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Master Program in Intensive Care Nursing

Anxiety Levels and Sleep Quality Among Palestinian Patients in Adult Critical Care Units: A Descriptive Study on The Use of Non-invasive Ventilation

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Thesis Approval

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Declaration

I declare that, except where explicit reference is made to the contribution of others, this thesis is substantially my own work and has not been submitted for any other degree at the Arab American University or any other institution.

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Dedication

I dedicate this thesis to my beloved parents, whose endless love, support, and sacrifices have been the foundation of my success. Your unwavering belief in me has been my greatest motivation, and I am forever grateful for everything you have done. My dear brothers and sisters, who have always been my source of strength, encouragement, and unconditional support. Your love and belief in me have given me the confidence to keep pushing forward.

To my second family, my wonderful friends, and friends of this journey, who have been with me through joy and sorrow, through hardships and ease, and by my side through every challenge. Your presence has been a source of comfort and strength, and I deeply appreciate each one of you.

To Birziet University, my first academic home, where my passion for learning was nurtured, and to all my esteemed teachers at the Nursing College, whose guidance and dedication have shaped my journey.

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Abstract

Introduction: Worldwide, respiratory disorders are a major cause of morbidity and mortality, frequently requiring treatments like non-invasive ventilation (NIV). While its respiratory benefits are well-documented, its psychological and sleep-related effects remain underexplored, particularly in Palestinian critical care settings where unique environmental and systemic factors may influence patient outcomes. This study aims to evaluate the effect of NIV on the anxiety level and sleep quality of Palestinian patients in adult critical care units.

Methodology: A descriptive, cross-sectional, non-experimental design was conducted on 83 Palestinian adult patients in critical care units in three governmental hospitals in the West Bank. The Hamilton Anxiety Rating Scale (HAM-A) was used to assess anxiety levels, and the Pittsburgh Sleep Quality Index (PSQI) was used to measure sleep quality. Data were analyzed using descriptive and inferential statistics, including Chi-square tests, one-way ANOVA tests, and linear regression analyses to determine associations between key variables.

Results: Findings showed that 74.7% of patients had mild anxiety, 12% had moderate, and 13.2% had severe to very severe anxiety. Frequent hospitalizations were significantly associated with higher anxiety scores ($p < 0.001$). Reinforcing the psychological burden of prolonged critical care stays. Overall, 85.5% of patients reported good sleep quality, indicating that NIV effectively alleviates respiratory distress. Notably, against early expectations, there was no discernible correlation between age and sleep quality ($p=0.68$).

Conclusion: NIV plays a crucial role in improving sleep quality and alleviating severe anxiety in critically ill patients. However, specific patient subgroups, particularly those with frequent hospitalizations, remain at high risk for increased anxiety. Integrating personalized NIV strategies with psychological support is essential to optimizing patient care in critical care settings. Further research should explore long-term psychological effects and the impact of tailored interventions.

Keywords: Non-invasive ventilation, Anxiety level, Sleep quality, Critical care, Palestinian patients.

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List of Definitions of Abbreviations

Abbreviation	Title
NIV	Non-invasive Ventilation
EI	Endotracheal Intubation
MV	Mechanical Ventilation
IMV	Invasive Mechanical Ventilation
HMV	Home Mechanical Ventilation
BiPAP	Bilevel Positive Airway Pressure
CPAP	Continuous Positive Airway Pressure
IPAP	Inspiratory Positive Airway Pressure
EPAP	Expiratory Positive Airway Pressure
HFNC	High-Flow Nasal Cannula
ASV	Adaptive Servo Ventilation
PaCO2	arterial Carbon Dioxide Pressure
ICU	Intensive care unit
CCU	Complete Cardiac Unit
MICU	Medical Intensive Care Unit
PMC	Palestine Medical Complex
COPD	Chronic obstructive pulmonary disease
ARDS	Acute Respiratory Distress Syndrome
ARF	Acute Respiratory Failure
CHF	Congestive Heart Failure
ALS	Amyotrophic Lateral Sclerosis
LOPD	Late onset Pompe disease
OSA	Obstructive sleep apnea
OSAS	Obstructive Sleep Apnea Syndrome
COVID-19	Coronavirus Disease-19
AI	asynchrony index
RDI	respiratory disturbance index
APP	awake-prone positioning
HRQL	Health-Related Quality of Life
RCT	Randomized Control Tria
REM	Rapid eye movement
PSQI	Pittsburgh Sleep Quality Index
HAM-A	Hamilton anxiety rating scale
RMV	Respiratory muscle weakness
SDB	Sleep-disordered Breathing

Chapter One: Introduction

1.1 Background

Respiratory disorders are a broad category of illnesses that limit breathing and oxygen exchange by affecting the lungs, respiratory muscles, and airways. These conditions rank among the top causes of morbidity and mortality globally and include sleep apnea, pulmonary fibrosis, asthma, and chronic obstructive pulmonary disease (COPD). They may be brought on by infections, autoimmune disorders, environmental exposures including smoking and air pollution, or genetic susceptibility. Shortness of breath, coughing, wheezing, and chest pain are common symptoms of respiratory illnesses that can greatly impair a person's capacity to carry out everyday tasks and reduce their quality of life in general (Chen et al., 2024). The rising incidence of these disorders emphasizes the necessity of non-invasive ventilation and other efficient management techniques to enhance patient outcomes and quality of life.

Respiratory disorders rank as the sixth most common cause of death in Palestine. According to research based in the Gaza Strip, 12% of admissions to the intensive care unit (ICU) were due to lung diseases. However, precise information about the proportion of critical care admissions brought on by asthma and COPD is not easily accessible. The exact effect of these factors on ICU admissions in Palestine requires more investigation (Ministry of Health Health Annual Report Palestine2023 State of Palestine PHIC, 2024).

Grounding this study in the Palestinian context is essential, as critical care units in the region face unique challenges such as limited resources, high patient loads, and disparities in Non-invasive ventilation (NIV) implementation. There is still an absence of research in Palestine on the psychological effects of NIV, specifically with regard to anxiety and sleep quality. In order to better serve critically ill patients, this study fills these gaps by offering locally relevant information that help improve patient management techniques, guide healthcare policy, and simplify NIV practices.

There are two types of Mechanical Ventilation (MV): invasive and non-invasive. In extreme cases, invasive ventilation frequently involves the use of endotracheal or tracheostomy for full respiratory control. In contrast, NIV is a less invasive treatment option that uses a mask to provide support for COPD and sleep apnea for example. NIV enables patients to continue more of their regular activities, whereas invasive ventilation frequently requires sedation (Popowicz & Leonard, 2022).

NIV originated in the mid-1800s when Scottish physician John Dalziel wrote about a body ventilator that employed negative pressure. Non-invasive negative pressure ventilation, or the first American tank respirator in the iron lung, was patented in 1864 by Alfred F. Jones. Barach et al. reported the use of a novel variation of NIV in 1938 to treat pulmonary edema (Gong & Sankari, 2023). The history of this basis of modern respiratory care collection, although NIV was initially applied to patients with acute respiratory failure in the 1940s, has primarily been documented in the last few years. However, both acute and chronic respiratory failure can be treated with NIV, although patient selection and careful monitoring are necessary (Pierson, 2009).

There is currently a strong body of research supporting the use of NIV in many contexts as well as in the exacerbation of chronic cardiogenic pulmonary edema and acute respiratory failure in immunocompromised patients. The necessity for effective respiratory support in conditions like acute respiratory failure, long-term obstructive pulmonary disease, obstructive sleep apnea syndrome, and other respiratory illnesses has led to the rise of NIV. Compared to invasive MV, NIV has various benefits, including reduced problems and increased patient comfort. It is now a crucial ventilatory support device used inside and outside ICU (Gong & Sankari, 2023).

Positive-pressure and negative-pressure ventilation are two techniques that are included in NIV. Providing the airways with oxygen or air under positive pressure is known as positive-pressure ventilation. While Bilevel Positive Airway Pressure (BiPAP) provides two different positive pressure levels during the respiratory cycle, the first is inspiratory positive airway pressure (IPAP), and the second is expiratory positive airway pressure (EPAP), also, Continuous Positive Airway Pressure (CPAP) guarantees a continuous level

of positive airway pressure throughout the respiratory cycle. Without using invasive ventilation, these techniques offer a variety of ventilatory support mechanisms, each with particular applications and factors to consider while managing respiratory failure (Popowicz & Leonard, 2022).

An invasive artificial airway is unnecessary because the ventilator provides positive pressure to the airways through the mask or interface. Since the mask creates a seal between the patient's airway and the ventilator, it is a crucial part of the NIV system. The tubing allows positive pressure to be delivered to the airways by connecting the ventilator and mask or interface. The type of NIV being used, the patient's comfort level, and their condition all have a role in the mask or interface selection (Delorme et al., 2023). When using NIV, common reasons for mask discomfort include increasing air volume in the mask cushions and masks that fit poorly, which eventually create face pressure ulcers.

Furthermore, gaps between the mask and the face can be caused by leakage and poor fit from ill-fitting, inappropriately sized, or inadequately fitted masks, which can affect patient-ventilator synchronization and comfort. Also, skin breakdown and irritation are caused by the tension strap's progressive tightening, which intensifies pressure damage. Skin injury may also be caused by increased inspiratory pressure and air volume in the mask cushions. Moreover, oronasal mask use can cause upper airway blockage, which can cause pain and possibly complicate matters. Proper mask fitting, patient education, trial periods for various types of masks, skincare, and routine reassessment are some of the measures that should be used to control these difficulties and enhance patient comfort and tolerance during NIV (Cammarota et al., 2022).

Recent studies reveal a significant gap in the literature by offering contradictory data about how NIV affects anxiety and sleep quality. According to certain research, NIV enhances sleep architecture, especially in patients with COPD, by lengthening REM sleep duration and decreasing sleep-onset latency (D'Cruz et al., 2023). On the other hand, some research shows that NIV interferes with sleep cycles, causing fragmented sleep as a result of things like pressure-induced awakenings, ventilator asynchrony, mask discomfort, and air leakage (Martí et al., 2022).

Additionally, there is definitely no clear correlation between NIV and anxiety levels. Other research shows that NIV could worsen psychological distress, especially in patients who are experiencing discomfort from devices, claustrophobia, or fear of ventilatory dependence, even though some evidence suggests that it reduces anxiety by alleviating respiratory distress and improving oxygenation (Cammarota et al., 2022). Since anxiety has been found to be a factor in treatment failure and a barrier to NIV adherence, this variability is particularly noticeable in critically ill patients with severe Coronavirus Disease-19 (COVID-19) (Kupeli et al., 2022).

The disparities highlight the complicated connection that exists between sleep physiology, psychological wellness, and NIV. The lack of consensus points to the necessity of context-specific research to determine the ways in which NIV settings, illness severity, and individual patient characteristics affect therapy results. To improve individualized NIV procedures and make sure that psychological and physiological aspects are maximized to improve patient care, further longitudinal and interventional research is necessary.

1.2 Problem Statement

Critical care environments in Palestinian hospitals pose particular difficulties that could affect how well NIV controls patients' anxiety levels and sleep quality. Patient outcomes and NIV availability may be impacted by socioeconomic limitations, such as restricted access to cutting-edge medical equipment. Furthermore, patient compliance and the success of treatment as a whole may be affected by cultural beliefs and resistance toward specific medical procedures. In contrast to other healthcare systems, patients in Palestinian intensive care units frequently face overcrowding, resource constraints, and variations in healthcare services, all of which may affect how effective NIV is. However, there is a lack of comprehensive studies examining these effects within the Palestinian context.

This research aims to investigate the effect of NIV on anxiety levels and sleep quality among Palestinian patients in adult critical care units. By understanding these effects, the study seeks to provide insights that can enhance patient care strategies, improve psychological well-being, and optimize overall outcomes for critically ill patients in this specific healthcare setting

1.3 Objectives of the Study

The study will try to achieve the following objectives:

1. To Evaluate the effect of NIV on anxiety level in Palestinian patients in adult critical care units.
2. To Evaluate the effect of NIV on sleep quality in Palestinian patients in adult critical care units.
3. Identify the most common factors that contribute to anxiety and sleep quality in Palestinian patients in adult critical care units receiving NIV.

1.4 Questions of the Study

1. What is the effect of NIV on anxiety levels measured in Palestinian patients in adult critical care units?
2. What is the effect of NIV on sleep quality levels measured among Palestinian patient in adult critical care units?
3. What are the most common factors that contribute to increased anxiety levels and decreased sleep quality among Palestinian patients receiving NIV?

1.5 Study Hypotheses

1. Patients aged 55 and older experience higher rates of poor sleep quality than younger age groups.
2. Smoking patients experience milder anxiety levels than non-smokers.
3. Patients with a history of more than 3 hospital admissions exhibit severe anxiety levels compared to those with fewer admissions.

1.6 Significance of the Study

When NIV is not used in ICU's, patients frequently have poor sleep quality, which might hinder their ability to recover. Sleep disorders affect as many as 47% of ICU patients, according to research (Sinha et al., 2018). Furthermore, research indicates that 40% of patients on MV have high levels of anxiety, which contribute to non-compliance and therapy failure (Cammarota et al., 2022). This indicates that anxiety is a significant component in NIV failure. Anxiety impairs respiratory effort, heightens discomfort, and breaks off patient-ventilator synchronization, which frequently leads to an abrupt termination of NIV treatment. In light of these difficulties, medical professionals must proactively manage anxiety and sleep issues in NIV patients by putting evidence-based clinical practices into place that improve treatment efficacy overall and patient tolerance and adherence.

Even with NIV's well-established physiological advantages, patient outcomes vary greatly, especially in Palestinian ICU's, where socioeconomic limitations and cultural beliefs may further affect NIV's success. Limited access to advanced medical equipment and apprehension about some therapies may contribute to treatment inequalities and patient unwillingness to use NIV. By focusing on the subjective evaluation of sleep quality and anxiety management in NIV patients rather than just using physiological markers, this study seeks to close this research gap. By offering data-driven insights, the results may help create customized treatment plans, boost patient health, and optimize NIV procedures while influencing medical policies to raise the standard of care in Palestinian ICU's.

1.7 Conceptual Definition

Noninvasive ventilation (NIV): NIV is a respiratory support method that delivers oxygen using positive pressure ventilation without requiring endotracheal intubation (Gao et al., 2022). NIV includes CPAP, which maintains airway patency, and BiPAP, which provides different pressures for inhalation and exhalation, it is commonly used for COPD and neuromuscular disorders. Other types, such as High-Flow Nasal Cannula (HFNC) and Adaptive Servo Ventilation (ASV), are used for respiratory failure and central sleep apnea, respectively. While NIV enhances oxygenation and reduces respiratory distress, it may also

affect anxiety levels and sleep quality due to mask discomfort, ventilator noise, and pressure variations, potentially leading to sleep fragmentation and poor adherence (Cammarota et al., 2022; Sinha et al., 2018). Understanding the interaction between NIV, anxiety, and sleep quality is essential for optimizing treatment strategies, particularly in Palestinian ICUs, where cultural factors and resource limitations may influence patient compliance and outcomes.

Anxiety level: Anxiety is a psychological state of worry, dread, and uneasiness that can be classified according to the HAM-A can be classified as not present, mild, moderate, severe, or very severe. In critical care settings, anxiety is frequently brought on by medical equipment exposure, respiratory problems, and health concerns. Affecting both mental well-being and physiological stability (Kupeli et al., 2022).

