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The prevalence of stress and stressors among pediatric oncology nurses working in pediatric oncology units in Pakistan - An analytical cross-sectional study

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By

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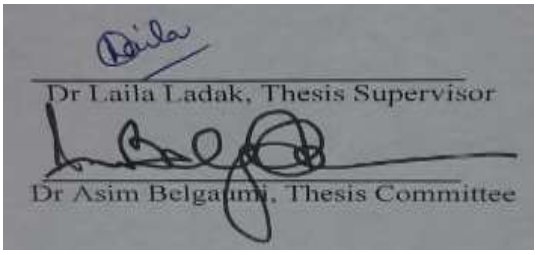

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Dedication

I would like to dedicate this dissertation to the people who have been my unwavering pillars of support throughout this journey:

To my loving family, who have believed in me from the very beginning and encouraged me to pursue my dreams. Your endless love, patience, and sacrifices have been the driving force behind my success.

To my dedicated professors and mentors especially Dr Shamvil Ashraf, Dr Julia Challinor and Ms Rehana Punjwani, whose guidance and wisdom have shaped my intellectual growth and inspired me to strive for excellence.

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Abstract

Introduction:

Pediatric oncology nurses in Pakistan are at the forefront of caring for young cancer patients. In Pakistan, thousands of children are diagnosed with cancer every year, however the country's healthcare system lacks a comprehensive National cancer registry. Pediatric oncology nurses face high stress levels due to the demanding nature of their work, lack of specialized training, and communication challenges with patients and families. This study aims to explore the prevalence of stress and its predictors among these nurses in Pakistan, addressing a significant research gap.

Purpose:

The purpose for the study was to measure stress and identify its predictors among pediatric oncology nurses in Pakistan.

Methodology

This study utilized an analytical cross-sectional design to examine stress levels and stressors among pediatric oncology nurses in various hospitals across Pakistan. The study was conducted in pediatric oncology units of hospitals registered with the Pakistan Society of Pediatric Oncology (PSPO). The study population included approximately 150 nurses from 15 different hospitals, with a total population sampling strategy employed. Data collection occurred between July and September 2023, with the data analyzed using SPSS 21.0 using descriptive and inferential statistics. Ethical considerations, including consent and data privacy, were carefully managed to ensure participant well-being.

Findings

This study enrolled 108 pediatric oncology nurses from various hospitals in Pakistan, most were female (64.8%) with a mean age 30.78 ± 5.4, and 57% were married. The Perceived Stress Scale (PSS) showed moderate stress levels mean score of 21.12 ± 4.6, with 8.3% having low stress, 78.7% moderate stress, and 13% severe stress. Stressor assessment using the Stress Scale for Pediatric Oncology Nurses (SSPON) revealed the highest stress related to "knowing what is ahead" (mean 73.49), "limitation of care" (mean 73.36), and "system demands" (mean 71.43). "Co-worker" stressors scored lowest (mean 70.53). Gender had significant statistical association with stress levels (p=0.01) and stressors (p=0.05), while other socio-demographic factors showed no significant statistical association.

Conclusion

In conclusion, this study underscores the prevalence of moderate to high stress levels among pediatric oncology nurses in Pakistan. It specifically underscores the stressor common among pediatric oncology nurses of Pakistan that were stressor related to knowing what is ahead and limitation to care. To alleviate stress among pediatric oncology nurses in Pakistan, organizational measures include implementing support programs, stress management training, and regular health assessments. Personal strategies involve sensitizing nurses to mental health, encouraging support-seeking, and educating them on effective coping mechanisms. These recommendations aim to create a supportive environment and enhance the well-being of nurses by addressing both organizational and personal aspects of stress management.

List of Abbreviation

ANOVA	Analysis of Variance
CINHAL	Cumulative Index to Nursing and Allied Health Literature
CMO	Chief Medical Officer
CNI	Clinical Nurse Instructor
CNO	Chief Nurse Officer
ERC	Ethical Review Committee
HIC	High Income Country
LMIC	Lower Middle-Income Country
NCI	National Cancer Institute
NSM	Neuman's System Model
PSPO	Pakistan Society for Pediatric Oncology
PSS	Perceived Stress Scale
SDG	Sustainable Development Goals
SPSS	Statistical Package for Social Science
SSPON	Stressor Scale of Pediatric Oncology Nurses

SWB Spiritual well being

WHO World Health Organization

WOQOL-BREF World Health Organization QOL Scale

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Declaration

I declare that this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any university and to the best of my knowledge it does not contain any material previously published or written by another person, except where due reference has been made in the text.

The editorial assistance provided to me has in no way added to the substance of my thesis which is the product of my own research endeavours.

(Shenila Anwarali)

14th November 2023

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Chapter One Introduction

This chapter includes the detailed background of the title. Additionally, this chapter describes the research question and the purpose of the study. It also highlights the significance of the study, particularly in developing countries.

Background

On a routine basis, pediatric oncology nurses in Pakistan are on the frontline of care, supporting young patients and their families in their battle against cancer. However, behind their unwavering dedication lies a hidden challenge - the prevalence of stress. According to World Health Organization (WHO), each year, around 400,000 children develop cancer globally, out of which the most common types of cancer are leukaemia, brain cancers, lymphoma and solid tumours such as Neuroblastoma and Wilms tumours (World Health Organization, 2021). Of this, 90 per cent of the children are from low-and-middle income countries (Gupta et al., 2015). According to the Pakistan Pediatric Association (2022), approximately 10,000 to 12,000 children in Pakistan are diagnosed with cancer yearly. A source states that about 8000- 8500 new cases are identified in Pakistan; this figure could be higher due to underreporting undiagnosed cases. Most common pediatric cancers are leukaemia and lymphomas, as per the Karachi Cancer Registry, while the Punjab Cancer Registry shows lymphomas are more common than leukaemia in children (Afzal, 2020). However, Pakistan’s health care system still does not have an comprehensive national cancer registry that can identify the basic epidemiological figures. Hence all the data was gathered from various hospital registries (Ashraf, 2012). The cure rate of most

pediatric cancers is 80% in high-income countries (HIC) due to well-established healthcare infrastructure with governance, regulation and active participation in clinical trials where healthcare facilities are available and accessible as compared to low-and-middle-income countries (LMICs) where cure rate is less than 30% (Lam et al., 2019). According to another article, caring for children can be a challenging and rewarding experience yet very stressful (Inal, Kelleci, Yantiri, & Erdim, 2020).

According to World Health Organization (2021), cancer is one of the leading causes of death among children and adolescents. Regardless of the current success in treatment modalities in the United States, approximately 1,800 children and adolescents still die due to cancer annually (Nation Cancer Institute, 2021). Worldwide 70% of all cancer-related deaths occur in LMICs (Bajwa M.H., 2017). World Health Organization's Global Health Observatory reports that in 2020, there were an estimated 8,300 new cases of childhood cancer and 6,200 deaths due to childhood cancer in Pakistan.

Pediatric oncology is a highly stressful work environment characterized by the complexity of care, the physical and emotional suffering of patients and families, and the challenges associated with treatment-related decision-making and end-of-life care (Schultz, 2017). The constant exposure to traumatic experiences can lead to compassion fatigue, resulting in burnout, inadequate care delivery, and job dissatisfaction among healthcare providers (Molinaro, 2021). Nurses providing care to pediatric oncology patients are particularly vulnerable to the detrimental effects of stress due to their prolonged and intensive interactions with patients and their families (M. Zarenti et al., 2021). The burden of caring for patients of the same age or gender as their loved ones or with similar personal experiences can further contribute to the development of compassion fatigue (Schultz, 2017). Communication with

patients and families has also been reported as challenging to harness in pediatric oncology care (M. Zarenti et al., 2021). Such stressors have been shown to contribute to nursing job turnover within this speciality, further underscoring the need to investigate the prevalence of stress and its predictors among pediatric oncology nurses in Pakistan, where research in this area is limited. Therefore, this analytical cross-sectional study aims to fill this knowledge gap by exploring the prevalence of stress and its predictors among pediatric oncology nurses in Pakistan to identify effective interventions to enhance their well-being and improve patient outcomes.

Although the need for specialized nurses in pediatric oncology is evident, the majority of nurses working in pediatric oncology units across Pakistan have not received any formal education in pediatric oncology, leaving them novices with limited working knowledge and experience (Ko, 2016; Ko & Kiser-Larson, 2016). This lack of specialized training puts them at high risk for emotional and physical stress, anxiety, and job dissatisfaction, which can further contribute to nurses leaving jobs in this challenging field (Ko & Kiser-Larson, 2016). Furthermore, oncology nurses are exposed to potentially stressful situations, such as dealing with multiple mortalities, leading to a sense of powerlessness and hopelessness in life (Hinds et al., 2003). As a result, pediatric oncology nurses present with high stress related to the nature of their work, extreme workload and emotional distress related to losing their patients (Lioka et al., 2022) . Another comparison study performed among pediatric and pediatric oncology nurses in Greece stated that pediatric oncology nurses have more stress than pediatric nurses. In addition, the extreme workload in pediatric oncology units, with extended hours, high patient acuity, and complex care needs, can contribute to increased stress levels among nurses (Lioka et al., 2022).

Furthermore, the work environment in pediatric oncology units plays a crucial role in influencing the work efficiency of nurses (Hinds et al., 2003). Thus, identifying various factors

related to the work environment that contribute to role-related stress and enhancing the sense of role-related meaning can play a crucial role in developing interventions towards reducing stressors and improving the level of care provided by pediatric oncology nurses (Hinds et al., 2003). This underscores the importance of investigating the prevalence of stress and its predictors among pediatric oncology nurses in Pakistan, where specialized education and support for these healthcare professionals may be lacking, and the need for effective interventions to mitigate the impact of stress on their well-being and job satisfaction needs to be addressed.

A systemic review highlighting stress among pediatric oncology staff reported various factors such as lack of quality equipment, lack of consideration by physicians, particularly in the inclusion of care planning and decision making, unit management and parents' attitude are considered as work-related stresses (Ko & Kiser-Larson, 2016; M. Zarenti et al., 2021). In addition, in a study by Chang et al., nurses noted that 'making mistakes' had the highest mean score on the stressor scale for pediatric oncology nurses (SSPON) (2007). Furthermore, oncology nurses often ignore their own emotional experiences while caring for patients and their families, which can lead to ineffective coping behaviours, feelings of failure, constant work pressure, and even depression (Ko & Kiser-Larson, 2016).

In light of these challenges, healthcare organizations need to recognize the unique stressors pediatric oncology nurses face and take steps to mitigate them. This may include providing adequate staffing levels and specialized training, ensuring access to quality equipment and resources, offering supportive services such as counselling and debriefing sessions, and promoting self-care and resilience among nurses through education and training programs (M. Zarenti et al., 2021). By addressing these stressors and providing support, healthcare

organizations can help reduce the risk of burnout, emotional distress, and turnover among pediatric oncology nurses, ultimately enhancing the quality of care for children with cancer.

Despite extensive research on the level of stress and stressors among pediatric oncology nurses, there is a lack of significant data on assessing stress and stressors in the context of pediatric oncology nursing in Pakistan. Therefore, it is imperative to identify and address these stressors in order to provide high-quality care to patients and their families.

In recent years, there has been growing recognition of the need for hospital administration staff to assess the prevalence of stressors and implement strategies to help pediatric oncology nurses cope with their unique stressors. This includes creating a safe and fostering work environment that supports the well-being of nurses and ultimately enhances the quality of care for patients and their families (Mukherjee et al., 2014). By identifying and addressing the stressors faced by pediatric oncology nurses, healthcare organizations can support their resilience and well-being, leading to improved patient outcomes and overall satisfaction among patients, families, and society in need.

