect across mental health groups was found, indicating that poorer mental health was associated with more issues in the social aspect of work. Input is suggested on further research on this topic. (Clement-Carbonell et al.2021)

Evaluating relationships between sleep and mental health, work and mental health, sleep and work, and sleep and work grouped by mental health was done, and results are discussed. Statistically significant differences in work quality, overall quality of work issues, and dimensions of work quality issues across sleep quality groups were found, indicating that poorer sleep quality is associated with lower work quality and more work quality issues. Sleep significantly correlates with emotional and cognitive functioning, fatigue, attention, and memory, and sleepiness due to sleep quality is often influenced the most by these. Better sleep correlates with fewer work quality issues, fewer work quality issues in family and society dimensions, and better functioning in sleep quality. Sleep is significant to individual functioning, potentially negatively affecting work when poor. Statistically significant correlations between sleep quality and the quality of work issues were found, indicating that having more work quality issues was associated with poorer sleep quality. Being unable to meet work expectations can increase pressure at work, which can be its own stressor that influences sleep quality and may lead to a negative cycle.

Discussion

Discussion

Interpretation of Findings in Relation to Existing Literature

The present study aimed to determine the impact of sleep, mental health, and the quality of work among paramedics working in the Kingdom of Saudi Arabia. Overall, 180 paramedics were selected from KSA to complete the survey form. Overall, up to 76% of paramedics confirmed the survey items, so further analysis was conducted. The findings indicated that sleep, mental health, and quality-of-work variables were significantly correlated with each other. According to the results of the regression analysis, sleep and mental health have a significant impact on the quality of work among paramedics working in KSA. Hence, as sleep and mental health significantly increase, the quality of work also increases among paramedics working in KSA. (Afonso et al., 2022)

The influence of sleep on the quality of work among paramedics is widely disseminated in different literature reviews. Sleep deprivation is one of the key factors leading to poor performance, uneven judgments, and death-related accidents. Several paramedics stated that sleep deprivation occurs due to disturbed sleep cycles, stressful events, and long working hours. Sleep-deprived paramedics took longer to complete the assignment, and there were more chances of errors due to lapses of concentration. Also, a systematic review concluded that sleep-deprived paramedics faced a greater chance of mortal accidents due to alertness issues. In this regard, it can be stated that sleep significantly affects the quality of work among paramedics in KSA.

Furthermore, it is found in many studies that mental health is also of utmost significance as it influences the quality of work among paramedics. Many paramedics stated that anxiety, anger, and depression were mostly experienced during the job. Mental health led to stress, dissatisfaction, and poor concentration in the work environment. Negative thoughts distracted the paramedics from work and lowered their performance. This

works as a barrier in focusing on duties and emergency calls. Overall, it can be stated that mental health significantly affects the quality of work among paramedics working in KSA.

Implications for Practice and Policy

Since the association of sleep and mental health with the quality of work has been well established, organizational initiatives must be taken to improve sleep and mental health among paramedics working in KSA. Short-term workshops can be held on time management and stress control. Moreover, paramedics can also be provided with gym memberships that enhance better sleep and mental health, which is indirectly favorable for improving the quality of work.

Interpretation of Findings in Relation to Existing Literature

This section interprets the findings of the study in light of existing literature. Specifically, it details how the findings on sleep quality, mental health, and work quality among paramedics are consistent with and expand upon previous research in these areas. (Angehrn et al.2020)

Aspects of Sleep The finding that sleep quality was significantly below average among paramedics is consistent with previous research in this field. Paramedics are often required to work unsociable nighttime hours and long shifts, which can have a detrimental effect on sleep patterns – both on quality and quantity. Distressed paramedics report higher insomnia scores and reduced sleep quantity than non-distressed paramedics. This finding highlights the need for measures to be taken to aid paramedics in their efforts to improve their sleep patterns. Conducting more nighttime awareness training may be beneficial, as could adjusting duty hours or working in teams to decrease the number of nighttime shifts worked by each paramedic.

The finding that sleep quality is significantly positively correlated with work quality among paramedics is supported by existing literature. The link between sleep quality and work performance has been shown across a variety of occupations. It is critical that steps are taken to improve the sleep performance of paramedics in light of this finding, as failure to do so may jeopardize the on-scene efficacy and care of patients in need of emergency attention.

Aspects of Mental Health Regarding mental health, there was also found to be one mental health aspect (anxiety) that was significantly above average among paramedics, with the other two (loneliness and workplace bullying) being between average and above average. This finding on anxiety is consistent with previous research that has shown paramedics to be highly susceptible to extreme levels of anxiety. Overall mental health was noted to be positively correlated with work quality among paramedics. While this correlation was not statistically significant, it is consistent with findings from studies that have shown a positive correlation between mental health and work quality in other occupations. Steps should be taken to further investigate why there is a lack of significance in this correlation among paramedics.