Sleep quality: Sleep quality affects one's physical and mental health and is defined as the capacity to fall asleep and remain uninterrupted through the night (Lê Dinh et al., 2022). Using the PSQI, examines several factors such as sleep latency (the time it takes to fall asleep), sleep duration, sleep efficiency, disturbances, and daytime dysfunction during the day. Sleep quality in ICUs is adversely affected by a number of factors, including noisy environments, light exposure, anxiety, frequent medical interventions, and NIV. In addition to improving oxygenation and lowering respiratory effort, which results in enhanced sleep continuity, NIV can potentially promote sleep fragmentation because of discomfort from masks, air leaks, and ventilator asynchrony. Optimizing NIV settings and enhancing patient comfort, adherence, and general health outcomes require an understanding of these aspects.

Critical care unit: is a unit that provides medical care for people who have life-threatening injuries and illnesses (*Critical Care: MedlinePlus,* n.d.).

1.8 Operational Definition

Noninvasive ventilation (NIV): it is a type of ventilation that works by using positive pressure ventilation and involves the delivery of oxygen into the lung via positive pressure without the need for endotracheal intubation (Gao et al., 2022). NIV application is

measured in this study according to patient compliance levels, pressure settings Inspiratory Positive Airway Pressure (IPAP), Expiratory Positive Airway Pressure (EPAP), respiration type (CPAP or BiPAP), and use duration (hours per day). Standardized hospital procedures and international standards are adhered to in order to guarantee accuracy in the implementation of NIV across various intensive care units. These consist of mask fitting techniques, startup settings, patient selection criteria, and monitoring methods to maximize NIV efficacy and minimize patient outcome variability (*A Comprehensive Guide to Noninvasive Ventilation (NIV) | Hamilton Medical,* n.d.).

Anxiety level: In the context of NIV, anxiety can arise due to uncomfortable masks, noisy ventilators, and anxiety about becoming dependent on NIV can all lead to poor adherence and treatment failure (Kupeli et al., 2022). The study's goals are met by the HAM-A scale, which evaluates both psychological (anxiety, worry) and physical (respiratory distress, muscle tension, and others) symptoms. NIV intolerance may be indicated by higher HAM-A scores, highlighting the necessity of focused therapy (Thompson, 2015).

Table 1.8: Scoring of HAM-A tool.

HAM-A Anxiety Level	Potential causes in ICU and NIV Patients
Not Present	Patient is calm, no distress
Mild	Discomfort with ICU environment, slight concern about NIV
Moderate	Difficulty adapting to NIV mask, awareness of breathing struggle
Severe	Fear of ventilator dependence, distress from ventilator noise
Very Severe	Panic, feeling of suffocation, inability to tolerance NIV

Sleep quality: According to the PSQI, sleep quality is the general level of quality and consistency of sleep that patients undergoing NIV experience (Lê Dinh et al., 2022). The PSQI examines several factors such as sleep latency (the time it takes to fall asleep), sleep duration, sleep efficiency, disturbances, and daytime dysfunction during the day. According to this study, a global PSQI score of 5 or lower indicates good sleep quality, while a score of more than 5 indicates poor sleep quality. Furthermore, the PSQI used has been culturally modified for Arabic-speaking communities, guaranteeing its applicability and precision in the Palestinian setting (Suleiman et al., 2010).

Critical care unit: all different types of critical care units in three different geographical areas in Palestine including (adult intensive care units, cardiac care units, surgical intensive care units, and neurosurgery intensive care units). The patients mainly included were cases of asthma, COPD, pneumonia, acute respiratory failure (ARF), post-cardiac surgery, and post-neurosurgery. Because the particular difficulties and results in each kind of unit may vary, this variance in patient cases may affect how broadly the study's conclusions can be applied (*Critical Care: MedlinePlus*, n.d.).

Chapter Two: Literature Review

2.1 Introduction

This chapter includes a review of the most related articles regarding the study's topic about the effect of NIV on anxiety level and sleep quality for Palestinian patients in adult critical care units. the keywords used include noninvasive ventilation, anxiety level, sleep quality, critical care units, and patient's discomfort. All articles included are full-text, originally published in English using multiple search engines like Google Scholar, PubMed, and other respiratory journals, not further than 6 years ago, with 33 articles related to the topic. Non-invasive ventilation, Anxiety level, Sleep quality, Critical care, and Palestinian patients were used as keywords. In general, there is a lack in the coverage of this specific topic, as most of the articles are focused on the physiological effect of NIV from an objective point of view, not a subjective point of view.

This research encompassed diverse facts, from physiological considerations to clinical applications. Language filters were applied to include only English-language studies, ensuring accessibility and clarity. While no specific date restrictions were imposed, preference was given to recent studies to incorporate the latest advancements. Inclusion criteria encompassed studies directly addressing NIV embracing both quantitative and qualitative approaches. Exclusion criteria were defined to filter out studies unrelated to the research focus and those not specific to NIV. Manual searches of reference lists in relevant articles enriched the search strategy, providing a holistic approach to identifying pertinent literature beyond electronic databases.

In critical care units, NIV is a frequently utilized method for providing respiratory support to many patients. Although NIV is an effective treatment, patients' suffering has been brought to light by several studies including the one by Raurell-Torredá et al. (2019), who highlighted the discomfort experienced by patients undergoing NIV. This discomfort may cause patients to have increased anxiety levels and decreased sleep quality, which could in one way or another hinder the treatment's overall efficacy. According to other

studies, prolonged hospitalization durations have been linked to untreated problems during NIV therapy. It is essential to investigate the effects of NIV on patient outcomes, hospital stay duration, and overall well-being to have a thorough understanding of the potential benefits and limitations of this ventilation method. This study seeks to explore the possible advantages or constraints associated with using NIV in enhancing patient well-being, reducing the length of stay, and improving overall healthcare outcomes including anxiety level and sleep quality.

NIV is the application of ventilatory support without the need for a tracheostomy or endotracheal tube. NIV is frequently used for acute respiratory failure, COPD, acute exacerbations of COPD, Acute Respiratory Distress Syndrome (ARDS), and Congestive Heart Failure (CHF), NIV offers the benefit of avoiding challenges associated with invasive techniques like Endotracheal Intubation (EI) and conventional Invasive Mechanical Ventilation (IMV) (Gao et al., 2022). The main objective of NIV is to optimize gas exchange and relieve the work of breathing and the fatigue of respiratory muscles, ultimately leading to improved patient-centered outcomes and comfort, however, one significant benefit associated with using NIV is to lower the incidence of pneumonia (Owens et al., 2023; Raurell-Torredà et al., 2019).

Several types of NIV include CPAP and bilevel BiPAP. CPAP delivers a constant stream of pressure to maintain the airways' openness, particularly in patients diagnosed with obstructive sleep apnea. BiPAP in contrast delivers two pressure levels (higher during inspiration and lower during expiration); it may be helpful for patients with more severe respiratory distress (Shah et al., 2023).

Although NIV is an important tool, it can also be associated with complications, such as nasal dryness, skin breakdown from mask pressure and other mask-related issues, patient-ventilator asynchrony, increased respiratory distress, pneumothorax, gastric distension, aspiration, and discomfort with poor adherence (Martı et al., 2022). In acute settings like the ICU, using NIV can also influence other dimensions of well-being, such as anxiety level and sleep quality (Nayebi et al., 2022; Popowicz & Leonard, 2022).

2.2 Effect of NIV on anxiety level

Patients in the intensive care unit (ICU) experience anxiety due to the severity of their condition, an unfamiliar environment, and the invasive nature of treatments. NIV may affect anxiety, either positively or negatively, based on several factors.

As for anxiety and it is relation to NIV in literature, multiple studies show this relationship between both variables and discussed it specifically. However, a study was conducted in Turkey, studying 62 patients and their rate of anxiety while undergoing NIV due to COVID-19 and results showed that almost two-thirds of patients had anxiety for the first 24 hours of admission. Subsequent analysis of these results indicated that the prevalence of anxiety among COVID-19 patients who were treated with NIV in an ICU was 37.1% and depression a further 43.6%. On the other hand, age and APACHE II scores were negatively correlated with anxiety and depression; this indicates that increasing age as well as increased levels of severity according to the APACHE score reduce the presence of symptoms in terms of both anxiety and depression.

The results of this study suggest that patient characteristics may be associated with their psychological response to NIV (Kup. eli et al., 2022). This finding suggests that additional physiological and psychological elements are involved, even if effiencient respiratory assistance may help reduce anxiety. However, its COVID-19 focus and small sample size might limit its applicability to larger ICU populations.

Moreover, another review conducted in Italy, showed that anxiety is interrelated with NIV, where anxiety is present in the first session of NIV, but from another point of view, anxiety can lead to disturbance of NIV and increase the chance of using sedative agents and possibly IMV, where they termed this situation as NIV failure. To illustrate, the failure rate is high with NIV, mainly because of patient discomfort which distinctly affects whether such therapy succeeds or not. Various techniques have been attempted to improve patient comfort and tolerance during NIV, including interface selection, ventilatory setting optimization, as well as sedation use if needed. IntroductionIn light of the COVID-19 pandemic, awake-prone positioning (APP) was established in various reports for non-intubated patients receiving NIV, with challenges associated with patient comfort during

APP. These results emphasize a complex interplay between anxiety, discomfort, and overall NIV success (Cammarota et al., 2022). This demonstrates how NIV has two sides, as it can reduce respiratory distress while also introducing stresses that heighten anxiety. However, the underlying mechanisms and controls for variations in ICU settings are not completely explored in this review.

A recent study conducted in Malaysia in 2023 highlighted that a significant proportion of patients (approximately two-thirds) experienced distressing and lasting memories of these stressful events. However, Family members had many unmet needs that were also related to critical care services, physical spaces, and monitoring technology. Also, patients and family members requested enhanced temperature control within the ICU, reduced noise levels if in a cubicle, & extra seating for itinerant relatives. In addition, there was a desire from the patients for more call bells to be installed and negative opinions regarding the high rate of alarms caused by medical equipment (Leong et al., 2023). Despite emphasizing family requirements, the study's conclusions might not accurately represent how NIV affects patient's anxiety in a healthcare setting.

Thus, another article supports the idea of giving attention to anxiety for patients' relatives. According to this study, over 70% of the relatives showed signs of psychological discomfort, including anxiety and despair. However, compared to families of male patients, relatives of female ICU patients and postoperative admissions showed considerably higher levels of anxiety. Moreover, relatives who visited the ICU patient more frequently reported feeling less anxious, however, those who learned how gravely ill their family member was reported to feel more anxious (Ige et al., 2022). The complicated emotional dynamics of ICU patient families are highlighted in this study. Indicating complex emotional reactions in family members, but the study's narrow focus on patient type and gender may restrict its wider significance.

Remarkably, NIV still has a significant failure rate (sometimes as high as 40%) today, most often because the patient is uncomfortable or rejects the treatment. In the context of non-invasive ventilation, comfort is defined as a complicated, dynamic state in which patients accept non-invasive respiratory support while experiencing no discomfort or

emotional or physical suffering. Therefore, it is understandable why patients frequently characterize NIV as a very unpleasant experience (Cammarota et al., 2022). Although this study supports the idea that discomfort plays a part in NIV failure. However, the study doesn't go into great details about the precise circumstances that lead to NIV failure.

Nevertheless, a Randomized Control Trial (RCT) took place in Turkey in 2022, where they studied providing information and supportive nursing care in multiple variables for COPD patients undergoing NIV, patients number were 60, divided into 30 patients in the intervention group, and 30 in the control group; the variable of anxiety was included in the list of measured variables, and results showed that the intervention group that had provision of information and goal-directed anxiety nursing care got a statistically significant lower level of anxiety than the control group, enhancing the idea of focusing in supporting anxiety assessment and management for patients on NIV (Cekic et al., 2022). Even if these results emphasize the value of patient education and psychological assistance, the study's limited generalizability to other ICU populations is due to its small sample size and limited focus on COPD patients.

Although the association between NIV and anxiety is currently being examined in the literature, the majority of research does not take sociocultural variations into consideration, which could affect how patients view and react to NIV. The way that patients in Palestine perceive anxiety during NIV may be influenced by a number of factors, including cultural resistance toward technology-based therapies, restricted access to healthcare resources, and differences in patient expectations surrounding ICU care. Furthermore, family participation in decision-making and the emotional strain on family members may also have an impact on NIV adherence and patient comfort. Existing research has not sufficiently examined these aspects, underscoring the necessity of a context-specific examination of anxiety associated with NIV in critical care settings in Palestine.

2.3 Effect of NIV on sleep quality

Critically ill patients, especially those admitted to the ICU, have poor sleep for several reasons because of environmental noise, multiple medical interventions, and the severity of the disease. In those patients, NIV may have an impact on sleep quality. However, successful NIV can decrease the work of breathing and relieve respiratory discomfort, which is promising to improve sleep quality. For example, a study conducted at the respiratory laboratory at the Federal University of Ceara in Brazil by Lino et al found that in patients with moderate to severe COPD, NIV improved significantly sleep parameters by improving sleep architecture, reduced wakefulness, and lowering heart rate during sleep (Lino et al., 2021). Sleep architecture refers to the structure of sleep cycles, such as REM and slow-wave sleep, which are both necessary for both physical and mental recuperation. This study's limited sample size and narrow emphasis on moderate to severe COPD may limit its wider significance, despite the fact that it demonstrated beneficial effects on sleep.

The available research concerning the effect of NIV on sleep architecture is contradictory. Some studies confirm that NIV can significantly improve sleep efficiency and reduce arousal in patients with respiratory failure. For example, a single-center prospective cohort study was conducted in Germany in 2022 on COPD patients and found that NIV therapy doesn't worsen sleep quality in those patients, it might improve sleep quality by improving daytime sleepiness and health-related quality of life (HRQL). Moreover, there was a trend for improvement in slow wave and REM sleep as well as less daytime, this especially held for patients who also had comorbid Obstructive Sleep Apnea Syndrome (OSAS). Thus, the respiratory disturbance index (RDI), significantly decreased, for COPD patients with OSAS in the NIV group. As mentioned before, disease-specific HRQL; significantly improved in the "attended symptoms and sleep" and "respiratory complaints" subscales (Wollsching-Strobel et al., 2022). While these findings suggest possible benefits of NIV on sleep architecture, the results may not be as broadly applicable due to its single-center methodology.

However, the use of NIV can also introduce challenges that may decrease sleep quality. For example, mask discomfort, noise from the NIV, and the sensation of positive airway pressure can also cause frequent awaking's, leading to reduced overall sleep quality.

Marti et al. reported that Patient-ventilator asynchrony occurs frequently during treatment with NIV for acute respiratory failure. However, the extensiveness of air leaks correlates with both ineffective inspirations and delayed cycling as determinants of patient-ventilator asynchrony. Also, severe patient-ventilator asynchrony, defined as asynchrony index (AI) > 10%, is related to the level of pressure support and degree of air leaks (Martı et al., 2022). Although this study focuses on technological difficulties, it offers little information about how these elements relate to sleep disorders as reported by patients. Another study conducted during the COVID-19 shows that to ensure the maximum effectiveness of the NIV, some considerations must be made first, such as pressure settings, mask selection and fit, humidification, and the use of sedation. Otherwise, NIV might cause discomfort and sleep disturbance (Cammarota et al., 2022). This study lists important variables for maximizing NIV, but it doesn't measure how these changes affect the quality of sleep.