The Rationale of the Study

Pakistan has a high burden of pediatric oncology cases, with over 8000 new cases annually; this figure may be an underestimation, and two-thirds of patients present at advanced stages of the disease (Farooq et al., 2022) . Given the limited resources in the country, providing adequate care for such patients can be a significant challenge. A specialized pediatric oncology workforce is required to deliver high-quality care in this setting (Challinor, 2022). However, Pakistan has a shortage of trained healthcare professionals in this field which can result in inadequate care provision and ultimately lead to burnout and attrition from the profession.

In this analytical cross-sectional study, we explore the prevalence of stress among pediatric oncology nurses in Pakistan and identify its predictors, shedding light on the unique challenges these healthcare professionals face and paving the way for effective interventions to enhance their well-being and improve patient outcomes.

In light of the Sustainable Development Goals (SDGs), specifically, SDG 3.4, which aims to reduce non-communicable disease morbidity by a third by 2030, the nursing workforce will play a critical role. However, nursing shortages, burnout, recruitment challenges, and a perception of complex care and hazardous work environment are some of the challenges that impede the growth and development of the nursing workforce (Challinor et al., 2020). In addition, while studies have been conducted in high-income countries to assess occupational stressors among healthcare providers, particularly among nurses working in pediatric oncology, there is a paucity of such studies in low- and middle-income countries (M. Zarenti et al., 2021).

It is essential to assess stress levels and stressors among Pakistan's pediatric oncology nursing workforce, which can lead to burnout, compassion fatigue, and job dissatisfaction (Weintraub et al., 2020). Such an assessment will enable organizations to identify areas of high stress and implement preventive measures to ensure that nurses provide optimal care to their patients and families. Given the large number of pediatric oncology patients in low- and middle-income countries with a limited number of specialized nurses, it is critical to provide a supportive environment that enhances job satisfaction and preserves the psychological health of nurses. The State of World Health Nursing Report 2020 highlights a global shortage of nursing workforce estimated at 5.9 million nurses, with 89% of this shortage in LMICs.

In conclusion, assessing the stress level and various stressors among pediatric oncology nurses in Pakistan is paramount to ensuring high-quality patient and family care. This assessment will also help identify variances in stress levels among nurses and enable effective methods to eliminate stressors, ultimately contributing to the preservation of the psychological health of nurses and enhancing their job satisfaction.

Study Purpose

To measure stress and identify its predictors among pediatric oncology nurses in Pakistan.

Research Question

1. What is the stress level of nurses working in pediatric oncology units in Pakistan?

2. What are the stressor among pediatric oncology nurses of Pakistan?

Significance of the study

This study is significant as it fills a research gap by addressing the lack of data on stress among pediatric oncology nurses in Pakistan (Mukherjee et al., 2014). This study has the potential to provide valuable insights into the prevalence of stress and its predictors in this specific context which can help healthcare organizations better understand and address the needs of pediatric oncology nurses in Pakistan. By identifying predictors of stress, the study can inform evidence-based interventions and support strategies (Mukherjee et al., 2014). The findings of this study can also have implications for creating guidelines targeting pediatric oncology, reforming healthcare policy and practice, and highlighting the need for interventions and support programs tailored to this population (Mukherjee et al., 2014). Ultimately, this study has the potential to

enhance pediatric oncology nurses' well-being and improve patient care in this specialized field of nursing (P. S. Hinds et al., 1998).

The Summary

This chapter highlighted the burden of cancer, the purpose of the study, the research questions and the significance of the study. Furthermore, this chapter also discussed stress level and their predictors among pediatric oncology nurses. The next chapter will briefly overview the literature review on the presenting research questions.

Chapter Two Literature Review

This chapter presents the literature review related to the stress level among nurses and associated stressors among nurses working in Pediatric Oncology units in Pakistan. It has been organised into three sections. The first section is about the search strategy used for this study. The second section describes the stress levels and stressors prevalent among nurses performing their duties in Pediatric Oncology units at global, regional, and national levels. The last section focuses on the stressor and its impact on the nurses. The chapter ends with a summary.

Search Strategy

A systemic and thorough literature review was conducted to find the latest and relevant articles on the prevalence of stress and stressor among pediatric oncology nurses in Pakistan.

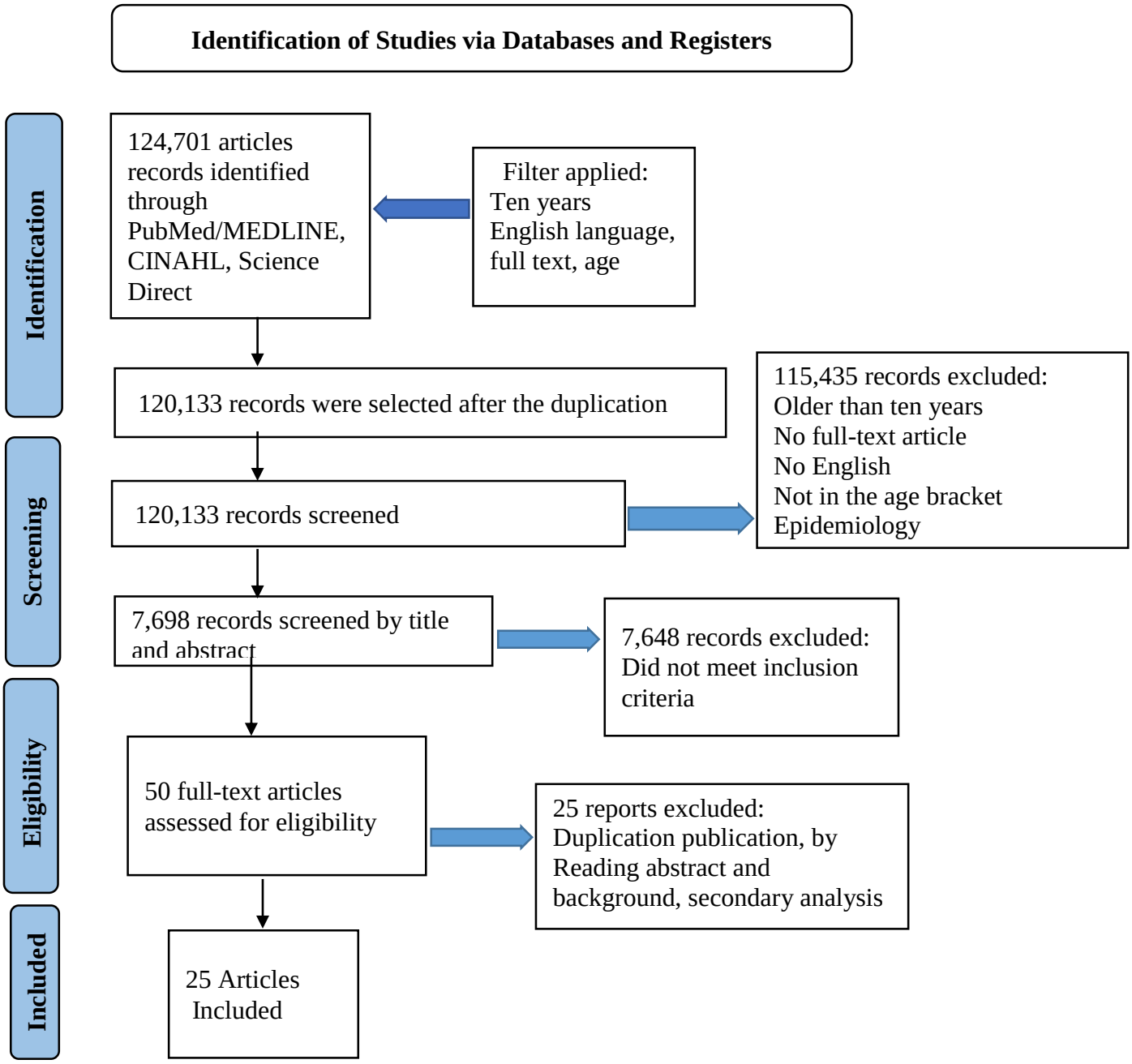
A comprehensive literature review was conducted using the Cumulative Index to Nursing and Allied Health Literature (CINAHL) plus PubMed and Scopus. The keywords utilised for the literature search were stress OR psychological OR anxiety OR burnout OR mental health OR occupational stress AND predictors OR Stressors OR determinants OR factors OR influences OR associated factors OR contributing factors OR risk factors OR occupational factors OR work-related factors AND pediatric nursing OR oncology nursing OR children nursing OR pediatric oncology nurse OR pediatric oncology healthcare professional AND pediatric oncology units OR pediatric cancer units OR children's cancer units OR pediatric oncology department OR pediatric oncology ward OR oncology clinics.

A total of 124,701 hits appeared from all the databases; these included 55,333 from Pubmed, 13,632 from CINHAL and 55,736 from Science Direct. They were reduced by applying filters such as last ten years, removing duplicates, full-text availability, English language, age, and species. In PubMed, 6,670 hits were retrieved, involving quantitative and qualitative studies

further reduced by title and abstract selection. In CINHAL, 363 hits appeared after filtration of 10 years, age, language, and full text, which were then further analysed based on title and abstracts. Lastly, in Science Direct, 665 articles were captured after filters of 10 years, age, full text, and English language. These results were then further reduced based on titles and abstracts.

The selected articles' abstracts were reviewed, showing that 50 articles were pertinent to the study's purpose and scope. After a comprehensive and inclusive review of the articles, 25 were appropriate to the study question. The articles retrieved mainly were from high-income countries, whereas a few studies were found from LMIC. Although a thorough examination of the existing literature has been conducted, there are currently no studies conducted in Pakistan that explore the stress and stressors experienced by pediatric oncology nurses who work in pediatric oncology units. The literature search is illustrated in the figure below (Figure 1).

Figure 1 Literature search strategy



Theoretical framework:

Betty Neuman system model provided a conceptual model for this study. As a flexible, holistic paradigm, the Neuman model focuses on the human being's requests for stress protection or its remedies based on individual responses to stress (Neuman, 1996). The NSM contains

Selye's Stress and Coping Theories and Lazarus' Stress and Coping. The NSM defines three important principles in nursing interventions: open client systems, boundary lines, and prevention. As open systems, humans are represented as concentric circles in Neuman's paradigm. Humans construct their habitats within and around themselves and consciously and accidentally interact with environmental stressors. Environmental stressors comprise intrapersonal components like a neurotic disposition, interpersonal factors like coworker relationships, and extra personal factors like long work hours. These stimuli have the potential to disrupt one's equilibrium.

According to Neuman's model, the client system is surrounded by four boundary lines: a fundamental resource for energy (core structure), lines of resistance, a conventional line of defence, and a flexible line of defence. These lines are linked to five other variables: physiological, psychological, social, developmental, and spiritual. Interacting variables are used to maintain and preserve a client's stability. The first circle of defence against stresses is the outermost line, a flexible line of defence. The five variables in the flexible line of defence can be nurtured to defend the second circle, the usual line of defence against environmental stressor aggression. When the typical line of defence is breached, the lines of resistance safeguarding the core structure go into action. As a result, when the client system cannot respond to stressors, lines of defence are damaged.