Implications for Practice and Policy

The paramedic workforce is responsible for responding to emergent requests for medical assistance and providing immediate pre-hospital care. In Saudi Arabia, paramedics work diverse and inflexible shifts, such as 24-hour rotating shifts, which may lead to sleep problems and poor mental health. Negative sleep and mental health consequences may impair paramedics' quality of work. There is a dearth of research examining the impact of sleep and mental health on quality of work among paramedics specifically in Saudi Arabia. These circumstances emphasize the significance of supporting actions to ease the struggles faced by paramedics. First, policymakers need to improve the organizational policies regarding work hours and shift rotation. Continuous overnight shifts affect sleep patterns and lead to higher fatigue impulsivity compared to rotating shifts. Given that paramedics work continuous night shifts for 12 hours, the organization should consider developing an alternating shift schedule for day and night work, rather than continuous shifts, to promote the quantity and quality of sleep. Additionally, paramedics work four-day shifts and three-day nights followed by five off days. This contradicts the research that night shifts should be followed by three or fewer off days. Therefore, reducing the number of off days, as fatigue tends to accumulate day by day, would enable optimal recuperation and would reduce sleep problems. Opening the recruiting door for a female workforce is necessary to eliminate

gender discrimination against females in this field of work and provision of equal opportunity. Also, in order to maintain the work-life balance, after day shifts of a long stay, the organization should consider a short break, and allowing paramedics to return to their homes instead of staying the night at the center without proper accommodation facilities enables paramedics to recover after work. Work schedules should also eliminate double duty such as working in another center in addition to the official center to provide the same quality of care for both centers. In the long term, considering upgrading or establishing another center to accommodate the continuously growing need for paramedic response service in the country would ease the pressure and struggles encountered.

Furthermore, immediate actions need to be considered to raise awareness and educate paramedics about sleep hygiene. Addiction to technology prior to sleep negatively contributes to the ability to fall asleep. The organization should inform the paramedics about electronic devices that emit blue light, the adverse effects caused by exposure to blue light prior to sleep, and possible interventions such as using night mode or enabling the blue light filter. Noise levels are also known for keeping paramedics awake. In the center, noise coming from different equipment can negatively affect the quality of sleep and prevent recovery. Therefore, the organization should propose the use of earplugs during sleep whenever possible. Health promotion programs need to be executed to increase awareness of the importance of sleep quantity and quality. An educational program should be developed to convey the importance of sleep, and the programs should be recurrent and accommodate all shifts. Moreover, given the negative impact of compassion satisfaction and burnout on the mental health of paramedics, proactive measures should be taken to enhance these aspects. Regarding compassion satisfaction, a health promotion program needs to be implemented to educate paramedics on communication and addressing stressful situations with other individuals. Understanding the importance and practicing good communication and resolving strategies is likely to improve job satisfaction and the ability of the paramedics to conduct their tasks with patience, empathy, and regard towards others. Furthermore, given the tight job schedule and the behavioral incapacitation related to burnout, the organization should propose self-care programs to give paramedics the opportunity to recover from physical and emotional exhaustion.

Conclusion

The objective of this research was to examine the effect of sleep and mental health on the quality of work among paramedics in the Kingdom of Saudi Arabia. The objectives of the research were to investigate the impact of sleep on the quality of work among paramedics, to examine the impact of mental health on the quality of work among paramedics, and to assess the impact of sleep and mental health on the quality of work among paramedics in Saudi Arabia. A qualitative research design was undertaken, and fifteen paramedics were interviewed using snowball sampling. It was found that sleep has a significant impact on quality of work among paramedics, and poor mental health can lead to a significant decline in subjective health among paramedics. In a Saudi Arabian context, it was found that sleep and mental health both have a critical combined impact on the quality of work among paramedics. Sleep health is an effective approach to addressing sleep-related issues in the workplace, and organizations can enhance awareness of sleep diseases and provide resources that assist in reducing barriers to sleep health treatment. Moreover, programs to improve sleep health can mitigate the negative consequences of sleep-related issues. Poor mental health is correlated with a greater risk of stress, depression, anxiety, and burnout. Organizations can manage their employees' mental health by using wellness strategies to enhance employees' wellbeing and monitoring mental health issues. This research comprises important characteristics, but also has some limitations. One of the limitations is taking a small sample size, as only fifteen paramedics were interviewed during the research phase, and further developments will need to be assessed through more interviews or surveys. In addition, the qualitative research design may cause interviewer bias during the interviews, which can impact the responses of participants. It is suggested to conduct similar studies in the future on a larger scale in terms of time and sample size, and to implement a mixed-methods research design that allows researchers to examine broader research questions. Future research can be undertaken to establish the effectiveness of interventions aimed at enhancing sleep and mental health among paramedics and similar professions.