Focusing on the general relationship between NIV and sleep quality, a study was conducted to examine the impact of nocturnal MV on sleep while NIV during sleep is commonly used; shows that Nearly half of the patients (49.4%) had poor sleep quality as defined by PSQI score and there was no significant difference in general characteristics, ventilation parameters or alveolar hypoventilation markers between good versus bad sleeper groups. However, full polysomnography monitoring was needed to ensure adequate sleep and ventilation during sleep (Sutter et al., 2023). The PSQI scores alone could miss minor changes in sleep architecture that can only be found with polysomnography.

NIV can also minimize nocturnal hypoxemia and hypercapnia by enhancing ventilation and gas exchange, which enhances sleep quality (Arabi et al., 2022). Moreover, NIV especially home mechanical ventilation (HMV) affects sleep quality in various disorders, such as neuromuscular disorders and obesity hypoventilation syndrome. HMV is an important therapy to improve clinical outcomes and symptoms in patients with COPD, obesity, or neuromuscular diseases; it seems as well a cost-effective treatment for chronic respiratory failure. Clinical studies have established that HMV can either improve or preserve the HRQL in patients with chronic respiratory failure (D'cruz et al., 2023). While these results are promising, care should be used when extending them due to the diversity of patient populations in HMV research.

Furthermore, studies have demonstrated that NIV can reduce the number of awakenings and increase sleep efficiency to relieve sleep-related symptoms, such as excessive daytime sleepiness, and improve sleep architecture. Also, the impact of NIV on sleep quality can differ based on the underlying disease, the particular NIV modality used, and patient-specific characteristics, which is necessary to highlight. As shown by McCartney et al in 2022, sleeping renders major challenges to the control of ventilation, and regulation of arterial carbon dioxide pressure (PaCO2) in patients with COPD who are at risk for chronic hypercapnia, leading to its increased mortality. This study suggests that nocturnal high-level NIV is an effective modality to decrease PaCO2 in stable hypercapnic COPD Patients, but its long-term physiological consequences are unknown. Although this study offers important physiological insights, patient-centered sleep effects are not fully addressed.

However, the available evidence regarding the effects of sleep in ventilator neural drive, mechanical outcomes (in healthy subjects and COPD hypercapnic), both at rest and during eupneic hypopnea, on hypocapnia development due to non-invasive ventilation in nocturnal periods are discussed cautiously with a critical point-of-view expecting new researches ahead (McCartney et al., 2022). The need for additional direct research on sleep quality is highlighted by the fact that this issue is still primarily theoretical.

While focusing on the sleep quality and NIV in neuromuscular disease patients, this topic was discussed in more articles, the first one aimed to investigate the influence of various types of patient-ventilator asynchrony on sleep disruption in chronic patients who receive HMV where patient-ventilator asynchrony was compared in both the home and hospital settings, and results indicated that most types of patient-ventilator asynchrony were associated with arousal, as a result, this led to sleep disruption. However, when patients were transferred to unassisted home environments, the patient-ventilator asynchrony and air leaks dramatically increased; so continuous monitoring and control of NIV at home is recommended to optimize sleep quality for those patients (Delorme et al., 2023b). Although this study emphasized the difficulties with home ventilation, it might not adequately account for the variations in sleep quality between hospital and residential environments.

Two more studies were a review that summarizes the current knowledge on sleep quality in patients who received HMV, including that patients who suffer from chronic respiratory failure frequently experience sleep disturbance; also, HMV observed have the potential to enhance sleep quality in those patients. However, patient-ventilator asynchrony, leakages, and other surrounding environment noises can affect sleep quality in an opposite direction in those patients as mentioned previously (D'cruz et al., 2023, Martı et al., 2022). These evaluations offer a comprehensive summary, but they don't address the variations found in individual studies.

Another study was conducted on Amyotrophic Lateral Sclerosis (ALS) patients, which aims to evaluate the effects of NIV on sleep quality for those patients, this study demonstrates an improvement in nocturnal oxygen saturation, carbon dioxide levels, and sleep architecture in ALS patients following one month of NIV treatment; also, the study examined the effects of NIV on sleep and nocturnal ventilation in patients with late-onset Pompe disease (LOPD) who have sleep-disordered breathing (SDB) or significant respiratory muscle weakness (RMV), and results showed that SDB including both hypoventilation and obstructive sleep apnea (OSA) is prevalent in LOPD (Dorst & Ludolph, 2019). However, NIV has shown immediate improvements in respiration, also in long-term nocturnal normo-ventilation without affecting sleep quality, as Shah et al study shows that the principal cause of death in untreated LOPD is respiratory failure. SDB is one of the earliest symptoms in patients with LOPD and it may predate overt signs of respiratory failure. However, in these circumstances, NIV is the cornerstone therapy for both SDB and respiratory failure to control its associated respiratory complications (Shah et al., 2020). Although NIV improves respiratory metrics, its long-term effects on sleep quality are still unknown, according to the conflicting findings in ALS and LOPD research. Also, underlying how important NIV is for treating SDB and respiratory failure, but they don't go far enough in examining long-term sleep effects.

Moving on from neuromuscular disorders, an article established in Brazil studied the effect of NIV on sleep quality for 10 female patients with stable COPD, resulting in an improvement of sleep quality and process during NIV rather than without the ventilatory support (Lino et al., 2021). This study's generalizability is limited by its small sample size

and single-gender emphasis. Furthermore, another article supported the previous results enhancing the idea that NIV supports and improves sleep quality (Dorst & Ludolph, 2019). However, it supports previous findings, but they don't go into great detail on the underlying processes influencing the quality of sleep. Otherwise, one article was conducted in 2022, with their results indicating no significant difference in sleep quality based on the type of ventilator used for COPD patients. Thus, late NIV failure may indicate early sleep disturbances (Wollsching-Strobel et al., 2022). The null findings suggest more investigation to clarify the connection between sleep disruptions and ventilator type.

2.4 Summary

NIV has a major impact on anxiety levels and sleep quality, and it is essential in the management of respiratory problems in ICU patients. According to research, NIV can improve the quality of sleep by lessening respiratory discomfort and the effort required to breathe. However, mask discomfort, ventilator noise, and intermittent awakenings can also reduce the quality of sleep, as can the same factors that affect sleep architecture, such as ventilator settings, patient-ventilator synchrony, and airflow pressure.
The unfamiliarity of NIV and the feeling of breathing against positive pressure can cause anxiety, which is frequent in ICU's, but it may be lessened with appropriate patient support, education, and customized ventilatory changes. NIV's efficacy and overall therapeutic results may be improved by maximizing patient comfort, alleviating psychological discomfort, and enhancing adherence to the protocol. Despite increasing evidence of NIV's effects, the majority of research has concentrated on its physiological effects, paying little attention to its subjective and psychological consequences, especially in ICU's.

Additionally, context-specific analysis is frequently lacking in current research, particularly in areas like Palestine where cultural considerations, resource constraints, and differences in critical care methods may affect patient experiences and NIV adherence.

In order to fill a significant knowledge gab regarding the subjective patient experience, this study is to assess the effect of NIV on anxiety levels and sleep quality in Palestinian patients in adult critical care units. Additionally, the study aims to provide specific recommendations to improve patient comfort by identifying the most prevalent causes that lead to anxiety and sleep problems in ICU patients using NIV. Future clinical procedures and patient care plans may be influenced by these findings, guaranteeing a more comprehensive approach to NIV management in critical care environments.

Chapter Three: Methodology

3.1 Introduction

The methodology of this study was to approach the effect of NIV on anxiety level and sleep quality for Palestinian patients in adult critical care units.

This chapter includes a summary of the study design, population, and sample characteristics, inclusion and exclusion criteria, data collection and analysis process, and ethical considerations.

3.2 Study Design

The study used a cross-sectional descriptive non-experimental, quantitative research design. The goal was to evaluate the effect of NIV on anxiety levels and sleep quality of Palestinian patients in adult critical care units. This design is suitable for detecting the occurrence and extent of anxiety and sleep disturbances occurring in these patients as well as the relationships amongst variables, without interfering with any conditions.
Since a descriptive, non-experimental cross-sectional design enables the evaluation of spontaneously occurring patient experiences without the need for manipulation or intervention, it was selected. Because NIV is a common ICU treatment, it would be difficult to experiment with a control group both ethically and practically. Moreover, a cross-sectional design allows for the effective collection of data in a short period, which makes it appropriate for researching ICU patients who might have brief hospital stays. Also, it guarantees that the research documents the actual patient experiences, offering insightful information that can guide clinical practice without changing accepted practices.

1.3 Site and Setting

This was a non-probability convenient sample of adult patients who were admitted to critical care units in the West Bank in Palestine. This study is conducted in government hospitals in three geographical areas in the West Bank (Ramallah, Nablus, Hebron). The study was conducted in the critical care units which include ICUs, and Complete Cardiac Unit (CCUs), Palestine Medical Complex in Ramallah, Rafidia Hospital in Nablus, and Princess Alia Governmental Hospital in Hebron.

In order to ensure a thorough evaluation of NIV's effects on anxiety and sleep quality across various healthcare settings, these hospitals were particularly selected because they represent the major geographic regions of the West Bank and offer a variety of critical care services.

Palestine Medical Complex (PMC), originally named the Ramallah Governmental Hospital, is a significantly important healthcare institution in the central region of the West Bank. Renamed the PMC in 2010, with a current capacity of 250 beds, and more than 800 employees, including around 400 nurses (practical, registered, and midwives). PMC encompasses multiple specialized hospitals, including the Bahraini Hospital for Children, the Kuwaiti Hospital for Heart and Specialized Surgeries, the Sheikh Zayed Hospital for Emergency, Orthopedics, and Dermatology, and Ramallah Sons building, also it has a kidney unit. PMC serves as a reference and teaching hospital with various departments such as pediatrics, emergency medicine, internal medicine, general surgery, orthopedics, various critical care units, and gynecology. The hospital has 490 beds, around 1050 administrative and medical staff, and a dedicated nursing team of 400 (Ministry of Health Annual Report, 2021).

Princess Alia Governmental Hospital or Hebron Governmental Hospital is a governmental hospital in Hebron City in the West Bank. It was built in 1957 and has 278 beds, it has around 600 employees including doctors, nurses, and others. This hospital has one main building consisting of several units for general and specialized surgeries, medical, pediatrics, and neonate units. also, it has a CCU, 2 adult medical ICU, and one adult surgical ICU (Ministry of Health Annual Report, 2021).

Al Watani Governmental Hospital is a very important health facility that consists of one building accommodating many medical sections and services. It includes a separate

medical department for each male and female patient, as well as an emergency care ward to care for unstable critical cases. The hospital has a Medical Intensive Care Unit (MICU), and an Adult CCU. It also provides oncology daycare services for cancer patients and runs outpatient clinics in various medical specialties. The hospital units consist of 62 beds with a total employee of 251 workers, among them 114 nurses (practical, registered) (Ministry of Health Annual Report, 2021).

A representative sample of NIV recipients in Palestinian critical care units was ensured by focusing patient inclusion on established eligibility criteria to reduce selection bias. Additionally, to preserve uniformity and minimize variation amongst study sites, data collection was carried out methodically in all hospitals.

3.4 Population, Sample, and Sampling

Population: Adult patients in critical care units in three governmental hospitals in the West Bank, who met the inclusion criteria for this study.

Sample and sampling: a purposive sampling method was used to recruit a sample of adult patients using NIV and admitted to a critical care unit. This method was selected to guarantee that patients who are closely related to the study's goals are included, enabling a targeted examination of NIV's effects on anxiety and sleep quality.

A total of 83 patients were included in this study, using G*Power 3.1.9.7 software, with a power of 0.95, $\alpha = 0.05$, effect size = 0.5, and a matched pair type of test, the recommended sample size is 54 patients. The actual sample size exceeded the recommended size to promote the study's reliability and ensure adequate representation.

Patients were recruited by those who met the inclusion criteria and were willing to participate. Recruitment was carried out methodically, guaranteeing that all eligible patients had an equal chance to take part, so order to reduce any potential selection bias. To ensure consistency in the sample, specific inclusion and exclusion criteria were also used. The selection process was systematic and unbiased to the extent possible.

3.5 Inclusion and Exclusion Criteria

3.5.1 Inclusion Criteria:

- Patients applied to NIV in adult critical care units.

- Patients have the readiness to participate.

- Patients are conscious and oriented.

- Patients are acutely ill (e.g. exacerbation of chronic disease).

3.5.2 Exclusion criteria:

- Patients not conscious or oriented.

- Patients have cognitive impairment or mental illness that may affect their ability to participate.

- Patients have speech impediment (e.g. bulbar syndrome in patients with ALS).

- Patients with a history of pre-existing sleep disorders or anxiety disorders unrelated to their current hospitalization.

3.6 Study Variables

Dependent variables:

- Anxiety level of adult patients in critical care units.

- Sleep quality of adult patients in critical care units.

Independent variables:

- Non-invasive ventilation (NIV).

3.7 Data Collection Tool

Data was collected using two questionnaires:

Hamilton Anxiety Rating Scale (HAM-A): The HAM-A is a thorough instrument with 14 items that is used to determine how severe anxiety symptoms are. On a scale of 0 to 4, with 0 indicating (not present) and 4 indicating (severe) symptoms, each item assesses a distinct facet of anxiety (such as mood, physically symptoms, and cognitive components). Higher scores are associated with more severe symptoms of anxiety; the total score ranges from 0 to 56. The HAM-A has been used extensively in clinical settings because it can accurately evaluate the level of anxiety, which makes it appropriate for both therapeutic and research contexts. The scale is especially useful for identifying small changes in anxiety levels over time, which aids in directing therapy choices.

Pittsburgh Sleep Quality Index (PSQI): The PSQI is a validated questionnaire designed to measure sleep disruptions and quality over a month. Each of its eleven self-rated components evaluates a distinct component of sleep, including duration, latency, difficulties, and general quality of sleep. A global score between 0 and 21 is produced by adding the scores from each component, which range from 0 (no difficulty) to 3 (severe difficulty). Poorer sleep quality is indicated by higher PSQI scores. This measure has been validated in a variety of patient demographics and is useful for determining both subjective and objective elements of sleep disorders. It is especially helpful for getting a comprehensive picture of sleep patterns, taking into consideration variables like the length of time it takes to fall in sleep, how often you wake up at night and how satisfied you are with your sleep in general.

The medical team was trained on how to use both the HAM-A and PSQI, ensuring consistency in data collection and uniformity in scoring across different evaluators.

To ensure the suitability of tools, both questionnaires were given in Arabic language to ensure cultural adaptation. Also, a pilot study was conducted prior to the main study in order to evaluate the data collection tool's viability, clarity, and reliability. For the pilot phase, 30 volunteers in all were gathered. This piloting was conducted to make sure that respondents understood the questionnaire items and to find any necessary changes before the entire study began. Cronbach's alpha was computed to assess the questionnaire's internal consistency. The tool's total Cronbach's alpha was 0.81, which suggests that it is

accepted reliable. A Cronbach's alpha score above 0.70 is regarded as satisfactory for reliability in the body of existing literature, whereas values above 0.80 suggest strong internal consistency (Barbera et al., 2020).

Additionally, the distribution of replies was examined using descriptive statistics on the pilot data. To evaluate the distribution of answers and make sure that the items offered significant participant distinction, the variance of each item was examined. The findings confirmed that the questionnaire items successfully captured the target concepts, with suitable variance levels. Based on the results of the pilot study, the questionnaire was judged appropriate for use in the main study and no significant changes were needed.