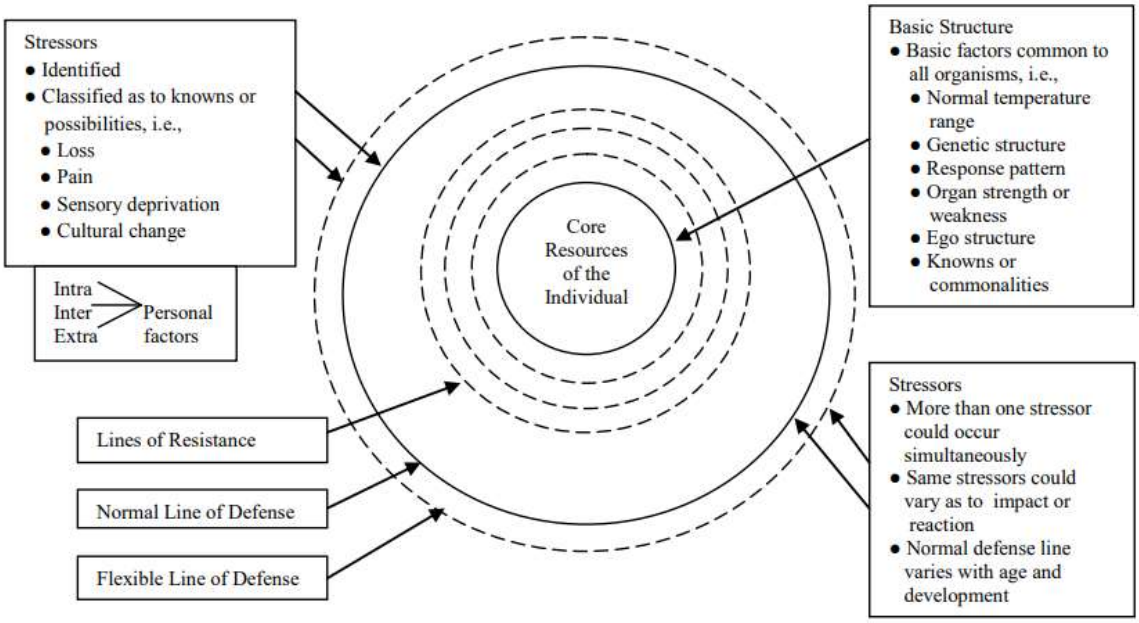


Figure 2 *Neuman System Model*

The NSM focuses on addressing stress within the entire environment defined by an open client system. This system includes individuals, families, groups, communities, and organisations ((Neuman, 1996). Nurses play a crucial role in evaluating how clients perceive stressors and examining their reactions across five interacting variables. Stressors can be identified, addressed, and corrected by implementing tailored nursing interventions. The NSM applies to the target population of this study, as oncology nurses often experience high stress levels in their demanding work environments. NSM provides guidance on primary prevention strategies to assist nurses in avoiding stress responses and secondary and tertiary prevention strategies to help them cope with stress reactions. Thus, this study aims to investigate specific stressors, stress levels, and coping behaviours among outpatient oncology nurses as an initial step in implementing stress management and nursing prevention interventions at all three levels. The

findings of this study are expected to be crucial, providing essential data for outpatient oncology nurses and their employers to raise awareness about stress and establish supportive work environments. Ultimately, reducing or preventing stress at work and promoting optimal wellness conditions for inpatient and outpatient oncology nurses are important goals (Idowu, 2022).

Stress among Pediatric Oncology Nurses:

Stress, as defined by the World Health Organization (WHO), refers to a series of physiological reactions that prepare the body for action. Occupational stress for healthcare professionals is influenced by various factors, including the nature of their work, organisation, and personal experiences. Numerous studies have explored the prevalence of stress among healthcare professionals working in pediatric oncology settings. A systematic review found that a considerable proportion of staff in pediatric oncology encountered stress within the challenging work environments and faced detrimental effects on pediatric oncology staff's well-being and job performance (M. Zarenti et al., 2021).

A study conducted examined the experiences of 89 oncology nurses in various cities, revealing that a significant majority, precisely 75% of the participants, reported negative impacts associated with their work in the oncology unit. Disturbingly, 25.4% expressed despair, 8.5% harboured concerns about their family member's potentially developing cancer, and 11.9% felt distressed by their perceived inability to make a difference. Although some studies have focused on the negative emotional implications of working with cancer patients, others have reported positive effects, such as improved interpersonal relationships, a heightened sense of self, a reevaluation of life's worth, and the emergence of new possibilities (Konukbay et al., 2019).

Although working in pediatric oncology is fulfilling, it is also inherently demanding. Pediatric oncology is regarded as a high-stress nursing specialty, primarily because of the

emotional vulnerability that healthcare professionals face in this domain. Nurses in pediatric oncology are expected to fulfil multiple roles, including providing care, educating patients and families, facilitating communication, acting as translators, offering support, and advocating for their patients. Consequently, occupational stress is an inevitable aspect of the work experienced by pediatric oncology nurses (Boyle & Bush, 2018).

In Jordan, a study was conducted using a Nurses Stress Scale (NSS) questionnaire, with over 360 nurses participating in a qualitative cross-sectional study. The results showed that oncology nurses experienced higher stress levels than ICU/CCU and ER nurses (Masa'Deh, 2016). In another survey research study conducted in New York with 42 oncology nurses, no substantial connection was observed between age and the extent of stress indicated by the NSS. Nonetheless, nurses who experienced higher stress levels were more inclined to consider leaving their current job. Nurses who responded "yes" to the question of their intention to leave had a higher stress level (mean = 2.14, standard deviation = 0.28) compared to those who answered, "no" (mean = 1.89, standard deviation = 0.314). This variation was statistically significant ($p = 0.013$) (Naholi, 2015).

In a descriptive study involving 89 oncology nurses from 12 different cities in Turkey, quality of life was assessed through a World Health Organization QOL Scale (WOQOL-BREF). When examining the overall quality of life among oncology nurses, none of the participants considered their quality of life excellent. Most nurses (61.8%) reported their quality of life as average, with neither a positive nor negative perception, on the other hand, 23.6% of the nurses reported poor quality of life, while 9% reported inferior quality of life whereas only a small proportion of oncology nurses (5.6%) perceived their quality of life as good (Ergun et al., 2005). A descriptive correlational study conducted in the southwest of Iran among nurses working in

oncology wards (n=180) showed moderately high moral distress, which had no significant difference regarding demographic characteristics. However, they did negatively correlate with the quality of life, i.e., nurses with decreased quality of life had high moral distress (Molazem et al., 2022)

In another similar study, workplace stress was assessed among Portuguese oncology nurses working in palliative care presented with significant workplace stress, of which factors such as death and dying, workload and uncertainty with treatment were of the high average score (Costeira et al., 2022).

In another mix method study which aimed to assess the spiritual well-being (SBW) of pediatric oncology nurses and their use of spirituality to cope with stress in the United States, quantitative analysis (n=130) showed moderated levels of stress and moderate to high levels of spirituality, a negative relationship was observed between stress and subjective well-being (SWB) ($r = -0.221$, $p = 0.011$), suggesting that decreased stress levels were linked to higher levels of SWB (Jane M Murphy et al., 2021)

According to a qualitative study in the Pediatric Oncology Unit of a teaching hospital in Ghana, eight subcategories emerged from two major categories, of which one was work stress; few individuals provided accounts of experiencing stress (Nukpezah et al., 2021). A qualitative study evaluated nurses' experience working in pediatric oncology. The study revealed five main themes: attachment, supportive care, repression of feelings, sense of helplessness, and the need for support. These emotional impacts can cause stress for the nurses (Borhani et al., 2013).

Stressful Factors/ Stressors in Pediatric Oncology Nursing

Pediatric oncology nursing is a demanding field that exposes nurses to distinct stressors associated with the care of children with serious illnesses (J. M. Murphy et al., 2021).

Socio-demographic factors

A qualitative study in a Saudi Teaching University Hospital's oncology ward discovered that most participants, regardless of gender, reported experiencing significant stress levels during their work (D. Y. Wazqar, 2019). In a different study conducted in Southeast Nigeria, the impact of work-related stress and burnout on nurses was investigated through a cross-sectional and correlational approach. Various socio-demographic factors were taken into consideration. Out of the socio-demographic factors examined (age, work environment, and experience), only gender was found to have a significant correlation with work-related stress, work stress happens when there's a mismatch between the things your job requires you to do and what you feel capable of doing. However, none of these factors were found to have a significant relationship with burnout among nurses. This suggests that apart from the meaningful correlation between gender and work-related stress, none of the factors examined displayed a significant connection with stress and burnout among nursing professionals (Ezenwaji et al., 2019).

Moreover, a descriptive correlational study conducted in Isfahan (n=67) showed that the most influential demographic factor was work experience compared to empathy. This study revealed that the nurses with more work experience in the oncology ward had a greater level of empathy; there was no significant correlation between empathy, burnout with gender, educational level, and marital status of nurses (Taleghani et al., 2017). In contrast, another cross-sectional descriptive study from Taiwan concluded that nurses who were more emotionally stable and were in a marital relationship had lower levels of compassion fatigue (Chen et al.,

2018). In another survey-based study conducted in New York among 42 oncology nurses, the analysis showed that there were no notable correlations observed between age ($p = 0.055$), work experience ($p = 0.191$), nurses' intention to leave their present job ($p = 0.109$), and the utilisation of coping strategies among newly employed oncology nurses (Rowida Mohammed Naholi, 2015).

Workload and Organisational Factors

The well-being of pediatric oncology staff is significantly impacted by various stressors identified in recent literature; these stressors encompass a range of factors that contribute to the occupational stress experienced by healthcare professionals in this field. According to a systematic review conducted by Maria Zarenti et al. (2021), heavy workload, long working hours, exposure to emotionally and traumatically challenging situations, lack of resources, communication challenges, and inadequate support systems were major stressors among pediatric oncology staff. These stressors have a detrimental effect on the well-being of staff members and significantly impact their ability to cope with the demands of their profession.

Emotional and Psychological Demands

The literature supports the recognition of these stressors in the field of pediatric oncology nursing (J. M. Murphy et al., 2021). For instance, witnessing the suffering of young patients and delivering difficult news to families are common stressors experienced by pediatric oncology nurses (J. M. Murphy et al., 2021). These stressors profoundly impact nurses' well-being and job satisfaction in this field.

Communication Challenges and Support Systems

The consequences of prolonged exposure to high stress levels among pediatric oncology staff have been highlighted in the literature. These consequences include burnout, compassion

fatigue, decreased job satisfaction, impaired decision-making, and compromised patient care (M. Zarenti et al., 2021). These outcomes underscore the urgent need to address stress and implement effective support systems for healthcare professionals in pediatric oncology settings.

Another study by Lioka et al. (2022) identified several stressors specific to pediatric oncology nursing. These stressors encompass high workloads, long working hours, emotional and psychological demands, witnessing patient suffering, ethical dilemmas, communication challenges, and organisational factors. These findings shed light on pediatric oncology nurses' significant stressors and provide a foundation for understanding the factors contributing to their occupational stress. In another qualitative study conducted with 14 novice nurses regarding communication with less than one year of experience, six major themes emerged which underline the hesitance in communicating with the patients and their families (Hendricks-Ferguson et al., 2015).

Effective communication skills are crucial in the challenging field of pediatric oncology nursing. Caring for children with cancer can be emotionally taxing, and connecting and communicating with them and their families is essential to providing the best possible care. However, undergraduate education often lacks sufficient training in communication skills, leaving pediatric oncology nurses emotionally vulnerable. While nurses may learn communication skills on the job through observation and learning from mistakes, this learning approach has limitations. Nurses may struggle to find the right words, hesitate to address sensitive topics, and become emotionally disengaged during difficult conversations. As a result, nurses risk experiencing burnout, compassion fatigue, moral distress, and nurse grief. Limited research has been conducted on these work-related consequences in pediatric oncology nursing and interventions to mitigate their impact (Boyle & Bush, 2018).

Personal and Professional Preparedness

Oncology nurses face various sources of work stress, including role conflicts, lack of control and organisational barriers such as nurse shortages, limited facilities and equipment, and inadequate payment (Soheili et al., 2021). Senior staff's lack of support and understanding was identified as a prominent and stressful aspect among oncology nurses. Furthermore, the study highlighted that feeling inadequately prepared to meet the emotional demands of patients and their families, lack of experience, and a lack of confidence in providing appropriate care to dying patients were significant sources of work stress for oncology nurses; these findings emphasise the importance of addressing these stressors and providing necessary support, resources, and training to enhance the well-being and quality of work for oncology nurses in a university teaching hospital setting (D. Y. Wazqar, 2019).