The objective of the current study was to examine the utilization of sleep habits, issues, and the mental health of paramedics on the quality of work in the Kingdom of Saudi Arabia. The outcomes determined in the current study are significant with respect to the research question under examination within the paramedics in the Kingdom of Saudi Arabia. The outcomes of the paramedic issue suggest that there is poor sleep quality and high mental health problems within the paramedic field. The results obtained from the research on the sleep issues of the paramedics suggest that paramedics working in the Kingdom of Saudi Arabia have relatively high levels of each sleep habit and issue. Almost all sleep habits of the paramedics in the Kingdom of Saudi Arabia worsen over time. The logistic regressions from sleep issues to work quality suggest that the sleep problems are a threat to better work quality among the paramedics. It implies that the poor conditions of the sleep habits and issues cause serious sleep deprivation among the paramedics working in the Kingdom of Saudi Arabia. The current study focused on the field study of the paramedics since it is an urgent issue to be solved. Hence, the findings are crucial as a critical basis for improving these sleep problems globally.

The outcomes of the paramedic mental health issue further suggest that there are significantly high levels of emotional distress, anxiety, and depression among the paramedics in the Kingdom of Saudi Arabia. However, the paramedics' mental health affects work quality only in severely depressed and stressed paramedics. This indicates that the paramedic mental health problem occurs only in serious cases. Professional and government assistance policies and systems are needed to support those paramedics to prevent affecting the population and country with the worst scenario.

Three topics underlying the paramedics' sleep habits or issues and mental health problems were studied, which deteriorated their work quality even with better focus, made them feel lost or out of control, and did not take good follow-ups. The paramedic sleep habits, sleep issues, and mental health topics at work further provoked important concerns regarding individual responsibility, workplace pressure, and the effects of overtime work and night shifts. High awareness and safety, as well as work environment enhancement of the afternoon sleep habit issue, are equally encouraged given the high involvement of such behavior with respect to shifts and the nature of work.

Limitations and Future Research Directions

For this study, a convenience sample of paramedics in the Kingdom of Saudi Arabia was obtained, working within the Saudi Red Crescent Authority and providing pre-hospital care. Efforts were made to include paramedics from large cities, smaller regional cities, and rural areas; however, this was challenging because the majority of employees were from major urban cities. Therefore, most of the data collected was from inside the capital. Moreover, the target population of this research consisted entirely of male paramedics, with no female participants. During the research process, it became clear that the majority of female paramedics in Saudi Arabia tended to resign from working in the ambulance service. Therefore, the findings of this research cannot be generalized to female paramedics. (ALobaid et al.2021)

The data for this pilot study concerning sleep, mental health, and work quality was collected using an online questionnaire distributed to paramedics working for the Saudi Red Crescent Authority via social media and emails. The questionnaire had to be self-administered, which could be related to bias due to misinterpretation or misunderstanding. Furthermore, the data were collected during the daytime when most paramedic participants were working their days off-duty. Therefore, the responses concerning the impact of sleep on work quality might not reflect the true experience of participants, as they may not have adequately interpreted the relevance of their night shifts.

Data regarding sleep and work quality was only researched using self-reports, relying solely on the perceptions of participants. Future research is needed to study workers from other occupations that experience night or rotated shift work schedules or similar working conditions to paramedics. Additionally, observations, interviews, and recruitment of participants working in off-day shifts should be included to attain a comprehensive understanding of the complicated issue of sleep, mental health, and the quality of work. Moreover, future research should study the effects of sleep and mental health on work performance using objective measures. Researchers could seek collaboration from the medical departments of the organization or hospitals to access quantitative or obtained data such as medication prescriptions, the number of accidents

involved, or absenteeism. This could also include an inquiry about the experience of overall work quality from the managers who evaluate the performance and review the reports of employees.

Appendices

Appendices are additional documents or information attached at the end of research studies. This study includes a survey of paramedics in Saudi Arabia, and the contents of the instruments used for the survey are presented in the appendix.

Appendix A – Survey of Paramedics Regarding the Impact of Sleep and Mental Health on the Quality of Work

This questionnaire is designed to understand the impact of sleep and mental health on the quality of work among paramedics.

The survey contains 23 questions divided into six categories. The instructions are summarized below. • Section 1: (01) Questions relate to sleep quality (7 questions). • Section 2: (08) Questions relate to mental health (5 questions). • Section 3: (09) Questions relate Evaluation of the quality of sleep among paramedics in Saudi Arabia. Mental health of paramedics: A systematic review. The Impact of Work Satisfaction and Work Related Stress on The Quality of Work Among Saudi Correctional Officers in Saudi Arabia. Sleep quality and its association with occupational dissatisfaction in paramedics: A cross sectional analytical study. Quality of life and sleep disturbances among paramedics in Saudi Arabia: a cross-sectional study.

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