3.8 Validity and Reliability

The PSQI is a widely used instrument for evaluating sleep quality among multiple populations. The Arabic version of the PSQI will be used to assess sleep quality in patients under NIV during the study. Suleiman et al. (2010) conducted research that suggested that the present study also showed a high internal consistency of the Arabic version with a Cronbach's alpha score similar to that reported by others at 0.78. The study also confirmed good construct validity and reliability, since PSQI scores were significantly correlated with those of insomnia scales indicating that the Arabic version can differentiate between poor and good sleepers. The study showed that the tool is valid and reliable therefore can be used in Arabic-speaking populations (Suleiman et al., 2010).

The HAM-A scale is a widely used and almost unique, clinical instrument to evaluate the severity of anxiety symptoms. In their study, Hallit et al. (2019), validated the HAM-A across multiple populations and underscored its cross-cultural relevance. The study showed strong psychometric properties of the HAM-A with good internal consistency and reliability (Cronbach's alpha = 0.85). Additionally, it demonstrated fine criterion validity and reliability through high association with other established anxiety scales asserting its usefulness in measuring the level of severity. Thus, this study provided evidence for the

HAM-A's validity and reliability in a variety of clinical settings and would endorse its application to your critical care patient population (Hallit et al., 2019).

3.9 Data Analysis

Data in the results section were analyzed using IBM Statistics 20.0. The following methods were used:

- Descriptive Statistics:

The demographic and clinical features of the patients were compiled using descriptive statistics. For continuous variables, measures of central tendency (mean, median) and distribution (standard deviation, range) were computed, whilst frequencies and percentages were used to characterize categorical variables.

- Univariate analysis:

All variables were examined separately using univariate analysis. This analysis was used to identify trends, distributions, and any variations in the data set.

- Bivariate analysis:

Used to investigate the relationships between two variables.

- One-Way ANOVA Test: In order to determine whether there were statistically significant relationships in the dependent variable among several groups of a categorical independent variable.

- Linear Regression Analysis: It was used for variables that were statistically significant in the bivariate analysis, also it could be used for those were not statistically significant if there is any doubt about existing relationship between two variables. In addition to identifying possible predictors of the outcome variables, this assisted in quantifying the direction and intensity of the relationships.

- Hypothesis Testing:

To test the hypothesis, the Chi-Square Test was used to evaluate relationships between categorical variables. The purpose of using this test is to find out whether there was a significant difference between the observed predicted frequencies under the null hypothesis.

3.10 Ethical Considerations

The study and data collection process are committed to the ethical principles of the Arab American University Review Board, in which approval from the university and the Ministry of Health is granted before starting the data collection process, IRB letter code: R-2024/A/52/N. However, several ethical considerations were used to ensure the protection of patients' rights and well-being, those are listed below:

- Confidentiality: The study patients were kept anonymous. All the data is kept completely anonymous and treated with confidentiality.

- Informed Consent: Patients were provided with informed consent before participating in this study at the beginning of the questionnaires. This includes the study's purpose, the assessment tool used, and rights in this study, ensuring the right to withdraw at any time without the need to declare any reason as the participation is voluntary.

- Data Security: All data were kept with the researcher himself. However, the questionnaires were discarded after obtaining the desired results. Only the researcher has access to this data, no information was shared with others.

3.11 Summary

In this chapter, the methodology offers a systematic and well-organized approach to investigate the effect of non-invasive ventilation on anxiety level and sleep quality for Palestinian patients in adult critical care units. Through the use of comprehensive methods for data analysis and validated instruments, the study seeks to shed light on the psychological effects of NIV in those particular patient populations.

Chapter Four: Results

4.1 Introduction

In this chapter, the results of the collected data are presented in order to address the objectives and the research questions. With an emphasis on both descriptive and inferential statistics, the results are arranged to offer a thorough examination of the data. The chapter starts with a summary of the patients' clinical and sociodemographic traits, then moves on to the findings concerning the primary research variables, such as anxiety and sleep quality. In addition, possible correlations and significant indicators are identified by investigating the relationships among the variables.

To ensure accuracy and clarity, the results are displayed in tables, charts, and narratives. All analyses were carried out using the proper statistical techniques. In light of the study's goals, the results are analyzed, providing context for Chapter five's discussion and implications.

4.2 Socio-demographic data

This section describes socio-demographic features for 83 patients in different ICUs in three governmental hospitals receiving NIV. The data that will be mentioned is crucial to know while interpreting the results of the effect of NIV on anxiety level and sleep quality.

Age:

Age distribution of the patients showed that 31.3% were 55 years or older were the majority of the patients, followed by 25.3% 45-54 years, 18.07% were 25-34 years, 16.87% were 35-44 years, and the smallest group was 8.4% from 18-24 years.

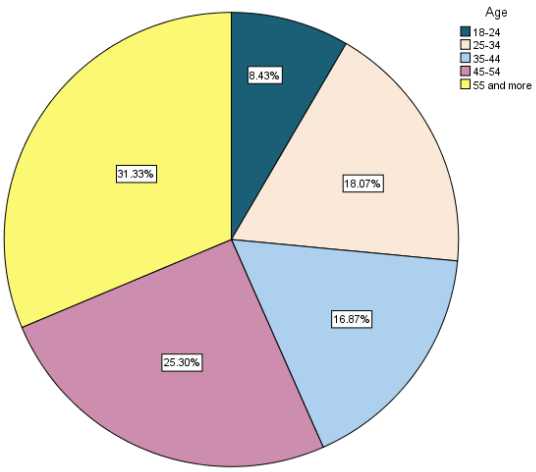

Figure 4.1: Pie chart for age category.

Gender:

A slightly higher proportion of male patients were included in the sample regarding gender, with 45 males (54.2%) and 38 females (45.8%).

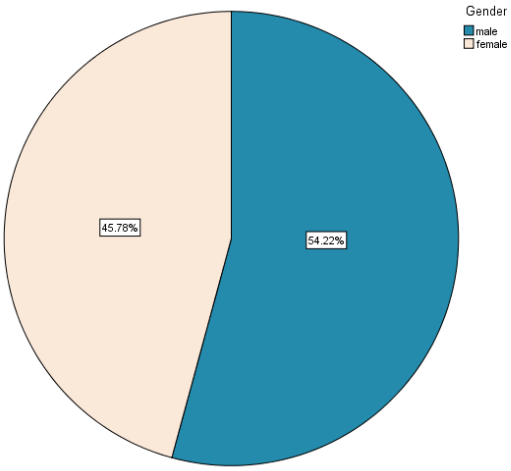

Figure 4.2: Pie chart for gender category.

Education level:

Patients had diverse educational backgrounds in this research. The majority had Bachelor's degrees (38.6%), and fewer had High School education (18.1%). Patients had completed their graduate studies (13.3%), while (12.0%) had a Diploma of the rest, (9.6%) were High school graduates, and (8.4%) had no formal education.

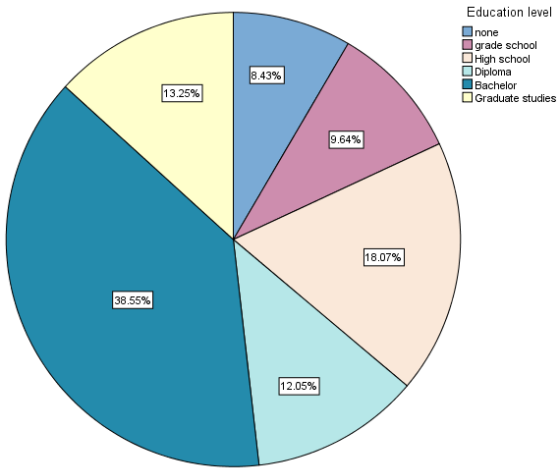

Figure 4.3: Pie chart for education level category.

Place of residence:

The patients were distributed across various places of residence. A significant portion of the patients 42.2% (n=35) living in cities, followed by 34.9% (n=29) living in villages, and 22.9% (n=19) living in camps.

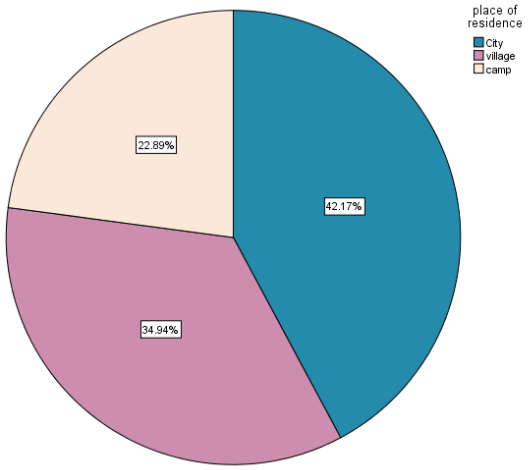

Figure 4.4: Pie chart for Place of residence category.

Marital status:

As for marital status, most were married (44.6%), while widows represented (20.5%) of the sample. However, (7.2%) were divorced, and (27.7%) were single.

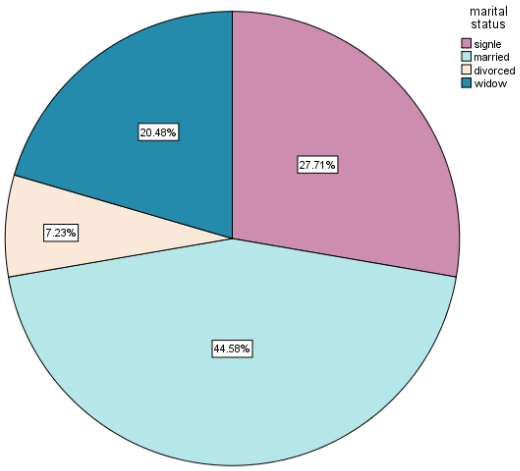

Figure 4.5: Pie chart for the marital status category.

Place of work:

The occupational status of the patients varied widely, with the largest group (32.5%) in the “Others” category encompassing those employed in fields not specifically mentioned. Housewives comprised 16.9%, followed by freelance workers contributed 10.8%. Construction workers comprised 9.6% and healthcare sector workers accounted for 8.4%. The less common were crafts 7.2%, business sector 7.2%, transportation 3.6%, and factories 3.6%.

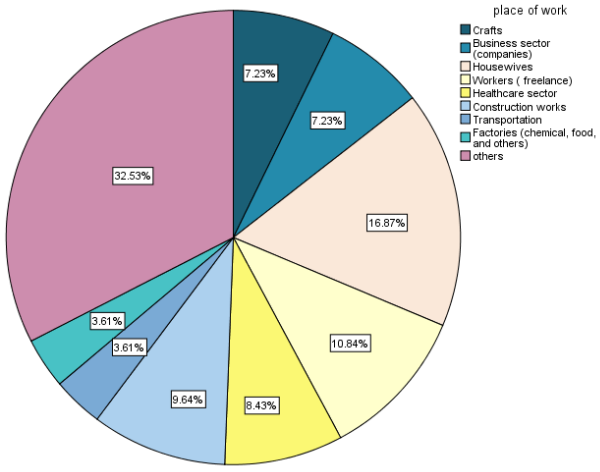

Figure 4.6: Pie chart for place of work category.

Disease Period:

The majority of the patients reported the duration of the disease was ‘almost 5 years’ with a percentage of 69.9%. followed by 6-10 years with a percentage of 19.3%, and for more than 10 years with 10.8%.

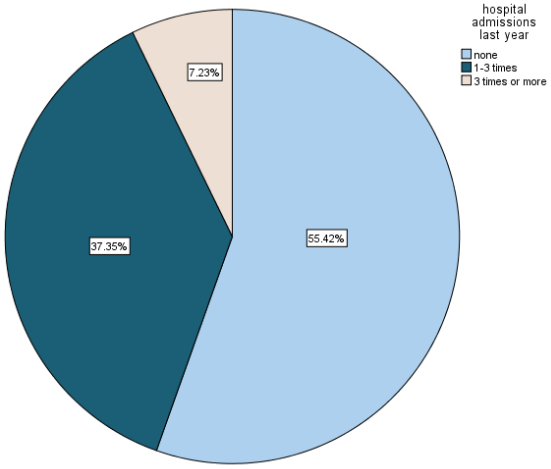

Figure 4.7: Pie chart for the disease period.

Hospital admissions last year:

Most of the patients 55.4% had no hospital admissions in the past year. As 37.3% had 1-3 times of admissions, and the smallest group was 7.2% with 3 times or more hospital admissions.

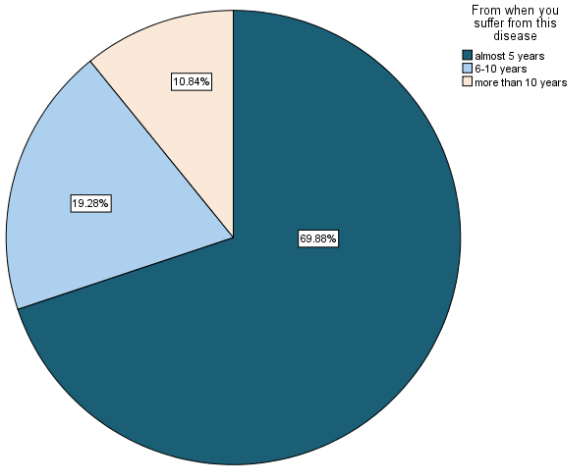

Figure 4.8: Pie chart for the hospital admissions last year.

Smoking status:

Approximately half of the patients were ‘non-smokers’ 48.2% and 47.0% were smokers, and finally 4.8% were ‘was smokers’.

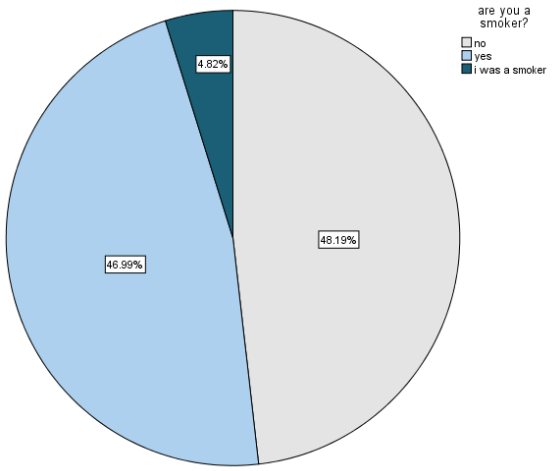

Figure 4.9: Pie chart for the smoking status.

Smoking years:

Patients who were smokers or former smokers (n=44) had a mean smoking period of 17.6 years with a standard deviation (SD) of 11.67.

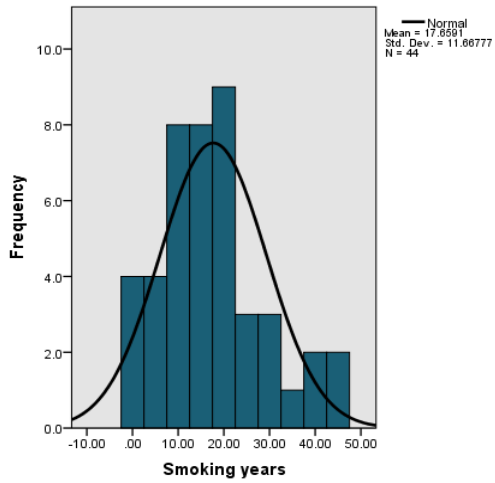

Figure 4.10: Histogram of the smoking years with normal distribution.

Physical activity:

(19.3%) of participants stated they never performed physical activity, while the majority (59.0%) stated they did not. A lower percentage of the participants said they were physically active almost always (2.4%), often (9.6%), or sometimes (9.6%).