Strategies to Mitigate Stress:

Stress management is a critical aspect of maintaining a healthy work environment, and there are several ways to achieve this goal. At the organisational level, improving staffing and creating a supportive work environment fostering a positive and productive atmosphere is essential. At the individual level, stress management training and self-care strategies can help employees learn effective coping mechanisms to manage their stress levels. Additionally, systemic changes such as policy reforms and enhanced social support networks can significantly reduce stress among staff members. By implementing these interventions, organisations can create a healthier and more productive workplace for everyone involved (M. Zarenti et al., 2021).

In a study conducted by St Jude's Hospital in Tennessee to reduce compassion fatigue among pediatric oncology, nurses recommended some individual (such as self-care, eating healthy, sleep, exercise, medication and prayers and relaxation techniques) and organisational

level interventions (such as support groups, team building, mentorship and continuous education) as successful strategies to reduces the level of stress and compassion fatigue (Sullivan et al., 2019).

Various forms of emotional support can effectively address the grief and loss-related emotional consequences experienced by pediatric oncology nurses. Group interventions, such as peer support groups and storytelling sessions, can promote peer support and facilitate the grieving process. Individual consultations with counsellors, social workers, or clerics are also beneficial, especially when available on-site. Time-limited interventions, crisis lines, and designated personal time for nurses to regroup are additional forms of support (Boyle & Bush, 2018).

Pediatric oncology nurses need coping strategies to handle stress and care for their well-being. These coping strategies can be categorised into two groups: functional and nonfunctional. Functional coping strategies among oncology nurses encompass establishing boundaries at various levels. These included personal boundaries, such as separating working hours from leisure time, and group-level boundaries, such as developing new routine tasks within the oncology units. Nurses have developed effective methods for managing their stress levels while attending to the demands of their profession. Seeking support from loved ones and patients, engaging in enjoyable activities with colleagues, and utilising humour as a coping mechanism have proven beneficial.

Furthermore, nurses have employed additional coping mechanisms, such as positive re-evaluation, problem-solving, maintaining self-confidence, seeking social support, and adopting optimistic attitudes. Nurses must extend their coping strategies beyond the workplace and create opportunities for relaxation and rejuvenation in their personal lives (Ko & Kiser-Larson, 2016).

According to a recent cross-sectional study at the University of Massachusetts Lowell, half of the surveyed pediatric nurses reported feeling stressed. Interestingly, these nurses' age and years of experience did not appear to correlate with the levels of secondary traumatic stress they experienced. However, when examining coping responses, it was observed that nurses with higher scores in emotional and instrumental support (practical or tangible assistance that people receive from other) also displayed higher scores in secondary traumatic stress. Moreover, there was a correlation between the adoption of denial and behavioural disengagement coping strategies and an increase in secondary traumatic stress scores (Kellogg et al., 2018).

According to Jane M Murphy et al. (2021), nurses in this field use coping strategies that are both spiritual and general. General strategies involve seeking social support and practising self-care, effectively alleviating stress and promoting resilience. Additionally, the study highlights the importance of spiritual coping, showing that nurses with higher spiritual well-being exhibit greater resilience and better coping abilities. Spiritual coping involves prayer, meditation, and finding solace in faith. These findings underscore the need to consider nurses' spiritual well-being when implementing interventions to reduce stress and enhance overall well-being. Rituals and ceremonies for the patient and the nurse can help honour and celebrate life and provide a shared outlet for collective grief. Grieving families can indirectly impact the emotional state of nurses, which is why creating memory items or sending sympathy cards can help provide closure for everyone involved. Finding meaning in one's nursing practice, acknowledging the secondary benefits, and engaging in activities such as journaling can help nurses derive personal fulfilment and cope with their emotional challenges (Boyle & Bush, 2018).

Gap Analysis

Existing literature contains studies performed in HIC and LMIC to assess the prevalence of stress and its associated stressor on pediatric oncology nurses. There were no studies conducted in Pakistan. Considering the increasing nursing stress and various associated factors, it is important to carefully evaluate the stress level and its predictors among the sensitive population providing care as a first line.

The literature review concluded that studies had been done in HIC and LMIC; however, to the researcher's knowledge, there were no studies in Pakistan. Hence, a research gap exists regarding stress and its predictors in pediatric oncology nurses in Pakistan. Therefore, the study has contributed to the research and assisted in generating baseline data on stress and stressors among Pakistani pediatric oncology nurses.

The Summary

This chapter comprehensively examines the literature on stress level among nurses working in Pediatric Oncology units in Pakistan and explores the associated stressors. The chapter is organised into three sections. The first section describes the search strategy employed to gather relevant information for this study. The second section provides an overview of the stress levels experienced by nurses in this context, examining global, regional, and national perspectives. It also explores the various stressors contributing to these nurses' heightened stress levels. The third section focuses on the identified stressors and their impact on nurses' well-being and job performance in Pediatric Oncology units. It discusses the specific stressors prevalent in this setting and their implications for the nurses' physical and mental health.

Chapter Three: Methodology

This chapter represents the methodology used in this research study. It comprises an elaborate description of the study design, the study setting and the population, the sample strategy, the participants' recruitment plan, the sample size, and the study variables, including the conceptual and operational definitions.

Moreover, this chapter also illustrates the data collection processes. Furthermore, this chapter discusses the tools used, which are Perceived Stress Scale (PSS) and Stressor Scale for Pediatric Oncology Nurses (SSPON), data entry and management, and data analysis. Lastly, the ethical considerations that have been taken into consideration during the study have been described, followed by a brief summary of the chapter.

The Study Design

An analytical cross-sectional study design was used to identify the level of stress and stressors among pediatric oncology nurses working across different hospitals in Pakistan. Neuman's model views individuals as dynamic systems that interact with and respond to stressors in their environment. Neuman's model emphasizes the importance of understanding the immediate response of individuals to stressors, and the cross-sectional design allows researchers to assess these responses within a defined timeframe. Moreover, this research design aimed to help in identifying the level of stress and its predictors among nurses currently working with pediatric oncology patients (Polit & Beck, 2017).

The Study Setting

This study was conducted in pediatric oncology units of all hospitals that entertain pediatric oncology patients across Pakistan. The study settings included inpatient, outpatient, daycare, clinics, and the emergency department of private, government and semi-governmental hospitals across Pakistan which are registered with the Pakistan Society of Pediatric Oncology (PSPO). From the below-mentioned list of hospitals, 20% are private hospitals; 7% are military/ armed forces hospital; 13% are shared care centres; and 60% are government hospitals 14 hospitals being tertiary care centres; and 1 is a primary care centre. The purpose behind different study settings was to provide a broad picture of the underlying cause of stressors at various levels and different capacities of the hospitals. Among the different hospitals (Table 1), there are approximately 150 nurses working in various capacities such as bedside, floor charge nurses, nurse managers and infection control nurses. The study was conducted from July 2023 till September 2023 in all Pediatric oncology units/ Hospitals across Pakistan.

Table 1 List of Hospitals and Nurses

Sr No.	**Hospitals**	**Types**	**Locations**	**Number of nurses working in Pediatric Oncology**
1	The Aga Khan University Hospital	Tertiary care, private	Karachi, Sindh	8 nurses 1 head nurse 1 manager

2	Indus hospital and Health Network	Tertiary care, private	Karachi, Sindh	35 nurses 3 head nurses 2 assistant head nurses 2 Clinical Nurse Instructor (CNI)
3	National Institute of Child Health	Tertiary, Government	Karachi, Sindh	10 nurses 1 head nurse 1 Infection control nurse/Nurse educator
4	Children Hospital, Multan	Tertiary, Government	Multan, Punjab	4 nurses 1 head nurse
5	Shoukat Khanum Memorial Cancer Hospital and research center, Lahore	Tertiary, Private	Lahore, Punjab	50 nurses

6	The Children's Hospital University of Child Health and Sciences, Lahore	Tertiary, Government	Lahore, Punjab	29 nurses
7	Lahore General Hospital	Tertiary, Government	Lahore, Punjab	6 nurses 1 head nurse (Peads) 1 administrator (Peads)
8	MAYO Hospital Unit 1 and 2	Tertiary, government	Lahore, Punjab	2 in charge nurses 12 nurses
9	Pakistan Institute of Health Science	Tertiary, Government	Islamabad, Punjab	6 nurses 1 head nurse
10	Children Hospital	Tertiary, Government	Faisalabad, Punjab	6 nurses 1 head nurse
11	Bahawalpur Victoria Hospital	Tertiary, Government	Bahawalpur, Punjab	6 nurses 1 head nurse

12	DHQ Badin	Primary, Public private partnership	Badin, Sindh	--
13	POU Shaikh Zayad Hospital Quetta	Tertiary, Public private partnership	Quetta, Baluchistan	16 nurses 1 head nurse
14	Holy Family Hospital	Tertiary, Government	Rawalpindi, Punjab	6 nurses 1 head nurse
15	Combined Military Hospital	Tertiary, Government/ Military Hospital	Rawalpindi, Punjab	6 nurses 1 head nurse

Note. A list of nursing staff in Pediatric oncology units/ Hospitals across Pakistan.

The Study population

The study population comprised all registered nurses currently working in pediatric oncology units, including bedside and management (such as nurse manager, head nurse and matron) of the pediatric oncology units. There were around 150 registered nurses from 15 different public and private hospitals; these hospitals were part of the Pakistan Society of Pediatric Oncology (PSPO) from all across Pakistan. The response rate was calculated by dividing the number of responses to that of the total population (Fincham, 2008). The study response rate was 71%, and according to Dr Fincham (2008), the response rate of 60% and above for most research studies should be the research goal.

The Sampling Strategy and Sample Size

The total population sampling technique was used as a sampling strategy. The total population sampling technique is a sub-branch of purposive sampling in which the total population of participants comprising specific characteristics are recruited (Banerjee & Chaudhury, 2010). Since Pediatric oncology nurses happen to be a highly specialised group and few in number; therefore, it was appropriate to take on board all the participants (total population) to have a better understanding. Thus, 150 nurses from 15 different hospitals that are currently under the PSPO umbrella (as per the information provided to the researcher) were invited to participate in the study (Refer to Table 2).

Participant Recruitment

Prior to the data collection process, approvals were obtained from the Ethical Review Committee (ERC) of the Aga Khan University Hospital, Karachi Pakistan (Appendix C), along with permission letters from the Chief Medical Officer (CMO) (Appendix A) and Chief Nursing Officer (CNO) (Appendix B). Additionally, an agreement to participate letter was also obtained from PSPO (Appendix D), which provided a platform for the researcher to conduct the study under their umbrella and supervision. Similarly, the hospitals, the head of department for pediatric oncology and participants were sent invitation emails and WhatsApp messages for their convenience. Moreover, all the registered nurse (RN), including both bedside and management (such as nurse manager, head nurse, and matron), who are currently working with pediatric oncology patients in inpatient, outpatient, daycare, emergency rooms or clinics, were invited to participate in the survey. Also, the aim of the study and the potential benefits were clearly written in simple language for the participants to understand. Furthermore, informed consent was

obtained through the survey questionnaire website link (Appendix E). Those participants who signed the consent were given the actual questionnaire.

The Study Variable

The variables of the study were categorised into two parts: dependent and independent variables. Below mentioned are the details of the study's variables:

Independent Variables

The independent variables in this study were the socio-demographic characteristics of the participants such as age, gender, marital status, education level, job designation/role, years of experience, years of working experience in pediatric oncology, type of hospital, and the area of specialty.