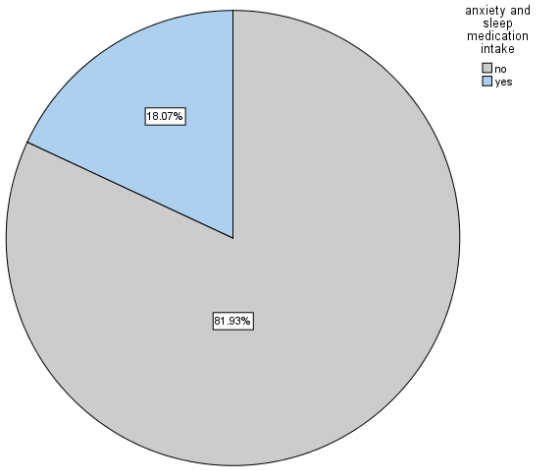

Figure 4.11: Pie chart for the physical activity.

Anxiety and sleep medication intake:

The overwhelming majority (81.9%) reported that they did not take any anxiety or sleep medications, and only (18.1%) were taking medications like Seroquel (quentiapine), Zyprexa (olanzapine) and Clonex (clonazepam).

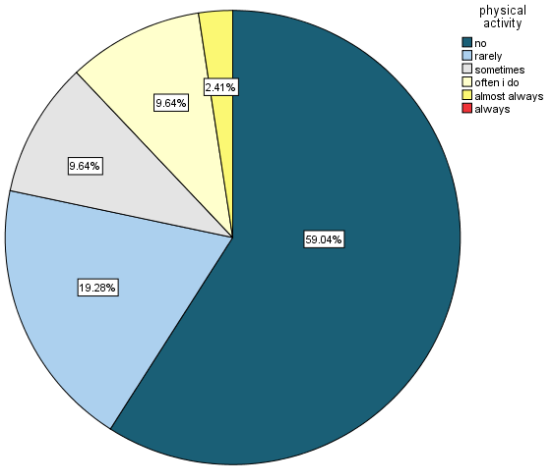

Figure 4.12: Pie chart for anxiety and sleep medication intake.

4.3 Analysis by Research Questions

4.3.1 Effect of NIV on Anxiety level category:

The analysis of anxiety levels among patients who received NIV in adult critical care units reported that the majority (74.7%) had mild anxiety. And (12%) of patients expressed moderate anxiety, compared to (3.6%) who reported severe anxiety and (9.6%) who reported very severe anxiety. The HAM-A category analysis showed a mean anxiety level of 1.48, with a median score of 1.00, suggesting that mild anxiety was more common among patients. This implies that during their therapy, the majority of patients expressed comparatively low levels of anxiety. However, 10% of patients reported HAM-A scores above 3.6, indicating moderate or very severe anxiety levels, indicating variety in anxiety severity as indicated by the standard deviation of 0.95.

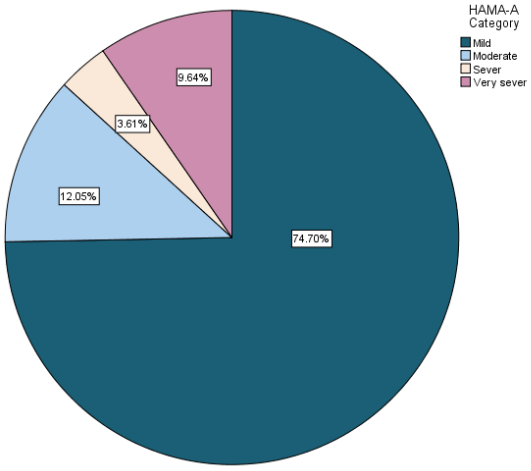

Figure 4.13: Pie chart for HAM-A category.

Table 4.1: HAM-A category central tendency values.

HAM-A Category	
Mean	1.48
Median	1.00
Std. Deviation	0.95
Minimum	1.00

Maximum		4.00
Percentiles	5	1.00
	10	1.00
	90	3.60
	95	4.00

Table 4.2: HAM-A categories frequency and percentage.

	Frequency	Percent
Mild	62	74.7
Moderate	10	12.0
Sever	3	3.6
Very sever	8	9.6
Total	83	100.0

4.3.2 Effect of NIV on Sleep quality category:

Based on the PSQI category, 85.5% of the patients reported having good sleep quality, whereas 14.5% reported having mild sleep quality. With a median of 1.00 and a mean of 1.14, the majority of patients reported only mild sleep quality. The standard deviation of 0.35 reflects a low variability in sleep quality across the sample. Furthermore, no instances of severe sleep disturbance were noted, and all patients reported PSQI values between 1 and 2.

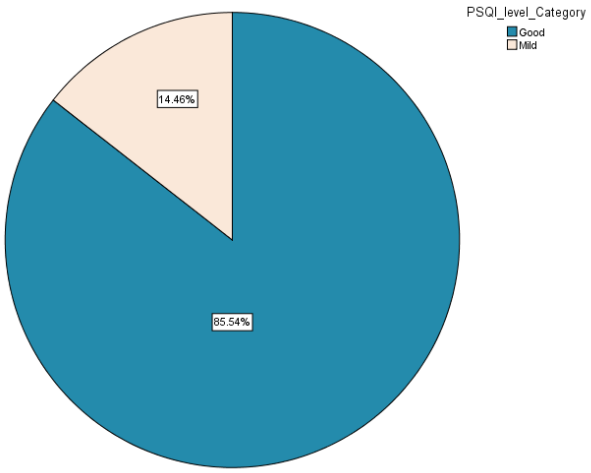

Figure 4.14: Pie chart for PSQI category.

Table 4.3: PSQI category central tendency values.

PSQI Category		
Mean		1.14
Median		1.00
Std. Deviation		0.35
Minimum		1.00
Maximum		2.00
Percentiles	5	1.00
	10	1.00
	90	2.00
	95	2.00

Table 4.4: PSQI category frequency and percentages.

	Frequency	Percent
Good	71	85.5
Mild	12	14.5

4.3.3 Contributing factors to anxiety and sleep quality disturbances:

For interpretation the results of the contributing factors to anxiety and sleep quality both univariate analysis and bivariate analysis was done as follow:

4.3.3.1 Univariate analysis:

1- Physical activity:

Most patients (59.0%) reported no physical activity, followed by those who exercise rarely (19.3%). A lower percentage of respondents reported that they were physically active sometimes (9.6%), often (9.6%), and almost always (2.4%). This distribution shows that most patients in critical care units who receive NIV have inactive lifestyles. A pie chart was created to present these findings as shown previously in Figure (4.11).

2- Hospital admissions:

More than half of the patients (55.4%) reported no hospital admissions in the previous year. While (37.3%) have been admitted 1-3 times in the last year. However, a small fraction (7.2%) had 3 or more hospital admissions in the last year. This distribution suggests that a significant proportion had minimal hospital admissions prior to the current NIV treatment. A pie chart was previously shown to present these findings in Figure (4.8).

3- Smoking status:

Almost half of the patients (47%) were classified as current smokers and nearly the other half (48.2%) reported that they were non-smokers, and the rest of the patients (4.8%) were former smokers. According to these results, smoking is very common among patients using NIV, which could have an impact on anxiety level and sleep quality. The distribution of smoking status was shown in a pie chart previously in Figure (4.9).

4- Anxiety level score (HAM-A total score):

The mean score was 13.60 (SD = 10.81), with the total scores ranging from 0 to 45. The majority of patients had a moderately low level of anxiety, as indicated by the median score of 11.00, which was below what half of them scored. The highest score of 45

indicates severe anxiety, while the lowest score of 0 indicates no symptoms of anxiety. Percentiles were used to further analyze the score distribution. The patients with the lowest scores experienced the least amount of anxiety symptoms, with 5th and 10th percentiles being 1.00 and 3.00, respectively. On the other hand, those with significant anxiety symptoms had scores in the 90th and 95th percentiles, which were 32.40 and 39.40, respectively. A histogram with a normal distribution curve was created to visualize the data. As shown in the histogram the majority of the data were grouped around the mean. The curve shows a slight positive skew indicating that most patients have mild to moderate anxiety with small group were indicating higher anxiety levels.

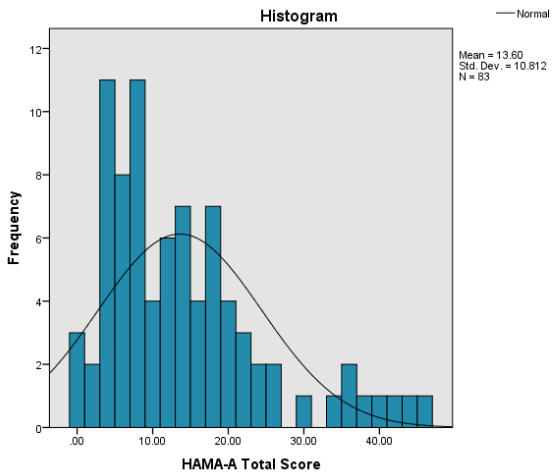

Figure 4.15: Histogram chart for the normal distribution of HAM-A total score.

5- Sleep quality score (PSQI total score):

The PSQI total score had a mean of 4.31 (±0.99), and a median of 4.00. the majority of patients fell within a small or narrow range of sleep quality, with scores ranging from 3.00 to 7.00. Only a small percentage of individuals reported poor sleep quality over this threshold, as seen by the percentile analysis, which showed that 90% of patients scored ≤ 6.00 and 95% scored ≤ 6.00. The frequency distribution of PSQI scores is shown using a histogram with a normal distribution curve. The histogram shows a slight skew towards lower values, indicating that most subjects had better sleep quality.

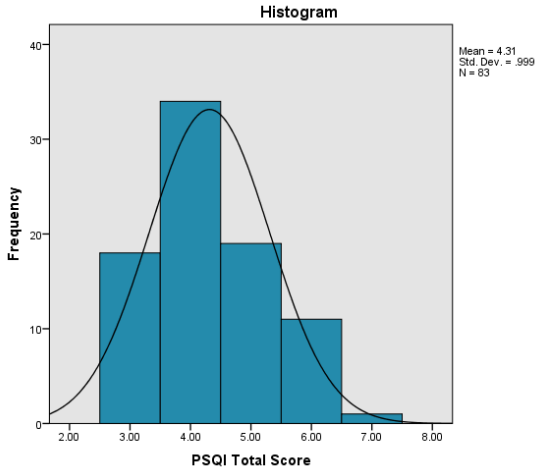

Figure 4.16: Histogram chart for the normal distribution of PSQI total score.

4.3.3.2 Bivariate analysis:

1- HAM-A total score and Physical activity:

To investigate the correlation between anxiety scores and physical activity levels, a one-way ANOVA test was used. The P value of (0.294) indicates no statistically significant relationship between anxiety level and physical activity categories. To show how anxiety scores were distributed throughout different categories, a box plot was made. The overlapping score ranges make it clear that there are no notable variances.

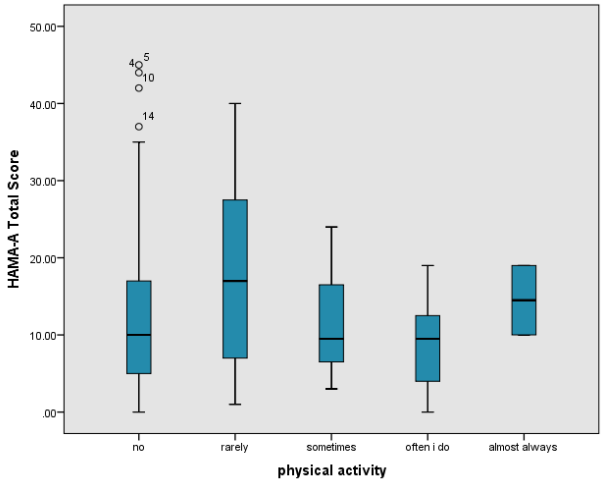

Figure 4.17: Box plots chart shows the relationship between HAM-A total score and physical activity.

2- HAM-A total score and hospital admissions:

HAM-A total score and hospital admissions were significantly correlated, according to a one-way ANOVA test (p =0.000). This revealed that anxiety scores were considerably higher for patients who were admitted to the hospital more frequently. The rising anxiety levels to hospital admissions are shown in the box plot.

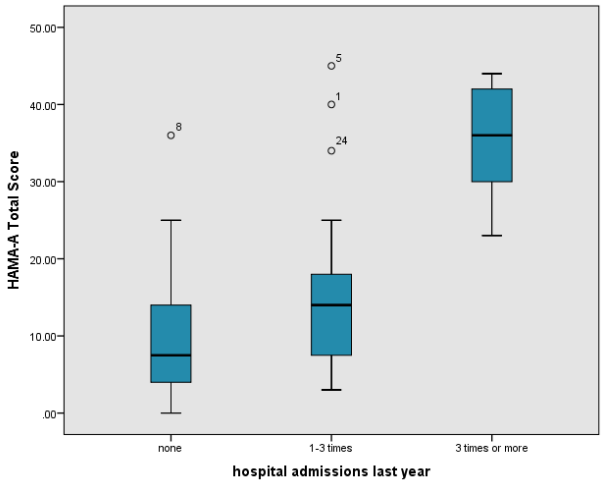

Figure 4.18: Box plots chart shows the relationship between HAM-A total score and hospital admissions.

3- HAM-A total score and smoking status:

A one-way ANOVA test was done to show the relationship between HAMA-total score and smoking status, the results show a (p = 0.002), which indicates a statistically significant relationship. A box plot illustrates the distribution and variability of HAM-A total score with smoking status.

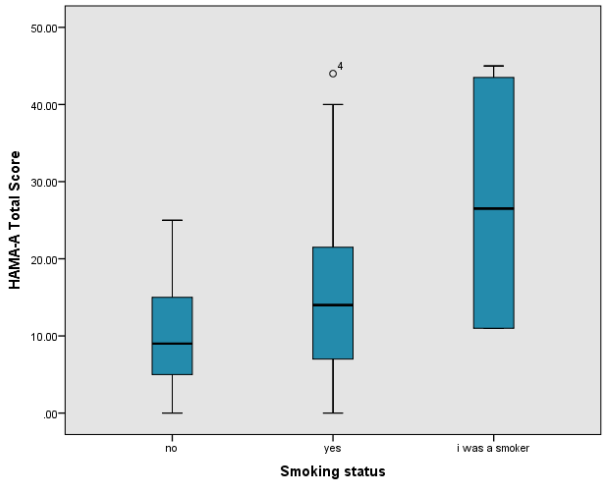

Figure 4.19: Box plots chart shows the relationship between HAM-A total score and smoking status.

4- PSQI total score with physical activity:

The correlation between physical activity levels and PSQI total score was assessed using a one-way ANOVA. The results showed no statistically significant difference in sleep quality across physical activity categories ($p = 0.200$). The distribution of sleep quality scores across physical activity categories was visualized using box plots which revealed little variations.

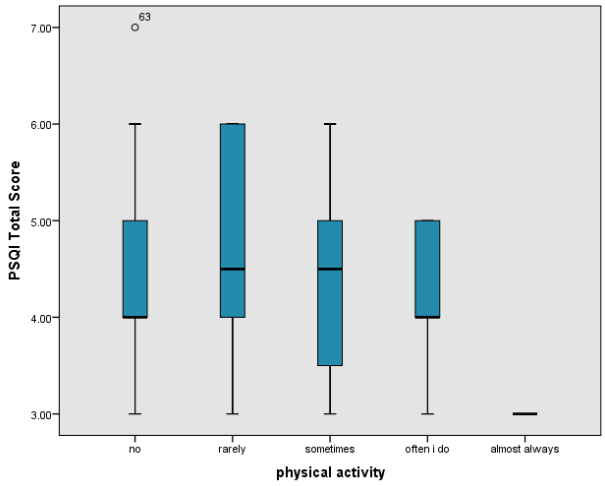

Figure 4.20: Box plots chart shows the relationship between PSQI total score and physical activity.