Dependent Variables

Dependent variables in this study were stress levels and stressors among pediatric oncology nurses which were assessed through two different tools: the Perceived Stress Scale (PSS) to assess the levels of stress among nurses and the other was the Stressor Scale of Pediatric Oncology Nurses (SSPON). The conceptual and operational definitions of the dependent variables discussed in this study are as follows:

Conceptual Definitions

The following are the conceptual definitions that were used in the study:

Stress Level. Stress is commonly described as an internal response to challenges within the physical, social, or psychological aspects of an individual's environment, potentially disrupting their equilibrium (Gray-Toft & Anderson, 1981; Lee, 2007). Stress can be categorized into two main forms: acute stress, which is the immediate response to real and imminent threats

like traffic congestion or a job interview, and chronic stress, which results from enduring recurrent stressors such as persistent work-related pressures or ongoing financial concerns (Crosswell & Lockwood, 2020).

Stressors (Factors). Stress factors, often referred to as stressors, can be described as "Any factors that generate stress within the internal and external confines of client systems." These stressors can be categorized into five types: physiological, psychological, sociocultural, developmental, and spiritual stressors. (Ko & Kiser-Larson, 2016).

Operational Definitions

The following are the operational definitions that were used in the study:

Stress Levels. The stress level of pediatric oncology nurses was measured by using Perceived Stress Scales (PSS), which was a 10 item self-reported instrument used to assess the level of stress experienced by an individual during the past month. This instrument assesses stress related to workload, interpersonal relationships, and personal factors over the past month. The total score ranges from 0 to 40, with higher scores indicating higher levels of perceived stress.

Stressors. Stressful factors for pediatric oncology nurses, with respect to their workplace role, were measured by a mean score of six sub-scales of the Stressor Scale of Pediatric Oncology Nurses (SSPON). The six sub-scales, including co-workers, system demands, knowing what limitations of care, emotional demands, and dying with grace (P. S. Hinds et al., 1990), were assessed. Each sub-scale was scored on a specific range, providing detailed insights into the specific stressors experienced in each domain.

The Data Collection Process

The data was collected from July 2023 till September 2023. Prior to data collection, the ERC's approval was obtained from the Ethical Review Committee (ERC). Alongside, the permission letters from the Chief Medical Officer (CMO), the Chief Nursing Officer (CNO) and the Pakistan Society of Pediatric Oncology (PSPO) were secured, each of whom assisted in disseminating the questionnaire to the Pediatric Oncology Nurses in the identified 15 hospitals. Moreover, an official email was sent through the PSPO platform to all the hospitals HODs and the Nursing leads for their participation in this study. The purpose and aim of the study were well defined in the email. Next, a self-administrative questionnaire link was shared in the email and also sent to nurses using WhatsApp for their convenience. In addition, 5 number of reminders over the period of 7 days, 15 days 25 days were sent via email to have the questionnaire completed in due time.

The Data Collection Tool

The following data collection tools were used in the study:

The Demographic Details

Few questions regarding the participants' demographics were obtained at the post-consent stage. Moreover, the demographic data obtained comprised age, gender, residence, marital status, maximum qualification, current job designation, hospital's name, type of hospital, area of speciality in pediatric oncology, years of experience working in pediatric oncology and whether they have received any specialised training in pediatric oncology or not.

The Other Tools Used in the Study

Two tools were used in this survey: one was the Perceived Stress Scale (PSS), this tool was used to assess the level of stress among pediatric oncology nurses, and the other was the Stressor Scale for Pediatric Oncology Nurses (SSPON) which was designed to determine the stressor for the nurses working in pediatric oncology.

Moreover, written permission for the use of Stressor Scale for Pediatric Oncology Nurse (SSPON) was obtained from the lead person who developed the questionnaire (Appendix I). However, the other tool, Perceived Stress Scale (PSS), was an open access tool and did not require permission from the authors. Since the tool was originally in the English language, it did not require translation in the native language of the research population, as the study population was nurses who could understand the English language.

The Perceived Stress Scale (PSS)

The Perceived Stress Scale (PSS) is a commonly used tool for measuring stress levels in individuals (Cohen et al., 1983). Furthermore, the Perceived Stress Scale (PSS) is a commonly employed self-assessment tool that gauges an individual's perception of stress experienced within the preceding month. It comprises 10 items, each rated on a 5-point Likert scale, spanning from 0 (never) to 4 (very frequently), with higher scores indicating higher levels of perceived stress were as a few questions were reversed numbered (Appendix G). Thus, the participants were to be instructed to indicate the extent to which they had experienced specific stress-related thoughts and feelings over the past month through using the aforementioned tools.

In the field of pediatric oncology nursing, the PSS has been utilised to explore the stress experienced by patients and healthcare professionals and to assess the effectiveness of stress

reduction interventions. Moreover, it has helped in identifying specific stressors related to the illness experience, such as hospitalisation, procedures, treatment's side effects, and disruptions to normal daily life. Furthermore, the PSS has been particularly valuable in evaluating the stress levels experienced by healthcare professionals, including nurses, working in pediatric oncology settings (Masa'Deh, 2016).

Additionally, the Perceived Stress Scale (PSS) has been shown to be a reliable and valid measure of perceived stress. There are various studies that have shown to have a good reliability of 0.78 to 0.9.Cohen and colleagues (1983), (Lee, 2013). The PSS has also demonstrated good construct validity, with studies showing significant correlations between the PSS scores and other measures of stress, anxiety, and depression, and Cronbach's alpha coefficients ranging from 0.78 to 0.91 (Andreou et al., 2011; Cohen et al., 1983). Also, the PSS has been shown to be sensitive to changes in stress levels over time (Cohen et al., 1983).

The Stressor Scale for Pediatric Oncology Nurses (SSPON)

Stressor scale for pediatric oncology nurses is a self-reporting tool comprising 50 items highlighted by pediatric oncology nurses as work-related stressors. This included internal and external factors that produced or triggered a physical and psychosocial response, which were to be used in the study. This tool was developed by Hindes et al. (1990). The stressors were represented in a visual analog scale. All these 50 items could be ranked from 0 to 100 score. Thus, the higher was the score, the greater was the level of stressor. The total score can range from 0 to 5,000. Moreover, the tool had been sub-categorised into 6 categories: Co-workers (6 items), system demands (12 items); knowing what is ahead (5 items); limitation of care (12 items); emotional demand (13 items); dying with grace (2 items). Furthermore, the reliability of

the tool was done by test and retest, the correlation coefficient was 0.88 and the total scale alpha coefficient was 0.94 (P. S. Hinds et al., 1990) (Appendix H).

Meanwhile, this tool has also been used by other researchers (de Carvalho et al., 2005); Ercan et al., 2019; (Hinds et al., 2003); (Wu, 2016), & (Barnard, 2006)), with Cronbach alpha score falling in the range of 0.93 to 0.977.

The Data Management

The data entry and management were done by the researcher. Moreover, the tool was transferred to qualtrics.com, a link that was prepared and circulated via electronic medium to pediatric oncology nurses. However, only the principal investigator and supervisor had access to the survey data. The data was then exported to the statistical package for social sciences (SPSS) version 21.0 by the researcher by signifying each response with a serial number. Lastly, for the missing data, the imputation (substituted missing data for the survey's median value or uses the most common answer) method was used.

The Data Analysis

The data was analysed using a descriptive statistical approach, using the independent t test, ANOVA (one-way analysis of variance) and Pearsons test utilising a Statistical Package for Social Science (SPSS) version 21.0. Next, the analysis for the total score, analysis for score by subcategory and further analysis by each demographic variable and work experience was conducted. Also, the mean, standard deviation, and min/max scores (range) were computed to determine the stressors and frequencies, and the proportions were calculated to determine the participants' demographic data.

Moreover, by incorporating Neuman's Systems Model into the data analysis phase, the study aims to uncover not only the prevalence of stressors but also the intricate interplay between individual and environmental variables, contributing to a more holistic understanding of the complex dynamics within the pediatric oncology nursing profession.

The Descriptive Analysis

From the data collected, descriptive analysis was performed on the socio-demographic characteristics of the participants such as; age, gender, marital status, education level, years of experience, area of specialty, job designation/role, area where they were living, any specialised trainings they had received (if any) and its details. For quantitative data, appropriate tests were applied and a mean with standard deviation and median with interquartile range were reported. Moreover, for qualitative data variables, frequencies and percentages were reported. Variables with normal distribution were expressed as a mean with standard deviation), and for asymmetrical distribution, a median with interquartile range were reported for categorical variables. Furthermore, measurements like central tendency to assess normality (the mean, 95% confidence interval, and the median and mode), the dispersion (standard deviation, interquartile range), and location (upper and lower quartiles) was used. Likewise, for nominal and ordinal data, frequencies and percentages for all the defined characteristics were reported.

The Inferential Analysis

To assess the stress level, the mean score of the 10 items was calculated in order to identify the level of stress among nurses. Moreover, to assess the stressors, the mean scores of the six subscales of the SSPON were calculated. Furthermore, independent t-test was applied to all continuous demographic variables such as the years of experience, the level of stress, along with various work settings in pediatric oncology. Moreover, other categorical data such as

marital status and specialised training in pediatric oncology were described by frequency table. One way ANOVA was performed to determine whether stress levels of pediatric oncology nurses was varied among different types of hospitals (public, private and semi-government), along with the stressors. Person corelation was applied to the categorical variables with the levels of stress.

The Ethical Consideration

The Aga Khan University Hospital's Ethical Review Committee approval was sought prior to the commencement of the study. Moreover, permission was also obtained from the Chief Medical Officer (CMO) and the Chief Nursing Officer (CNO). Next, the participants were requested to sign an electronic consent form that entailed essential information about the research such as its purpose, the aims and its significance. Likewise, the ethics of Online surveys were ensured by clearly stating the intent and purpose of the study and the eligible participants were provided with an online consent before starting the survey.

Throughout the period of the study ethical implications of maintaining confidentiality and data privacy of participants were kept at utmost priority. Maintaining confidentiality involved protecting their identity and personal information of the participants, while data privacy involved ensuring that participant responses were kept secure and not accessible to unauthorized individuals. To ensure confidentiality and data privacy, a secure online platform for data collection, where participant responses are encrypted and stored on a password-protected server was used. The use of a unique identifier rather than participant names assisted in helping maintain confidentiality (Bos, 2020). The participants were ensured about the confidentiality of the data and anonymity. It was also stated clearly in the invitation email that we will not track

back any information via their e-mail address, IP address, or other information that you could attempt to capture that they do not voluntarily provide. Participants were informed that this research is purely educational and no funding was obtained from any sources. The results of the survey will be shared with the participants (Gupta, 2017). The data obtained will be securely preserved at the participating hospital for 7 years.

Participation was voluntary and no incentives were offered to participate in the study. The participants also had the right to withdraw from the study at any given time.

The Summary

This chapter focused on the study design, the study settings, the population, the sampling technique, and the recruitment plan for the participants. Moreover, this chapter also discussed the dependent and independent variables and their operational and conceptual definitions. In addition, the two tools used for data collection were also elaborated and detailed. Furthermore, the process of data collection, data entry and management and data analysis were also explained. Lastly, the ethical considerations followed in the study were mentioned.

Chapter Four: Results

This chapter represents the findings of the study. It is divided into three sections: The first section describes the socio-demographic characteristics of the nurses. The second section describes the level of stress among the nurses working in the pediatric oncology units using the Perceived stress scale (PSS). The third section discusses the predictors associated with the stress using the stress scale for pediatric oncology nurses (SSPON). Finally, the last section describes the difference between the socio-demographic data and their work setting, along with stress level among pediatric oncology nurses in different types of hospitals and their stressors.