5- PSQI total score and hospital admissions:

One-way ANOVA was used to examine the correlation between the PSQI total score and the number of hospital admissions in the last year. Results showed no statistically significant difference in the quality of sleep between the hospital admission groups, according to the results (p = 0.907). Box plots was used to show the significant difference between PSQI total score and hospital admissions.

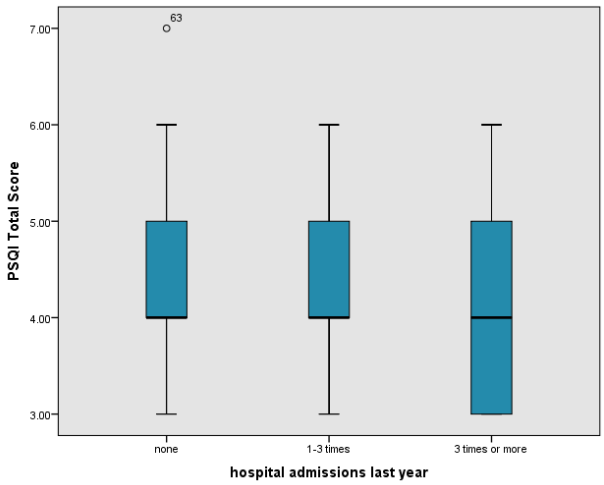

Figure 4.21: Box plots chart shows the relationship between PSQI total score and hospital admissions.

6- PSQI total score and smoking status:

One-way ANOVA was used to investigate the association between smoking status and PSQI total score. There was no statistically significant difference in the quality of sleep between smoking groups, even though the results were close to significance (p=0.085). The distribution of sleep quality scores among smoking groups was shown using box plots, with little variances noted.

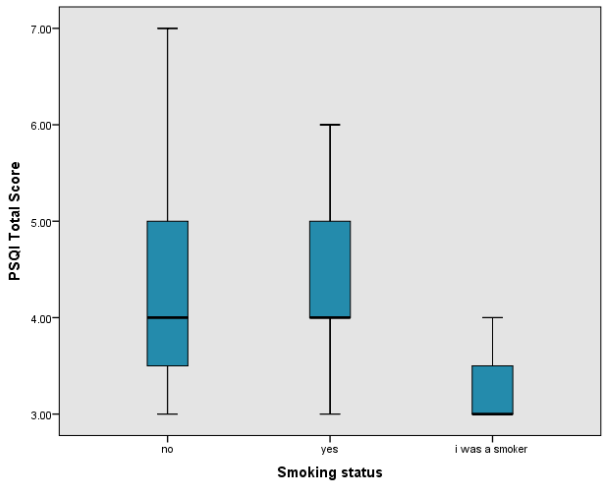

Figure 4.22: Box plots chart shows the relationship between PSQI total score and smoking status.

4.3.3.3 Linear regression analysis:

1- HAM-A total score and contributing factors:

The association between anxiety levels (HAM-A total score) and the factors: physical activity, hospital admissions, and smoking status was investigated using a multiple linear regression analysis. The overall model explained 35.5% of the variance in HAMA-A values (regression coefficient R (R^2) =0.355) and was statistically significant ($p < 0.001$). This suggests that anxiety levels are significantly influenced by these factors taken together.

-Physical Activity:

There was no statistically significant relationship between physical activity and anxiety levels ($p = 0.831$), indicating that variations in physical activity levels had no noticeable effect on HAM-A total scores.

- Hospital Admissions:

There was a substantial and significant correlation between anxiety levels and the number of hospital admissions ($p < 0.001$). This shows that every previous hospital admission was in the last year suggesting that higher anxiety levels were reflected in the

HAM-A total score, which increased by 8.816 points for every additional hospital admission in the last year.

- Smoking Status:

Smokers tended to have higher HAM-A scores, and there was a slight correlation between smoking status and anxiety levels. However, according to ($p = 0.095$), this association was not statistically significant.

These findings imply that physical activity and smoking status do not significantly affect anxiety levels in this population. However, hospital admissions are a key factor influencing anxiety.

2- PSQI total score and contributing factors:

The association between sleep quality (PSQI total score) and the same factors was investigated using a similar multiple linear regression approach. The model only explained 1.3% of the variance in PSQI total scores ($R^{2=}$ 0.013) and was not statistically significant ($p =0.796$), suggesting that these factors had no obvious effect on sleep quality in this sample.

-Physical activity:

The PSQI total scores and physical activity did not significantly correlate ($p = 0.622$), suggesting that changes in physical activity levels were not linked to variations in sleep quality.

- Hospital admissions:

The frequency of hospital visits during the previous 12 months did not appear to have any detectable effect on sleep, as hospital admissions also did not significantly affect PSQI scores ($p = 0.844$).

- Smoking status:

There was not a significant difference in the quality of sleep between smokers and non-smokers, as smoking status was not significantly correlated with PSQI total scores ($p = 0.478$).

These results show that physical activity, hospital admissions and smoking status do not significantly affect sleep quality in this sample.

4.4 Hypothesis testing

Chi-square test was used as a statistical test to examine different hypotheses of the effect of NIV on anxiety level and sleep quality for Palestinian patients in this study.

- Hypothesis 1:

Alternative Hypothesis (Ha): Patients aged 55 and older experience higher rates of poor sleep quality than younger age groups.

Null Hypothesis (Ho): There is no significant association between sleep quality and different age groups.

Table 4.5: PSQI level category and age crosstabulation.

		Age				
		18-24	25-34	35-44	45-54	55 and more
PSQI level category	Good	5	12	13	18	23
	Mild	2	3	1	3	3
Total		7	15	14	21	26

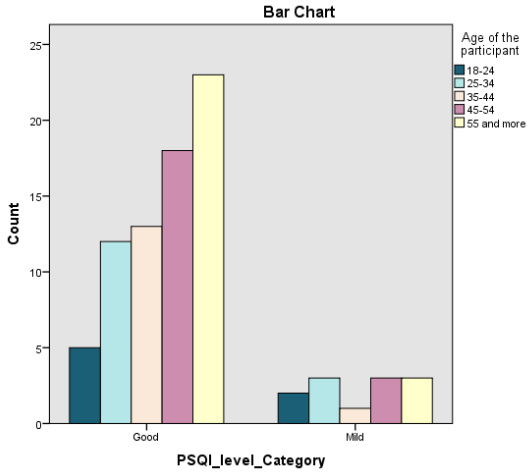

Figure 4.23: Bar chart for PSQI level category and age shows crosstabulation results.

Table 4.6: Chi-Square test between PSQI level category and age.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.285[a]	4	.683
Likelihood Ratio	2.175	4	.704
Linear-by-Linear Association	1.050	1	.305
N of Valid Cases	83		

The results indicates no statistically significant difference (p = 0.68) which is greater than 0.05 in sleep quality among patients of different age groups, accepting the null hypothesis. This implies that age is not the main factor influencing sleep quality problems in patients utilizing NIV. Healthcare professionals shouldn't assume that just because a patient is older, they are more likely to have poor sleep quality. Regardless of the patient's age group, interventions should instead concentrate on other possible causes, such as anxiety, environmental variables, or underlying diseases.

- Hypothesis 2:

Alternative Hypothesis (Ha): Smoking patients experience milder anxiety levels than non-smokers.

Null Hypothesis (Ho): There is no significant relationship between smoking status and anxiety levels (HAM-A level category).

Table 4.7: HAM-A level category and smoking status crosstabulation.

		Smoking status			Total
		no	yes	i was a smoker	
HAMA-A Category	Mild	35	25	2	62
	Moderate	4	6	0	10
	Sever	1	2	0	3
	Very sever	0	6	2	8
Total		40	39	4	83

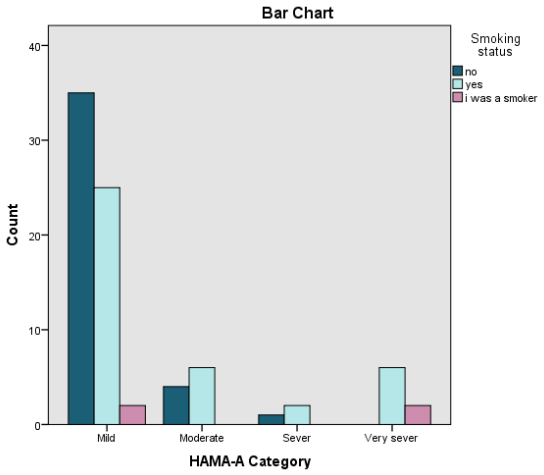

Figure 4.24: Bar chart for HAM-A level category and smoking status shows crosstabulation results.

Table 4.8: Chi-Square test between HAM-A level category and smoking status.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.253[a]	6	.018
Likelihood Ratio	16.118	6	.013
Linear-by-Linear Association	11.637	1	.001
N of Valid Cases	83		

The results show a ($p < 0.05$), which means there is a statistically significant association between the anxiety levels category and smoking status, rejecting the null hypothesis. Compared to non-smokers, smokers and former smokers are more prone to display lower or severe anxiety levels. This suggests that smoking status may have an impact on anxiety.

- Hypothesis 3:

Alternative Hypothesis (Ha): Patients with a history of more than 3 hospital admissions exhibit severe anxiety levels compared to those with fewer admissions.
Null Hypothesis (Ho): There is no significant relationship between hospital admissions and anxiety levels category.

Table 4.9: HAM-A level category and hospital admissions crosstabulation.

		hospital admissions last year			Total
		none	1-3 times	3 times or more	
HAMA-A Category	Mild	39	23	0	62
	Moderate	5	4	1	10
	Sever	1	1	1	3
	Very sever	1	3	4	8
Total		46	31	6	83

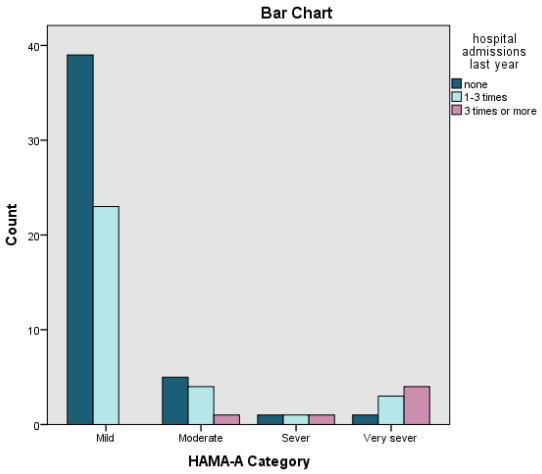

Figure 4.25: Bar chart for HAM-A level category and hospital admissions shows crosstabulation results.

Table 4.10: Chi-Square test between HAM-A level category and hospital admissions.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	31.297[a]	6	.000
Likelihood Ratio	24.062	6	.001
Linear-by-Linear Association	19.765	1	.000
N of Valid Cases	83		

The results show that there was a highly significant association between hospital admissions and anxiety levels category, with (p =0.00), rejecting the null hypothesis. Patients who are admitted to the hospital more frequently especially more than three times, are more likely to suffer from acute anxiety. This emphasizes the psychological toll that frequent hospital stays take.

Chapter Five: Discussion

5.1 Introduction

The research findings are thoroughly analyzed in this chapter, and suggestions are then made in light of the findings. It represents the end of the study when the information acquired and the conclusions derived from it are analyzed to provide useful information for upcoming regulations and field applications. Analyzing the data to find correlations, patterns, and gaps that arose throughout the study is the primary focus of discussion. Also, the significance of the study of the findings from the results was discussed.

Recommendations and suggestions based on the findings of the results are put forward to direct future procedures and regulations in light of these findings. These suggestions are based on the findings of the study and are meant to show how they can be applied successfully, as well as their effect on the field.

5.2 Overview of Findings

5.2.1 Socio-Demographic Data

The effect of NIV anxiety and sleep quality in critically ill Palestinian patients is highlighted in this study. The study emphasized the patients' varied socioeconomic characteristics. The fact that most patients (31.3%) were 55 years of age or older emphasizes that elderly people are the main recipients of NIV, most likely as a result of age-related respiratory disorders. The roughly equal gender distribution (45.8% female, 54.2% male) indicates that the effects on men and women are comparable. Although patients' educational backgrounds varied, the majority (38.6%) had a bachelor's degree, which might have an impact on their coping strategies and health knowledge. The majority of people (42.2%) lived in cities, which may reflect easier access to medical facilities. The

majority of patients (44.6%) were married, according to marital status data, which may offer social support that is helpful in anxiety management.

Remarkably, a significant majority (69.9%) had been coping with their condition for almost five years, although more than half (55.4%) had not been admitted to the hospital in the previous year, indicating stable periods. Nearly half of the group (47.0%) was a smoker, which is significant considering its effects on respiratory health and possible link to anxiety. This could exacerbate health issues because physical activity levels were poor, with (59.0%) of respondents saying they did not exercise at all.

It is unclear whether symptoms were underreported or left untreated because only 18.1% of patients were taking anxiety or sleep aids. These results highlight the significance of customized therapies that target lifestyle and psychological aspects that impact NIV outcomes in addition to medical demands.

Only a tiny percentage of patients reported moderate or severe anxiety, while the majority (74.7%) reported mild anxiety. While smoking had a complex but limited relationship with anxiety intensity, frequent hospitalizations were highly linked to increased anxiety. Age was not significant in any way, and the majority of individuals (85.5%) reported having good sleep with no serious disruptions. Anxiety was primarily caused by stressors associated with hospitals, whereas NIV seemed to improve the quality of sleep. These results highlight how crucial it is to manage stress connected to hospitals in order to promote the psychological wellness of patients undergoing NIV.

Furthermore, the reported anxiety and sleep results might have been impacted by the unique features of Palestinian ICUs, including resource accessibility, cultural views of critical care, and patient-caregiver relations. To completely comprehend these contextual elements' effects on patient well-being, more research is required.

5.2.2 The effect of NIV on Anxiety level

According to the study, the majority of patients (74.7%) had mild anxiety, followed by moderate anxiety (12%) and severe to very severe anxiety (13.2%). These findings imply that even though NIV can reduce severe anxiety, some patients still suffer from severe distress.

The results provide support to the idea that individuals who are admitted to the hospital more frequently have higher anxiety levels. The HAM-A scores reported significantly higher scores for patients who were admitted to the hospital three times or more in the last year, this indicates the cumulative psychological problems increase with multiple hospitalizations.

The results showed a complex connection that rejected the assumption that smokers would have less anxiety. Smokers' anxiety levels ranged from mild to severe, indicating a complex interaction between smoking, anxiety, and the critical care setting. This research emphasizes the necessity of specialized anxiety management techniques, particularly for smokers who can be more vulnerable to stressors in critical care environments.

Furthermore, overcrowding, a lack of privacy, and family attendance rules are some of the other stressors that may be present in Palestinian ICUs and may influence patients' anxiety reactions. Comprehending these environmental elements can aid in creating psychological interventions that are more successful.

5.2.3 The effect of NIV on Sleep quality

According to the results of the PSQI scale, 85.5% of patients reported having good sleep quality. This large proportion suggests that NIV may significantly contribute to improving the architecture of sleep in patients who are in critical condition. In patients suffering from acute or chronic respiratory conditions, NIV can reduce respiratory discomfort, such as nocturnal hypoxemia and hypercapnia, which frequently contribute to disturbed sleep patterns. The physiological parameters required for restorative sleep are probably facilitated by NIV, which increases oxygenation and decreases breathing effort. These findings are in line with earlier studies that show NIV may decrease the frequency of

arousals driven on by respiratory distress while you sleep and help regulate sleep-wake cycles.