The Socio-Demographic Characteristics of Participants

The socio-demographic characteristics of nurses working in the pediatric oncology units across Pakistan are mentioned in Table 1. Out of a total population of 150 pediatric oncology nurses from 15 different hospitals across Pakistan, 108 pediatric oncology nurses participated in the study (response rate 72%). The mean age of the participants was 31±5.44 (range 22 – 51 years), with the majority of participants ranging from 21- 30 years. Furthermore, there was a higher proportion of females (n=70) as compared to males (n=30). Moreover, 57% (n=61) of the participants were married. 57.4% (n=62) of the nurses had post-RN BScN degree, followed by 31.5% (n= 34) who had a Bachelor, and only 9.3% (n=10) Master level education.

The majority of the participants belonged to a private hospital (n=70). Meanwhile, 82% (n=88) were nurses working at the bedside and 19% (n=20) were from the administration side. The majority, 68% (n=63) nurses were working in the inpatient/ward area. Moreover, the majority of the participants ranged from 21 to 30 years old. The mean of total work experience inclusive of working in pediatric oncology was 8.01 ± SD=5.11(range - 25 years), whereas the mean for work experience, specifically in pediatric oncology, was 5.88 ± SD=3.77 (range: 1-20

years old). In addition, with regards to training, 63% (n=68) had received specialised training in pediatric oncology nursing (Table 2).

Table 2 Socio-demographic Characteristics of the Participants

Characteristics	n	(%)
Age in years (mean ± SD)	**30.78 ± 5.4**	
Categories of age		
21-30 years	62	57.4%
31-40 years	38	35.1%
41-50 years	7	6.5%
51-60 years	1	0.9%
Gender		
Male	38	35.2%
Female	70	64.8%
Marital status		
Single	47	43.5%
Married	61	56.5%
Type of Hospital		
Private	70	64.8%
Government	26	24.1%
NGO/semi-government	10	9.3%
Armed Forces	2	1.9%
Educational degree		
Diploma	2	1.9%
Bachelors	34	31.5%
Post RN BScN	62	57.4%
Masters	10	9.3%
Designation		
Bedside nurse	88	81.5%
Charge nurse/head nurse	11	10.2%
Nurse Manager	3	2.8%
Others	6	5.6%
BMT Nurse	1	0.9%
Assistant Head Nurse	2	1.9%
Clinical Nurse Instructor	3	2.8%
Area of specialty		
Inpatient/ Wards	68	63%
Outpatient/ Clinics	4	3.7%
Daycare	24	22.2%
Emergency Room	12	11.1%
Years of Experience (mean ± SD)	**8.01 ± 5.12**	
1 - 5 years	39	36.1%
6- 10 years	45	41.6%
11- 15 years	14	12.9%

16-20 years	7	6.4%
21-15 years	3	2.7%
Years of experience in the Pediatric Oncology unit	**5.76 ± 3.84**	
1- 5 years	60	55.5%
6- 10 years	39	33.3%
11-15 years	7	6.4%
16- 20 years	2	1.8%
Specialised Training*		
Yes	68	63%
No	40	37%

Note. The table sums up the various socio-demographic profiles of the nurse participants of this study.

*Specialized Training: this refers to the any training/course/workshops attended which had specific information regarding Pediatric oncology (disease process, nursing care, infection control etc)

The Perceived Stress Scale (PSS)

The total perceived stress scale among the pediatric oncology nurses fell in the moderate range, with a means of 21.12 ± SD=4.65 (range 9 - 29). 8.3% (n=9) had low level of stress, 78.7% (n=85) had moderate stress and 13% (n=14) had severe stress (Table 3 and Table 4)

Table 3 The Perceived Stress Score (PSS) Categories

PSS Tool		**Average Score Means ± SD**	
Total PSS score		**21.12 ± 4.6**	
Scores	**Categories**	**Frequency**	**Percentage**
0-13	Low Stress	9	8.3%
14-26	Moderate Stress	85	78.7%
27-40	Severe Stress	14	13%

Note. This table exhibits the stress levels of the nurse participants through the PSS test.

Table 4 The Perceived Stress Score (PSS) Individual Items Frequencies

Sr. Number	Items	n (%)				
		0 Never	**1 Almost Never**	**2 Sometimes**	**3 Fairly Often**	**4 Very Often**
1	In the last month, how often have you been upset because of something that happened unexpectedly?	3 (2.8%)	8 (7.4%)	72 (66.7%)	23 (21.3%)	2 (1.9%)
2	In the last month, how often have you felt that you were unable to control the important things in your life?	5 (6.4%)	4 (13.0%)	66 (61.1%)	13 (12.0%)	10 (9.3%)
3	In the last month, how often have you felt nervous and stressed?	3 (2.8%)	18 (16.7%)	69 (63.9%)	8 (7.4%)	10 (9.3%)
4	In the last month, how often have you felt confident about your ability to handle your personal problems?	3 (2.8%)	35 (32.5%)	56 (51.9%)	13 (12.0%)	1 (0.9%)
5	In the last month, how often have you felt that things were going your way?	2 (1.9%)	32 (29.6%)	58 (53.7%)	15 (13.9%)	1 (0.9%)
6	In the last month, how often have you found that you could not cope with all the things that you had to do?	0 (0%)	0 (0%)	107 (99.1%)	0 (0%)	1 (0.9%)
7	In the last month, how often have you been able to control irritations in your life?	0 (0%)	42 (38.9%)	49 (45.4%)	15 (13.9%)	2 (1.9%)
8	In the last month, how often have you felt that you were on top of things?	10 (9.3%)	19 (17.6%)	55 (50.9%)	21 (19.4%)	3 (2.8%)
9	In the last month, how often have you been angered because of things that happened that were outside of your control?	0 0	13 12.0	70 64.8	17 15.7	8 7.4
10	In the last month, how often have you felt difficulties were	2 (1.9%)	19 (17.6%)	70 (64.8%)	17 (15.7%)	0 (0%)

	piling up so high that you could not overcome them?

Note. This table exhibits the individual item frequencies of the the PSS test.

The Stress Scale for Pediatric Oncology Nurses (SSPON)

The stressor among pediatric oncology nurses was assessed by the stressor scale for the pediatric oncology nurse tool. The subscale and individual items mean are mentioned in Table 4. The average score of the subscale with the highest mean were reported in knowing what is a head (73.49 ± 1.92), followed by limitation to care (73.36 ± 2.01) and system demands (71.43 ± 2.56). However, the coworker subscale was described as the lowest (70.53 ± 2.13).

Table 5 The Average Score of Individual Items for SSPON

Sr. No.	Statements	Average score Mean ± SD
A	**Co workers**	**70.53 ± 2.13**
1	Feeling a coworker doesn't care enough about doing a good job.	68.71 ±11.6
2	Working with someone I don't think is competent	68.19 ±10.7
3	Feeling we have waited too long to do something that could help a patient	73.44 ± 13.8
4	The coworker not taking the initiative when there is work to be done	71.99 ±14.4
5	When nurses and doctors are not communicating well about patients	71.72 ± 11.1
6	When other professionals do more than they are qualified to do	68.15 ± 13.0
B	**System demands**	**71.43 ± 2.56**
1	Coworker calls in sick when I know that's not true	66.61 ± 13.3
2	Not being able to get a prompt enough response from a doctor	70.65 ± 12.8
3	Dealing with families who do not speak English	75.26 ± 13.1
4	Not being able to get caught up	68.75 ± 12.2
5	When equipment and supplies are just not available	75.37 ± 11.3
6	When a manager doesn't arrange for adequate staffing	73.34 ± 11.9
7	Feeling I can't get all of my work done	72.37 ± 13.2
8	When a nursing/medical administrator doesn't really know about what is going on with patients	72.75 ± 11.9
9	Trying to teach patients and families plus getting my other work done	70.73 ± 12.3

10	When a nursing/medical administrator doesn't try to make a problem situation better	71.01 ± 12.3
11	Hospital services are not available around the clock, seven days a week	69.64 ± 11.9
12	When staffing plans are inadequate	70.70 ± 12.2
C	**Kowing what is ahead**	**73.49 ± 1.92**
1	When a new patient is admitted and I think of all that is ahead for him/her	73.13 ± 11.6
2	Working with teenagers who are used to being independent and are becoming more and more dependent	74.47 ± 10.5
3	Seeing parents react to the diagnosis and prognosis	75.84 ± 11.2
4	Working with teenagers who know exactly what is happening to them	73.35 ± 11.4
5	Thinking about all that family members need to know about the disease and its treatment	70.64 ± 11.5
D	**Limitation of Care**	**73.36 ± 2.01**
1	Watching a patient suffer and not be able to do anything about it	76.16 ± 11.1
2	When there is nothing more we can do, to provide comfort for a patient	73.47 ± 11.2
3	When a newly diagnosed patient who is just beginning treatment dies right away	74.13 ± 11.7
4	Knowing a patient has given up	72.73 ± 11.3
5	Watching a family suffer	76.15 ± 12.5
6	When a patient who has been hospitalised a long time dies	73.71 ± 11.5
7	When a favourite patient dies	75.42 ± 11.1
8	Seeing a patient relapse	73.66 ± 13.4
9	Making mistakes	70.32 ± 12.3
10	When patients die at home rather than here at the hospital with us	69.93 ± 12.5
11	Not being certain of what to say to parents of a newly diagnosed child	72.59 ± 11.9
12	Not feeling comfortable with my skills.	72.06 ± 11.9
E	**Emotional Demands**	**70.82 ± 2.52**
1	Working with someone who tries to find something you have done wrong	68.56 ± 13.4
2	Coworker not realising how busy I am and starts making demands on me	72.17 ± 10.9
3	Working with infants who have a very rare form of cancer	73.37 ± 12.6
4	Dealing with parents who have too much hope	74.54 ± 11.3
5	When the child screams when I'm trying to start an I.V	74.06 ± 11.6
6	Dealing with parents who don't trust me	71.22 ± 13.6
7	Using equipment, I'm not familiar with	69.40 ± 13.4
8	Feeling that I've gotten too close to a patient or family	72.19 ± 13.0
9	Feeling dissatisfied with how I personally handle the dying of a special patient	71.86 ± 12.5
10	Trying to meet the needs of both the patient and the family	69.19 ± 12.9

11	Not being certain of what to say to parents of a newly diagnosed child	66.69 ± 15.2
12	When I can't answer a question about my patient	67.21 ± 14.4
13	Not being certain of what to say to parents of a dying child	70.15 ± 14.2
F	**Dying with grace**	**70.69 ± 3.40**
1	Seeing what I believe is going beyond aggressive care for a patient and not letting the patient die	68.28 ± 14.6
2	Having to continue tests on patients who are in terminal care	73.09 ± 10.9

A Univariate Analysis of Socio-Demographics and Perceived Stress Scale (PSS)

A univariate analysis was conducted for the independent variables to find association with PSS. For this purpose, the Pearson correlation was applied to age and PSS and years of experience. The association of more than two categorical variables (age of participant; types of hospitals; specialised area of working; qualification, designation, and years of experience) with a continuous variable (PSS) were assessed by applying one-way ANOVA and independent t test for grouped variables (gender, marital status and specialised training). The statistical values of PSS and independent variables are present in Table 5.

The results showed statical significance in gender (p=0.01) and perceived stress scale score were as age (p=0.51), marital status (p=0.87), different type of hospital categories (p= 0.93), pediatric oncology nurses training (p= 0.81), qualification (p=0.71), designation (p=0.69), specialty area (p= 0.34) and years of experience (p=0.49) were statistically insignificant (Table 6).

Table 6 A Univariate Analysis of the Socio-demographics and Perceived Stress Scale

Variables	Mean ± SD	p-value
[c]**Age (r= 0.06)**	30.78 ± 5.4	0.51
[a]**Gender**		
Male	22.76 ± 3.57	0.01*
Female	20.24 ± 4.94	
[a]**Marital Status**		

Single	21.21 ± 5.29	0.87
Married	21.06 ± 4.13	
[b]**Qualification**		
Diploma	23.50 ± 0.70	0.71
Bachelors	20.52 ± 5.12	
Post RN	21.25 ± 4.44	
Masters	21.90 ± 4.88	
[b]**Designations**		
Bedside nurse	21.35 ± 4.78	0.69
Charge nurse	19.90 ± 4.73	
Nurse Manager	21.66 ± 2.881	
Others	19.83 ± 3.06	
[c]**Total years of experience (r=-0.03)**	8.01 ± 5.12	0.73
[c]**Total years of experience in POU (r= 0.050)**	5.76 ± 3.84	0.61
[a]**Specialized Training**		
Yes	21.04 ± 4.69	0.81
No	21.27 ± 4.62	
[a]**Types of hospitals**		
Private / NGO	21.15 ± 4.65	0.93
Government /Armed Forces	21.07 ± 4.74	
[a]**Specialized area**		
Inpatient / Emergency Room	20.87 ± 4.64	0.33
Outpatient / Daycare	21.85 ± 4.67	

***** p value<0.05

[a] Independent t test

[b] One-way ANOVA

[c] Pearsons correlations

Furthermore, the PSS tool categories were associated with socio-demographic variables. The results showed no statistical significance when compared with the categories of stress (Table 7).

Table 7 Chi Square: The Demographics and PSS

Variables	**n=108 (%)**	**PSS Tool**			
		Low	**Moderate**	**Severe**	**X^2 (p-value)**
Gender					
Male	38 (35.2%)	1 (2.6%)	32 (81.5%)	5 (15.8%)	

Female	70 (64.8%)	8 (11.4%)	54 (77.1%)	8 (11.4%)	2.71 (p=0.25)
Marital Status					
Single	47 (43.5%)	6 (12.8%)	32 (68.1%)	9 (19.1%)	5.61
Married	61 (56.5%)	3 (4.9%)	53 (86.9%)	5 (8.2%)	(p=0.06)
Types of Hospital					
Private	70 (64.8%)	6 (8.6%)	54 (77.1%)	10 (14.3%)	2.29
Government	26 (24.1%)	2 (7.7%)	20 (76.9%)	4 (15.4%)	(p=0.89)
NGO	10 (9.3%)	1 (10%)	9 (90%)	0 (0%)	
Armed Forces	2 (1.9%)	0 (0%)	2 (100%)	0 (0%)	
Education					
Diploma	2 (1.9%)	0 (0%)	2 (100%)	0 (0%)	3.50
Bachelors	34 (31.5%)	5 (14.7%)	25 (73.5%)	4 (11.8%)	(p=0.74)
Post RN	62 (57.4%)	3 (4.8%)	50 (80.6%)	9 (14.5%)	
Masters	10 (9.3%)	1 (10%)	8 (80.0%)	1 (10%)	
Designation					
Bedside Nurse	88 (81.5%)	7 (8.0%)	67 (76.1%)	14 (15.9%)	5.83
Charge nurse	11(10.2%)	2 (18.2%)	9 (81.8%)	0 (0%)	(p=0.44)
Nurse Manager	3 (2.8%)	0 (0%)	3(100%)	0 (0%)	
Others (CNI's, AHN's)	6 (5.6%)	0 (0%)	6 (100%)	0 (0%)	
Specialty Area					
Inpatient	68 (63%)	6 (8.8%)	54 (79.4%)	8 (11.8%)	1.62
Outpatient	4 (3.7%)	0 (0%)	4 (100%)	0 (0%)	(p=0.95)
Daycare	24 (22.2%)	2 (8.3%)	18 (75.0%)	4 (16.7%)	
Emergency Room	12 (11.1%)	1 (8.3%)	9 (75.0%)	2 (16.7%)	

Note. This table highlights the different Chi Square variables in the Demographics and PSS.

A Univariate Analysis of Socio-demographic and Stressor Scale for Pediatric Oncology Nursing (SSPON)

A univariate analysis was conducted for the independent variables to find the association with SSPON. Pearson correlation was applied to SSPON, age and years of experience. The association of more than two categorical variables (age of participant, types of hospitals, specialised area of working, qualification, and designation) with a continuous variable (SSPON) were assessed by applying one-way ANOVA and an independent t test for grouped variables

(gender, marital status and specialised training). The statistical values of SSPON and independent variables are present in Table 6.

The results showed statistical significance between gender (p=0.05), the specialty area of working (p=0.04) and types of hospital (p=0.04) were as age (p=0.75), marital status (p=0.51), qualification (p=0.20), designation (p=0.42), total years of experience (p=0.60), and nurses receiving pediatric oncology training were not statistically significant with the aggregated means for SSPON (Table 8).

Table 8 *The Association between Socio-demographics Variable and SSPON*

Variables	Mean ± SD	p-value
[c]**Age (r= -0.04)**	30.78 ± 5.4	0.75
[a]**Gender**		
Male	70.07 ± 3.10	**0.05***
Female	72.08 ± 2.33	
[a]**Marital Status**		
Single	72.03 ± 2.19	0.51
Married	71.56 ± 2.83	
[b]**Qualification**		
Diploma	--	0.20
Bachelors	71.52 ± 2.58	
Post RN	72.20 ± 2.35	
Masters	69.60 ± 3.35	
[b]**Designations**		
Bedside nurse	71.98 ± 2.48	0.42
Charge nurse	71.05 ± 2.84	
Nurse Manager	68.15	
Others	72. 19	
[c]**Total years of experience (r=-0.07)**	8.01 ± 5.12	0.60
[c]**Total years of experience in POU (r=0.05)**	5.76 ± 3.84	0.68
[a]**Specialised Training**		
Yes	71.50 ± 2.83	0.52
No	71.98 ± 2.33	
[a]**Types of hospitals**		
Private/NGO	70.99 ± 2.48	**0.04***
Government/Armed Forces	72.43 ± 2.40	
[a]**Specialised area**		
Inpatient /Emergency Room	72.15 ± 2.41	**0.04***

Outpatient/Daycare	70.40 ± 2.56

***** p value<0.05

[a] Independent t test

[b] One-way ANOVA

[c] Pearsons correlations

The Summary

The study results of the perceived stress scale and the stressor scale for pediatric oncology nursing were discussed in this chapter. Moreover, the study results discussed the associations of socio-demographic variables with perceived stress scale and stressor scale for pediatric oncology nursing. Overall, a statistical significance was observed in gender with PSS, whereas a statistical significance was observed in gender, types of hospitals and specialty area of nurses practising pediatric oncology nursing with SSPON.

Chapter Five: Discussion

This chapter presents the discussion of the study findings in the light of the literature support. The first half of the chapter describes the stress and stressors for pediatric oncology nurses. Further, the chapter discusses about the association of stress and stressors in pediatric oncology nurses with socio-demographic characteristics. In the end, the study strengths and limitations are enlisted, followed by recommendations at organisational, personal and research levels.

The Perceived Stress Scale Among Pediatric Oncology Nurses

The purpose of the study was to assess the perceived stress score among pediatric oncology nurses in Pakistan. The study highlighted that the majority of the nurses working in pediatric oncology units have moderate to severe stress levels. Moreover, the univariate analysis of the independent variables showed that the perceived stress scale score was significantly associated with gender.

Furthermore, the average mean score of PSS suggested that the pediatric oncology nurses were suffering from a moderate level of stress, this finding from the present study is congruent with the findings of other studies in the literature. Likewise, the findings from the current study is consistent with the results of the other study conducted by (Jane M Murphy et al., 2021) which also reported the presence of moderate levels of stress among association of Pediatric Hematology Oncology Nurse (APHON).

Likewise, a similar finding was obtained from another study conducted by Lioka et al. (2022) that revealed that pediatric oncology nurses had a higher score of stress as compared to pediatric nurses. Another study used the nursing stress scale as its tool and discovered that pediatric oncology nurses have moderate levels of stress (Ko, 2016).

On the contrary, a study conducted in the Northeastern United States showed a significant contrast between new graduate and more experienced nurses' stress levels based on total their stress scores. It showed that new graduate nurses reported notably higher stress levels, particularly in relation to death and dying (mean = 16.45, SD = 3.37), and significant differences were observed among the three groups (Mazzella-Ebstein et al., 2021).

Additionally, another study found that higher stress scores in oncology nursing staff were associated with being older than 40 years, working as outpatient RNs, holding advanced degrees, and having over 15 years of oncology work experience. Among the five demographic characteristics considered, individuals with higher mean stress scores fell in the age range of 41–50 years, were married, held RN positions with associate degrees in nursing, and possessed 11–15 years of overall nursing experience, with the same duration in oncology. Notably, variables such as marital status, education level, and work experience in oncology units did not exhibit significant differences in stress levels (Ko, 2016).

In conjunction with the above findings, another study conducted in a specialized cancer hospitals known as 57357 hospitals in Cairo, Egypt, revealed that there exists a highly statistically significant correlation between the post-programme stress index of the nursing staff under study and their years of professional experience. Furthermore, statistically significant associations were observed in relation to their qualifications and health status, on the other hand, no significant correlations were found with factors such as gender and age (Abdel Sabour, 2023).

The reason behind the limited body of literature on the stress experienced by pediatric oncology nurses could be due to the various factors that are worth considering. One prominent factor could be the influence of the cultural context. This means that the perception of stress and its impact on healthcare professionals can vary significantly across different cultural settings.

Hence, a particular situation might be deemed as stressful in one cultural context could be viewed differently in another. This cultural variation can influence how stress is assessed and reported, thus contributing to the disparities in the literature.

Moreover, the utilisation of different tools and scales to assess stress could be a key contributor to the divergence in findings. The lack of standardised instruments customised for this particular context can lead to fluctuations in how stress is gauged and, in turn, how it is documented. Thus, various assessment tools may not effectively capture the distinctive stressors encountered by pediatric oncology nurses.

A noteworthy point of consideration could be the contrast between high-income countries (HIC) and low- and middle-income countries (LMIC) in terms of the available resources to deal with pediatric cancer. Pediatric oncology units in HICs often have more abundant resources, which can lead to differences in work conditions and, subsequently decrease in stress levels. On the other hand, nurses in LMICs may encounter additional stressors related to limited resources, higher patient-to-nurse ratios, and inadequate training and support systems. Hence, these contextual distinctions can undoubtedly influence stress levels and potentially explain the discrepancies in the literature.

Educational levels and training might be other factors that can account for variations in stress experiences. The level of education and the depth of training can vary among pediatric oncology nurses. This disparity may lead to different perceptions of stress and distinct coping mechanisms. Hence, a nuanced understanding of stress and its management, stemming from varying levels of training and educational backgrounds, can contribute to differences in reported stress levels.

In essence, the multitude of factors outlined above highlights the complexity of studying stress in the pediatric oncology nursing profession. The interaction among cultural context, varying perceptions of stress, diverse assessment tools, resource discrepancies between LMICs and HICs, and the impact of education and training requires a more refined and context-specific approach to examine and address stress in this specialised field.

Socio-Demographic Characteristics Association Pediatric Oncology Nurses to Assess Stress

According to the result of the presenting study, there was a significant statistical association between gender and PSS, as was identified in the study. Thus, the following result is aligned with other studies stating that a correlation exists between gender and stress where female nurses tend to demonstrate elevated stress levels (d'Ettorre et al., 2019).

Moreover, the significant association between gender and the Perceived Stress Scale (PSS) among pediatric oncology nurses might be attributed to several factors. For instance, gender-specific coping strategies, variations in workload distribution, emotional resilience, societal expectations, and the available support systems can all contribute to differences in how male and female nurses perceive and manage stress. Furthermore, the requirement of unique and emotional kind of caregiving demands on pediatric oncology nursing may also influence this association. Thus, recognising and addressing these gender-related disparities in stress levels is essential for the development of effective interventions and support systems that cater to the distinct needs of nurses of both genders in this challenging healthcare environment.