The lack of significant sleep disturbances in the study population further demonstrates how well NIV works to address typical problems associated with poor sleep quality in critical care settings. These findings are especially significant because environmental factors including noise, bright lighting, frequent monitoring, and the psychological stress of hospitalization can make sleep disorders worse in the ICU. Sleep quality may also be influenced by Palestinian intensive care unit circumstances, including possible resource constraints, particular patient-care dynamics, and hospital procedures. Examining these variables may help identify other changes that could be made to improve patient rest.

The potential of NIV as a therapeutic intervention to enhance respiratory function and the general quality of life for critically ill patients is highlighted by its capacity to alleviate these effects. The study discovered no significant correlation between age and sleep quality, which was opposite to the original hypothesis. This research casts light on the generally accepted belief that elderly individuals are more vulnerable to poor sleep quality. However, The absence of relationship in this study implies that other factors might be more important.

5.2.4 Contributing factors that affect anxiety level and sleep quality for patients used NIV

- Physical Activity:

Neither anxiety nor the sleep quality found to be significantly correlated with physical activity categories. This implies that the acute nature of hospitalization and the critical care setting may exceed the advantages of physical activity. Furthermore, Palestinian hospitals' restricted mobility and ICU restrictions may make physical activity less feasible, which would lessen its ability to affect anxiety and sleep quality.

- Hospital Admissions:

Higher anxiety levels were found to be strongly positively correlated with the frequency of hospital admissions. This emphasizes the psychological effects that recurrent hospital visits take on patients and the significance of attending to their mental health while they are in the hospital. While poor sleep quality doesn't significantly affected by hospital admissions. The stress of frequent hospital stays may be increased by the nature of ICU's, especially in Palestinian hospitals, underscoring the need for better psychological support in these settings.

- Smoking Status:

There was no significant correlation between smoking and sleep quality, although there was a borderline significant relationship between smoking and anxiety. This emphasizes the necessity of focused interventions for smokers in critical care units, especially to address stress connected to smoking and anxiety management. Future studies should investigate on whether smoking's psychological impacts on ICU patients are influenced by cultural attitudes regarding smoking in Palestinian society.

5.3 Comparing with existing literature

- Anxiety levels:

The results are consistent with those of Kupeli et al. (2022), who found that ICU patients receiving NIV had elevated anxiety levels, especially during the first few sessions of therapy. Similar to this, Cekic et al. (2022) highlighted the significance of information sharing and supportive nursing care in lowering anxiety levels. This demonstrates how focused psychological care, especially in Palestinian hospitals, has the potential to improve outcomes for patients.

On the other hand, although this was not seen in the current investigation, research such as Cammarota et al. (2022) has emphasized how anxiety may interfere with NIV treatment. This variation can be the result of cultural perspectives on medical procedures or

variations in patient management practices. Additionally, compared to previous studies, the unique stresses seen in Palestinian ICUs, such as hospital facilities, nurse-patient interactions, and resource availability, might lead to various anxiety experiences.

- Sleep quality:

The study's findings about the beneficial effects of NIV on sleep quality are consistent with those of Wollsching-Strobel et al. (2022), who found that NIV helped COPD patients sleep more efficiently. Nevertheless, mask discomfort and patient-ventilator asynchrony were problems expressed in research by Marti et al. (2022) and Delorme et al. (2023), which were not particularly noted in this study. Variations in patient groups or ICU protocols could be the cause of this disparity.

Contrary to other research that suggests older individuals are more susceptible to sleep disturbances, there are no discernible age-related changes in the quality of sleep. This result highlights the need for more investigation into age-independent variables influencing the quality of sleep in patients in critical condition. Additional clarification may be obtained by investigating the ways in which Palestinian ICU environments influence variances in sleep quality.

5.4 Implications

5.4.1 Clinical implications:

- Reducing Anxiety Through Targeted Support: Healthcare providers must prioritize reducing anxiety, particularly for patients who have a history of repeated hospital stays. Increased hospital admissions are directly associated with elevated anxiety levels. Counseling, educational sessions, and relaxation techniques are examples of customized psychological care that can assist reduce stress and enhance the hospital stay for patients.

- Enhancing NIV Comfort for Better Results: By making sure that masks fit properly and offering thorough patient education, healthcare professionals should place a high priority on improving the comfort of NIV therapy. This decreases discomfort and encourages better treatment compliance, which improves clinical results.

- Including Families in the Care Process: In order to provide both practical and emotional assistance, it is essential to include family members in the patient's care. Families can lessen patient worry and help them manage the treatment process at home by receiving clear information and training. Involving the family creates an encouraging environment that improves patient well-being and encourages improved treatment compliance.

5.4.2 Theoretical implications:

This research contributes to the understanding of how clinical and sociodemographic variables affect the psychological effects of NIV treatment. This study highlights the complexity of psychological reactions to critical care interventions by examining the interactions between NIV treatment and individual patient variables, including medical history, socioeconomic background, and cultural influences. Future studies examining the impact of regional and cultural differences on NIV outcomes can build on these findings. In critical care settings, this information will be crucial in directing more individualized, customized treatment plans, which will eventually improve patients' psychological and clinical results. Additionally, this study provides opportunities for creating therapies that cater to the unique requirements of various patient groups, guaranteeing more efficient and culturally aware therapeutic modalities.

5.5 Conclusion

According to this study, NIV helps critically ill patients sleep better and experience less severe anxiety. Some subgroups, particularly those who are frequently, are still susceptible to elevated anxiety, though. Even overall age-related parameters had no effect

on sleep quality, more research is necessary to fully understand how NIV affects critically sick individuals.

5.6 Recommendations

1- Patient-Centered Care and Cultural Sensitivity: According to research, patients' anxiety levels and perceptions of NIV might be greatly impacted by cultural influences. When applying NIV in critical care settings in Palestine, culturally sensitive methods must be used. Since patient comfort is greatly affected by the emotional strain on family members, implementing family-centered treatment, as recommended by Ige et al. (2022), can aid in addressing psychological discomfort. Additionally, Palestinian patients' distinct views of technology and healthcare should be taken into account by healthcare professionals, since these may affect how they react to NIV and treatment compliance.

2- Improved Patient Education and Psychological Support: Informational sessions and goal-directed anxiety nursing care can help patients receiving NIV feel less anxious, as shown in the study by Cekic et al. (2022). This highlights the necessity of organized education programs designed to address patients' concerns prior to, during, and following therapy and to educate them about the advantages of NIV. The NIV care plan should include psychological assistance, such as counseling and relaxation techniques, particularly for high-risk groups such patients with COPD or those who need prolonged NIV.

3- Optimizing NIV Settings for Comfort and Efficacy: Mask discomfort and patient-ventilator asynchrony can worsen anxiety and disrupt sleep, thus it's critical to adjust NIV settings to maximize patient comfort and decrease discomfort (Martı et al., 2022). Frequent modifications to humidification, mask type, and pressure settings, as well as the use of sedatives when required, can improve NIV success and lower the risk of therapeutic failure (Cammarota et al., 2022). Adherence may be enhanced by taking patient preferences for mask kinds and settings into account.

4- Enhancing Sleep Quality with Tailored NIV Methods: Although NIV frequently causes sleep disturbances, a number of studies show that this problem can be lessened by adjusting NIV parameters. For instance, research by (Wollsching-Strobel et al. 2022, Lino et al. 2021) indicates that NIV enhances sleep architecture and decreases daytime drowsiness in some patients. Healthcare teams should think about using nighttime mechanical ventilation techniques, like regulating patient-ventilator synchronization and modifying pressure settings, that especially address sleep quality. Furthermore, more sophisticated methods of assessing sleep quality, such as polysomnography, may offer information on how to maximize NIV for improved sleep (Sutter et al., 2023).
5- Addressing Long-Term Effects of NIV on Sleep Quality: Although NIV improves respiratory function and nocturnal hypoxemia, its long-term effects on sleep quality are still unknown. Future research, especially longitudinal studies, is necessary to understand how NIV affects sleep architecture over time, particularly in conditions like neuromuscular disorders or COPD. As proposed by D'cruz et al. (2023) and McCartney et al. (2022), future studies should prioritize investigating the long-term effects of NIV on sleep quality.
6- Family Involvement in Care and Decision-Making: Research such as that conducted by Leong et al. (2023) has demonstrated that family involvement is essential in lowering patients' anxiety levels. Better patient outcomes can result from involving family members in the decision-making process, providing them with emotional support, and describing the procedure. Reducing anxiety and enhancing the overall intensive care unit experience may also be achieved by attending to their unmet needs, such as improved communication about patient situations.
7- Examining the Impact of Socioeconomic and Healthcare System issues: It is critical to examine the ways in which socioeconomic issues can impact patient comfort and NIV adherence, especially in regions like Palestine where access to healthcare resources is limited. Investigations into the availability of resources and healthcare infrastructure in critical care units may provide important new information about how these elements affect NIV success and patient outcomes.
8- Targeted Interventions for Populations at Risk: During NIV therapy, certain groups may have particular difficulties, such as those with neuromuscular illnesses, obesity

hypoventilation syndrome, and COPD. According to studies like those by D'cruz et al. (2023) and Dorst & Ludolph (2019), specialized care procedures catered to certain patient groups could maximize the benefits of NIV and enhance their anxiety levels and sleep quality.

5.7 Research suggestions

1- Investigate the impact of cultural beliefs and regional practices on patients' psychological responses to NIV therapy, particularly in Palestinian settings.
2- Explore the long-term effects of repeated NIV treatments on both psychological and physiological health, with a focus on patients' emotional resilience.
3- Study the effectiveness of customized NIV protocols, such as tailored mask fittings and sedation practices, and how these affects both comfort and clinical outcomes.
4- Examine the influence of ICU environmental factors (e.g., noise levels, lighting) on recovery and overall patient satisfaction.

5.8 Limitations

1- The cross-sectional nature of the study restricts how the results might be interpreted causally.
2- Even while the sample size is sufficient for statistical analysis, it might not adequately represent the variation among various hospitals or geographical areas.
3- Subjective bias may be introduced if self-reported measures are used to assess anxiety and sleep quality.
4- The complexity of the sleep quality study is limited by the lack of physiological sleep monitoring, such as polysomnography.

To verify and improve on the present findings, future research should overcome these limitations.

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Appendices

Appendix A: IRB approval letter

Arab American University
Institutional Review Board - Ramallah

الجامعة العربية الأمريكية
مجلس اخلاقيات البحث العلمي – رام الله

IRB Approval Letter

Study Title: "The Effect of Non-Invasive Ventilation on Anxiety Level and Sleep Quality for Palestinian Hospitalized Patients in Adult Critical Care Units.".

Submitted by: Ameera Yousef Hussein Mara'ba

Date received: 11th January 2024

Date reviewed: 4th February 2024

Date approved: 6th May 2024

Your Study titled **"The Effect of Non-Invasive Ventilation on Anxiety Level and Sleep Quality for Palestinian Hospitalized Patients in Adult Critical Care Units"** with the code number **"R-2024/A/52/N"** was reviewed by the Arab American University Institutional Review Board - Ramallah and it was approved on the 6th of May 2024.

Sajed Ghawadra, PhD
IRB-R Chairman
Arab American University of Palestine

الجامعة العربية الأمريكية - فلسطين
مجلس اخلاقيات البحث العلمي - رام الله
IRB-R
ARAB AMERICAN UNIVERSITY-PALESTINE
INSTITUTIONAL REVIEW BOARD - RAMALLAH

General Conditions:

1. Valid for 6 months from the date of approval.
2. It is important to inform the IRB-R with any modification of the approved study protocol.
3. The Bord appreciates a copy of the research when accomplished.

رام الله – فلسطين
Tel: 02-294-1999 **E-Email:** IRB-R@aaup.edu **Website:** www.aaup.edu

Appendix B: The consent form and Questionnaire

الجامعة العربية الأمريكية
ARAB AMERICAN UNIVERSITY

السلام عليكم

أنا أميرة يوسف مراعبة طالبة ماجستير في برنامج تمريض العناية المكثفة في الجامعة العربية الأمريكية (AAUP) في السنة الأخيرة، وفي الوقت الحالي أعمل على أطروحتي بعنوان تأثير دعم التنفس الخارجي على مستوى القلق و جودة النوم على المرضى الفلسطينين المقيمين في أقسام الحالات الحرجة للبالغين " دراسة وصفية".

تم اختيارك للمشاركة في هذه الدراسة لاستيفائك كامل الشروط المطلوبة للعينة المستهدفة، مشاركتك طوعية تماماً، وستظل جميع المعلومات التي تم جمعها في هذا الاستطلاع سرية تماماً. سيتم استخدام المعلومات التي تم جمعها فقط لأغراض هذه الدراسة. ولديك الحق في رفض الاجابة على أي أسئلة\عناصرأوالانسحاب الكامل في أي وقت خلال فترة هذه الدراسة دون ابداء أي سبب على الاطلاق.

سيستغرق ملء هذا الاستبيان 10-15 دقيقة.

ويتضمن الاستبيان ثلاثة أقسام:

أولاً المعلومات الديموغرافية و الاجتماعية.

ثانيًا، 14 سؤالاً لقياس مستوى القلق.

ثالثًا، 11 سؤالاً لقياس جودة النوم.

مرفق في الأسفل معلومات التواصل للباحث في حال كان لديك أي استفسارات بخصوص هذه الدراسة.

مع كل التقدير والاحترام.

معلومات الاتصال بالباحث:

رقم الهاتف:

+970597581422

البريد الإلكتروني:

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ameera22maraaba@gmail.com

أنا ..... (اسم المشارك / **اختياري**)

أوافق بموجبه على المشاركة في البحث السريري (الدراسة السريرية / دراسة الاستبيان / تجربة الأدوية) المحددة أدناه:

تأثير دعم التنفس الخارجي على مستوى القلق و جودة النوم على المرضى الفلسطينين المقيمين في أقسام الحالات الحرجة للبالغين. لتحقيق درجة: الماجستير، في برنامج: تمريض العناية المكثفة .في الجامعة العربية الامريكية.

تم شرح وتفسير طبيعة الدراسة وهدفها عن طريق الباحث: أميرة يوسف مراعبة.

لقد تم إخباري عن طبيعة البحث من حيث المنهجية والآثار السلبية المحتملة والمضاعفات.

بعد معرفة وفهم جميع المزايا والعيوب المحتملة لهذا البحث، أوافق طواعية بمحض إرادتي على المشاركة في البحث السريري المحدد أعلاه.

أفهم أنه يمكنني الانسحاب من هذا البحث في أي وقت دون إبداء أي سبب على الإطلاق.

التاريخ: ..... إمضاء المشارك: .....

في حضور:-

اسم: .....

التسمية / اللقب: . ..... إمضاء: .....

(شاهد على توقيع المشارك)

أؤكد أنني أوضحت للمشارك طبيعة وهدف البحث المذكور أعلاه.

تاريخ: ..... إمضاء: .....

(الباحث)

أ) المعلومات الديموغرافية و الاجتماعية :

1) العمر:
- 24-18
- 34-25
- 44-35
- 54-45
- 55 وأكثر

2) الجنس:
- ذكر
- أنثى

3) المستوى التعليمي:
- لا يوجد
- المرحلة الابتدائية
- المرحلة الثانوية
- دبلوم
- بكالوربوس
- دراسات عليا

4) مكان السكن:
- مدينة
- قرية
- مخيم

5) الحالة الاجتماعية:
- أعزب
- متزوج
- منفصل
- أرمل

6) مكان العمل:
- الصناعات الحرفية
- قطاع الأعمال (شركات)
- ربات البيوت
- العمال (أعمال حرة)
- الرعابة الصحية
- أعمال البناء
- النقل والمواصلات
- المصانع(الكيميائية،الغذائية، وأخرى)
- أخرى

7) المدة التي كنت تعاني فيها من المرض الحالي:
- تقريباً 5 سنوات

- 6-10 سنة
- أكثر من 10 سنوات

8) خلال السنة السابقة، كم مرة تم ادخالك للمستشفى بسبب هذا المرض:

- لا شيء
- 1-3 مرات
- 3 مرات أو أكثر

9) هل أنت\ي مدخن\ة:

- نعم
- لا
- كنت أدخن سابقاً

*** اذا كانت اجابتك نعم او كنت أدخن سابقاً، فمنذ متى أنت تدخن، اكتب الرقم هنا:----------(/سنة).**

10) النشاط الرياضي:

- لا
- نادراً
- أحياناً
- غالباً ما أفعل
- دائماً تقريباً
- دائماً

11) هل تأخذ أي أدوية للمساعدة على النوم أو لتخفيف القلق، اذكرها..... .

أ) مقياس هاملتون للقلق:

الاسئلة التالية تتعلق بمستوى القلق لديك. يجب ان تشير اجاباتك بدقة الى معظم الايام والليالي في الشهر الماضي. من فضلك اجب على جميع الاسئلة.

	لا يوجد	معتدل	متوسط	شديد	شديد جدا
1-مزاج قلق: هموم، توقّع الأسوأ، شعور سابق للخوف، تهيّج مفرط					
2-التوتر : مشاعر التوتر، تعب، إجفال ، البكاء بسهولة، رجفة ، مشاعر التملّل وعدم القدرة على الاسترخاء					
3-المخاوف: من الظلام، من الغرباء، من الوحدة، من الحيوانات، من إزدحام السير، من الحشود					
4-الأرق :صعوبة الخلود الى النوم، نوم متقطع، فترة نوم غير مرض والشعور بالتعب عند الإستيقاظ، والأحلام والكوابيس الرعب الليلي					
5- الحالة الذهنية: صعوبة في التركيز وضعف الذاكرة					
6- مزاج مكتئب : فقدان الاهتمام، وعدم المتعة في ممارسة الهوايات، والاكتئاب، والاستيقاظ المبكر، و تقلّبات المزاج خلال النهار					

7- حالة جسدية (عضلية): الآلام والأوجاع، والوخز، وصلابة، إنكماش سريع في العضلات، صوت متقلب، زيادة حجم العضلات.					
8-حالة جسدية (حسيّة): طنين، وعدم وضوح الرؤية، هبّات ساخنة وباردة، ومشاعر بالضعف،إحساس بالوخز					
9-عوارض القلب والأوعية الدموية: عدم انتظام في دقات القلب، والخفقان، وألم في الصدر، والخفقان في الأوعية القلبية، شعور بالإغماء، نبض متقطّع وناقص.					
10-عوارض الجهاز التنفسي: ضغط أو انقباض في الصدر شعور بالاختناق ، تنهد، وضيق التنفس.					
11-عوارض الجهاز الهضمي: صعوبة في البلع، وجع وآلام في البطن، وإحساس بالحرق، امتلاء البطن، والغثيان، والتقيؤ، قرقرة الأمعاء ر، رخاوة في الأمعاء (عدم السيطرة على التغوط)، وفقدان الوزن، والإمساك.					
12-عوارض في جهاز التناسلي :كثرة التبويل ، إلحاح التبول، وانقطاع الطمث، وغزارة الطمث، وفقدان الرغبة الجنسية والعجز الجنسي					
13-أعراض الجهاز العصبي الذاتي واللإرادي :جفاف الفم واحمرار الوجه، شحوب الوجه ، الميل للتعرّق ، دوار، صداع ناتج عن الضغط ، وزيادة الشعر.					
14-السلوك خلال المقابلة: تململ بحركات عصبية عدم البقاء بمكانه، وإرتعاش الأيدي، تقطب الجبين ، وجه متوتر أو منقبض، تنهد أو تنفس سريع، وشحوب الوجه، بلع متواصل ، الخ					

ب) مقياس جودة النوم:

التعليمات:

الاسئلة التالية تتعلق بعادات نومك خلال الشهر الماضي فقط. يجب ان تشير اجاباتك بدقة الى معظم الايام والليالي في الشهر الماضي. من فضلك اجب على جميع الاسئلة.

1) خلال الشهر الماضي متى كنت تذهب عادة الى الفراش ليلا؟

ميعاد النوم المعتاد ..... (مثلا: 10:30 مساء)

2) خلال الشهر الماضي كم كان عدد الدقائق التي تستغرقها حتى تخلد للنوم كل ليلة عادة؟

عدد الدقائق ..... (مثلا 10 دقائق)

3) خلال الشهر الماضي متى كنت تنهض من الفراش في الصباح؟

ميعاد النهوض من الفراش ..... (مثلا: 7:30 صباحا)

4) خلال الشهر الماضي كم كان عدد الساعات الفعلية التي تنامها كل ليلة؟ (هذا قد يختلف عن عدد الساعات التي تقضيها في الفراش)

عدد ساعات النوم كل ليلة ..... (مثلا: 10:30 ساعات)

- اختار الاجابة الافضل لكل من الاسئلة التالية من (فضلك اجب على جميع الاسئلة).

5) خلال الشهر الماضي كم مره حدثت لك مشاكل خلال النوم لانك.....

	ليس خلال الشهر الماضي	اقل من مرة واحده قي الاسبوع	مرة او مرتين في الاسبوع	ثلاث مرات او اكثر في الاسبوع
ا) لا تستطيع النوم خلال 30 دقيقة				
ب) الاستيقاظ في منتصف الليل او في الصباح الباكر				
ج) اضطررت للاستيقاظ من اجل الذهاب الى الحمام				
د) لا تسطيع التنفس بارتياح				
ه) السعال او الشخير العالي				
و) الشعور بالبرد الشديد				
ز) الشعوربالحر الشديد				
ح) تساورك احلام سيئة				
ط) الشعور بالالم				
ي) اسباب اخرى رجاء اشرح ..... خلال الشهر الماضي كم مره حدثت لك مشاكل خلال النوم بسبب ذلك				

6) خلال الشهر الماضي، كيف تقيم جودة نومك عموما

جيد جدا --

جيد الى حد ما --

سئ جدا --

سئ الى حد ما --

	ليس خلال الشهر الماضي	اقل من واحده قي الاسبوع	مره او مرتين في الاسبوع	ثلاث مرات او اكثر في الاسبوع
7) خلال الشهر الماضي كم مره اخذت ادوية موصوفة او غير موصوفة لتساعدك على النوم				

8) خلال الشهر الماضي كم مره واجهت مشكلة بالبقاء مستيقظا اثناء القياده او اثناء تناول وجبات الطعام او خلال الانخراط في الانشطة الاجتماعية				

9) خلال الشهر الماضي، كم كان حجم المشكلة لديك للحفاظ على ما يكفي من الحماسة لانجاز الامور

لا مشكلة على الاطلاق ----------
فقط مشكلة بسيطة جدا ----------
مشكلة الى حد ما ----------
مشكلة كبيره جدا ----------

10) هل لديك شريك في الفراش أو تشارك الغرفة

لا يوجد شريك في الفراش أو لا تشارك الغرفة ----------
شريك في غرفة أخرى ----------
شريك في الغرفة وليس الفراش ----------
شريك في الفراش ----------

11) اذا كان لديك شريك في الفراش أو تشارك الغرفة اسأله أو اسألها خلال الشهر الماضي، كم مرة كان لديك:

	ليس خلال الشهر الماضي	**اقل من واحده قي الاسبوع**	**مره او مرتين في الاسبوع**	**ثلاث مرات او اكثر في الاسبوع**
ا) شخير بصوت عالي				
ب) وقفة طويلة بين الانفاس اثناء النوم				
ج) أرجل غير هادئة أثناء النوم وتبقى في حركة مستمرة				
د) نوبات من الارتباك اثناء النوم				
ه) اي عدم راحه اثناء النوم: اشرح من فضلك.....				

النهاية

شكراً لمشاركتكم

Appendix C: Education in Health and Scientific Research Unit Approval

State of Palestine
Ministry of Health
Education in Health and Scientific
Research Unit

دولة فلسطين
وزارة الصحة
وحدة التعليم الصحي
والبحث العلمي

Ref.: .....
Date:.....

الرقم: ع.ت ع/ ٤٠٧٧/ ١٤٤٦
التاريخ: ٢٠٢٤/٨/٧

الأخ مدير عام الادارة العامة للمستشفيات المحترم،،،
عطوفة الوكيل المساعد لمجمع فلسطين الطبي المحترم،،،

تحية واحترام،،،

الموضـــوع: تسهيل مهمة بحث

يرجى تسهيل مهمة الطالبة: **اميرة يوسف مراعبة – ماجستير تمريض العناية المكثفة**– الجامعة العربية الامريكية، بعنوان:

" تأثير دعم التنفس الخارجي على مستوى القلق و جودة النوم على المرضى الفلسطينين المقيمين في أقسام الحالات الحرجة للبالغين."

حيث ستقوم الطالبة بجمع معلومات عن حول موضوع البحث من خلال تعبئة استبانة، وذلك في:

- **مستشفى عالية**
- **مجمع فلسطين الطبي**

مع العلم ان مشرف الدراسة: د. عماد ابو خضر.

على ان يتم الالتزام بالمحافظة على اخلاقيات البحث العلمي وسرية المعلومات، وعدم التعرض للمعلومات التعريفية للمشاركين.

على ان يتم تزويد الوزارة بنسخة PDF من نتائج البحث، التعهد بعدم النشر لحين الحصول على موافقة وزارة الصحة.

مع الاحترام،،،

د. عبد الله القواسمي
رئيس وحدة التعليم الصحي والبحث العلمي

نسخة: عميد كلية الدراسات العليا المحترم/ الجامعة العربية الامريكية

Telfax.:09-2333901 scientificresearch.dep@gmail.com تلفاكس: 09-2333901

State of Palestine
Ministry of Health
Education in Health and Scientific
Research Unit

دولة فلسطين
وزارة الصحة
وحدة التعليم الصحي
والبحث العلمي

Ref.: .....
Date:.....

الرقم: ٢٦٤/ع ص/٢٠٢٤
التاريخ: ٢٠٢٤/٨/٢٩

الأخ مدير عام الادارة العامة للمستشفيات المحترم،،،

تحية واحترام،،

الموضـــوع: تسهيل مهمة بحث

يرجى تسهيل مهمة الطالبة: **اميرة يوسف مراعبة – ماجستير تمريض العناية المكثفة**– الجامعة العربية الامريكية، بعنوان:

" تأثير دعم التنفس الخارجي على مستوى القلق و جودة النوم على المرضى الفلسطينين المقيمين في أقسام الحالات الحرجة للبالغين."

حيث ستقوم الطالبة بجمع معلومات عن حول موضوع البحث من خلال تعبئة استبانة، وذلك في:

- **مستشفى الوطني**

مع العلم ان مشرف الدراسة: د. عماد ابو خضر.

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مع الاحترام،،،

دولة فلسطين
وزارة الصحة
وحدة التعليم الصحي والبحث العلمي

د. عبد الله القواسمي
رئيس وحدة التعليم الصحي والبحث العلمي

نسخة: عميد كلية الدراسات العليا المحترم/ الجامعة العربية الامريكية

Telfax.:09-2333901 scientificresearch.dep@gmail.com تلفاكس: 09-2333901

مستويات القلق وجودة النوم بين المرضى الفلسطينين في أقسام الحالات الحرجة للبالغين: دراسة وصفية حول استخدام دعم التنفس الخارجي

أميرة يوسف حسين مراعبة

لجنة الاشراف: د.عماد أبو خضر

د.ساجد غوادرة

د.عبدالله الواوي

ملخص

المقدمة: تعد الاضطرابات التنفسية سبباً رئيسياً للمرض والوفيات على مستوى العالم، وغالياً ما تتطلب علاجات مثل التهوية غير الغازية (NIV) وعلى الرغم من أن فوائدها التنفسية موثوقة جداً، إلا أن تأثيراتها النفسية وجودة النوم لا تزال غير مستكشفة بشكل كافٍ، لا سيما في وحدات العناية الحرجة الفلسطينية، حيث أن العوامل البيئية والنظامية الفريدة قد تؤثر على نتائج المرضى الصحية. تهدف هذه الدراسة إلى تقييم تأثير التهوية غير الغازية على مستوى القلق وجودة النوم لدى المرضى الفلسطينيين في وحدات العناية الحرجة للبالغين.

المنهجية: تم اجراء دراسة وصفية، مقطعية، غير تجريبية على 83 مريضاً بالغاً في وحدات العناية الحرجة في ثلاثة مستشفيات حكومية في الضفة الغربية. وقد تم استخدام مقياس هاملتون للقلق (HAM-A) لقياس مستويات القلق، ومؤشر بيتسبرغ لجودة النوم (PSQI) لتقييم جودة النوم. تم تحليل البيانات باستخدام الإحصاء الوصفي والاستدلالي، بما في ذلك اختبار كاي–سكوير (Chi-square test)، واختبار تحليل التباين الأحادي (One way ANOVA test)، بالإضافة إلى تحليل الانحدار الخطي (Linear Regression) لتحديد الارتباطات بين المتغيرات الأساسية.

النتائج: أظهرت النتائج أن 74.7% من المرضى يعانون من قلق خفيف، و 12% من قلق معتدل، و 13.2% من قلق شديد إلى شديد جداً. وجدت علاقة ذات دلالة إحصائية بين تكرار الدخول إلى المستشفى وارتفاع مستويات القلق ($p<0.001$)، مما يعكس العبء النفسي الناجم عن فترات المكوث الطويلة في العناية الحرجة. بشكل عام، أفاد 85.5% من المرضى بتمتعهم بجودة نوم جيدة، مما

يشير إلى أن التهوية غير الغازية تساهم بشكل فعال في تخفيف ضيف التنفس. ومن الجدير بالذكر أنه خلافاً للتوقعات الأولية، لم يكن هناك ارتباط واضح بين العمر وجودة النوم (p=0.68).

الخلاصة: تلعب التهوية غير الغازية دورًا أساسيًا في تحسين جودة النوم والتخفيف من حدة القلق الشديد لدى المرضى في العناية الحرجة. ومع ذلك، تظل بعض الفئات الفرعية من المرضى، خاصةً الذين يعانون من تكرار الدخول إلى المستشفى، عرضةً بشكل أكبر لزيادة مستويات القلق. لذا، فإن دمج استراتيجيات تهوية غير غازية مخصصة مع دعم نفسي يعد أمرًا ضروريًا لتحسين رعاية المرضى في بيئات العناية الحرجة. ينبغي إجراء المزيد من الأبحاث لاستكشاف التأثيرات النفسية طويلة الأمد ومدى فاعلية التدخلات المصممة خصيصًا لهذه الفئة من المرضى.

الكلمات المفتاحية: التهوية غير الغازية، مستوى القلق، جودة النوم، العناية الحرجة، المرضى الفلسطينيون.