Furthermore, regarding the stress and gender variable, a study conducted in a pediatric public hospital in Greece did not report any association of the level of stress with gender (Lioka et al., 2022). In contrast, another study conducted in Nigeria, which measured work stress,

concluded that gender had a significant correlation with work-related stress (Ezenwaji et al., 2019).

Next, the findings of the present study reveal an intriguing observation that warrants further examination. It was observed that various demographic characteristics, including age, marital status, qualification, designation, years of experience, specialised training, types of hospital, and speciality areas, did not display statistically significant associations with Perceived Stress Scale (PSS) scores among pediatric oncology nurses. This observation suggests that PSS scores do not significantly differ among nurses in this context based on their demographic attributes. However, this absence of statistical significance may be influenced by several factors that necessitate a more in-depth analysis.

Firstly, the sample size utilised in this study may have been insufficient to detect subtle associations. A larger and more diverse sample could potentially provide greater statistical power to unveil associations that might have remained undetectable within the current dataset.

Secondly, the statistical methods employed in this study, including ANOVA, Pearson and t-tests, were thoughtfully selected to investigate the connections between demographic variables and PSS scores. Thus, despite the rigour of these statistical techniques, the analysis did not reveal statistically significant associations. It is thus essential to recognise that the intricate nature of stress within healthcare settings may necessitate more refined measurement tools or alternative statistical approaches to capture the underlying determinants effectively.

Furthermore, it is essential to recognise the inherent variability in perceived stress among pediatric oncology nurses. Additionally, stress levels can be influenced by a multitude of personal and professional factors, and the variables examined in this study may not encapsulate

the complete spectrum of factors at play. It is worth noting other unexamined variables may exist that could hold greater relevance for understanding stress among pediatric oncology nurses. For example, factors such as the work environment, patient caseload, or specific job responsibilities might play a more substantial role in influencing stress levels.

Lastly, the cross-sectional nature of this study, which captured a single point in time, may not fully represent the dynamic nature of stress experienced by pediatric oncology nurses. Thus, conducting longitudinal studies to track stress levels over time could provide a more comprehensive understanding of how these demographic variables evolve in relation to PSS scores.

Additionally, it's important to consider the influence of resource constraints and the limited availability of specialised training or education designed to address the unique challenges of pediatric oncology nursing. Moreover, these factors may have contributed to a more uniform distribution of stress levels among nurses, thus potentially reducing the impact of demographic variables. In essence, the similarity in stress levels could be a result of a shared experience among nurses working in an exceptionally demanding and emotionally charged field.

Nonetheless, it is crucial to acknowledge that while this study did not identify demographic associations with stress, unexplored factors and stressors, unique to each nurse's individual journey, may yet exist. Thus, subsequent research endeavours can undertake a more profound exploration of the intricate aspects of culture, contextual disparities, resource limitations, and the imperative for specialised education to attain a more comprehensive comprehension of the multifaceted stress landscape in this distinct nursing milieu.

In our study, it was found that only factors like age and nursing experience significantly influenced work-related stress scores among the participants. These factors were observed to have a notable impact. However, it's important to note that in a separate study conducted by Ko (2016), different demographic attributes were found to not exhibit significant disparities in stress levels. Specifically, factors such as marital status, educational attainment, and the duration of experience in oncology nursing did not show significant variations in stress levels, as reported by (Ko, 2016). Meanwhile, in another study, the variable age showed no significant correlation with stress scores, while marital status and the number of children were associated with specific Nursing Stress Scale (NSS) factors. Moreover, educational level did not significantly affect self-reported stress, and prior nursing experience did not impact the overall stress score. Interestingly, having previous experience in pediatric oncology nursing was linked to lower stress levels across the NSS components (Lioka et al., 2022). On the other hand, another study that identified factors like marital status, workload, and professional conflicts as noteworthy stressors among nurses (Okuhara et al., 2021). Likewise, Maria Zarenti et al. (2021) shared the findings that stress levels were found to be influenced by variations in nursing expertise and educational attainment in a systemic review. Similarly, in another study conducted in Nigeria, the findings showed that variables like age, the workplace setting, and years of professional experience did not significantly contribute to the anticipation of work-induced stress in the nursing cohort (Ezenwaji et al., 2019).

Pediatric Oncology Nurses Stressor Levels Calculated through using SSPON Tool

The stressors were assessed using the stressor scale for pediatric oncology nurses (SSPON). The assessment of stressor levels using the SSPON tool is viewed through Neuman's Systems Model, highlighting the interconnectedness of stressors within the nursing environment,

including factors such as colleagues, patient care, and emotional distress. The subscale; knowing what is ahead had the greatest mean, followed by the 'limitation to care and system demands', which out of the six subscales emerged as the lowest mean subscale was co-workers. Moreover, the three items with the highest mean were as follows: 'working with someone I don't think is competent' (4), followed by 'watching a patient suffer' (8) and 'not be able to do anything about it', and also 'watching a family suffer' (20). Next, the three items with the lowest mean were when 'other professionals do more than they are qualified to do' (22), followed by 'not being certain of what to say to parents of a newly diagnosed child' (44), and lastly, 'co-worker calls in sick when I know that is not true' (2). On the contrary, the item with the highest median score revolved around the emotional distress experienced when 'a favourite patient passes away', while the lowest median score was linked to the 'emotional burden of patients dying at home rather than within the hospital'. Additionally, items with elevated ratings included the 'emotional strain associated with making mistakes', 'the frustration stemming from managerial failure to organise adequate staffing', and the ethical dilemma of what was perceived as 'excessive care for a patient', and 'delaying the natural course of their passing'. On the other hand, items with low median scores were 'when the child screams when I am starting an IV', followed by thinking about 'all that family members need to know about the disease and it's treatment', and 'when a patient who has been hospitalised for a long time dies' (Pamela S Hinds et al., 1990).

According to other researches, the situations that induced the highest levels of stress among nurses were predominantly associated with pediatric cases, particularly situations involving 'Dealing with a lot of deaths in a short space of time', as indicated in the research conducted by Slater and Edwards (2018). Moreover, these findings align with the seminal study by Pamela S Hinds et al. (1998), who employed the Stressor Scale for Pediatric Oncology Nurses

(SSPON; Hinds et al., 1990) to delineate the Stress Response Sequence within a specialist nursing cohort (N=126). Resultantly, their investigation disclosed that pediatric haematology/oncology nurses in the sample experienced moderate-intensity stress, with the primary stressors being related to colleagues ('incompetent', 'insensitive', and lacking initiative'). Subsequently, the stress was also linked to situations where nurses perceived that a child was not receiving compassionate end-of-life care (Pamela S Hinds et al., 1998) In another study, the participants identified the relapse or sudden death of a beloved patient as the most significant stressor. Moreover, the second most prevalent source of stress was an overwhelming amount of workload that hindered the provision of high-quality patient care using the Pediatric Oncology Nurse Stressor Questionnaire [PONSQ] (Evans-Emery, 1993).

On the other hand, a systemic review article recognised organisational issues, interaction with families and coping with illness and death emerged as the most stressful factors (Maria Zarenti et al., 2021). Meanwhile, another systemic review stated that organisational factors do have an impact, and the primary stressors within this group of nurses are associated with the inherent aspects of their work, such as establishing close and enduring relationships with patients, delivering care to critically ill children, and coping with the loss of a child suffering from cancer (Macintyre et al., 2022). Likewise, in a qualitative study, work-related stressors were one of the emerging themes which included the following subcategories of workload and staff shortage, emotional demands, lack of social support, language barriers, and lack of respect from patients and family members, and the cultural differences (Dhuha Youssef Wazqar, 2019).

Moreover, the variation in stressors experienced by pediatric oncology nurses could be attributed to several factors, including differences in cultural context, the availability of resources, and individual perceptions of stressors. Furthermore, cultural context plays a pivotal

role in shaping the values, norms, and coping mechanisms of healthcare professionals. Thus, what may be considered a significant stressor in one cultural context might be managed differently in another one.

Relating the variations in stressors experienced by pediatric oncology nurses to Neuman's model underscores how cultural context, resource availability, and individual perceptions contribute to the dynamic nature of stress, aligning with the model's emphasis on the interrelatedness of individuals and their environment.

Moreover, the availability of resources, both in terms of staffing and medical supplies, can significantly impact the stress levels of nurses. In settings with limited resources, nurses may face additional challenges in providing care, leading to heightened stress. Finally, individual perceptions of stressors can vary widely, as not all nurses will respond to the same situations in the same way. Some may find solace in their ability to form close relationships with patients, while others may be deeply affected by the loss of a child under their care. Conclusively, understanding these nuanced differences in stressors is essential for developing tailored interventions and support systems for pediatric oncology nurses in diverse healthcare settings.

Socio-Demographic Characteristics Association Pediatric Oncology Nurses to Assess Stressors:

The study's results indicated that stressors (SSPON) exhibited statistical significance in relation to gender, different types of hospitals, and specialized areas. However, other demographic factors, including age, marital status, education, qualification, designation, work experience, and specialized training in pediatric oncology, did not show statistical significance

Recognizing the significance of stressors through Neuman's lens underscores the model's focus on the dynamic interactions between demographic factors and the unique stressors encountered by pediatric oncology nurses, contributing to a comprehensive understanding of stress in this specialized field.

Moreover, according to a cross-sectional study conducted in Greece, age did not exhibit a significant association with stress scores, except for the subscale concerning treatment uncertainty, where younger nurses reported higher stress levels compared to their older counterparts. Furthermore, marital status and the number of children were significantly linked to specific Nursing Stress Scale (NSS) factor scores. Specifically, participants with two or more children experienced lower stress levels in factors related to conflicts with medical staff ($p = 0.019$) and workload ($p = 0.035$). In addition, regarding prior work experience, there was no statistically significant impact on individual NSS subscales and factors. However, for treatment uncertainty and the psychological environment, the participants with over 15 years of experience showed lower stress levels. Notably, in the overall NSS score and its individual subscales and factors, increasing previous work experience was associated with reduced stress levels. Hence, these findings suggest that certain demographic and experiential factors may influence the stress experiences of pediatric oncology nurses (Lioka et al., 2022).

Firstly, the incongruence between the stressors identified in this study and the prevailing literature may be attributed to various contextual factors. Firstly, cultural perceptions and attitudes towards pediatric oncology care could significantly influence the nature and intensity of stressors experienced by nurses. In different cultural contexts, the emotional and psychological burden of caring for terminally ill children may be perceived and managed differently, thus impacting the stressors that emerge as most salient.

Secondly, the type of healthcare institution, whether government-funded or private, could introduce variations in the work environment, patient demographics, and available resources. Moreover, pediatric oncology nurses working in government hospitals may face distinct challenges compared to those in private healthcare settings, resulting in differences in the stressors they encounter.

Furthermore, the diversity of specialty areas within pediatric oncology care, such as haematological malignancies or solid tumours, can also contribute to variations in the stressors experienced. Thus, each speciality may present unique caregiving demands and emotional stressors, further emphasising the need for targeted interventions.

Moreover, Safe nursing staffing levels in pediatric oncology are paramount for mitigating stressors and preventing high levels of stress among healthcare providers. In the context of the International Council of Nursing, particularly in Low- and Middle-Income Countries (LMIC), maintaining appropriate staffing levels becomes even more crucial. Adequate staffing not only ensures the delivery of quality care to pediatric oncology patients but also safeguards the well-being of nurses by preventing burnout and fatigue. The International Council of Nursing emphasizes the need for standardized staffing norms, especially in LMICs, to create a conducive work environment that supports healthcare professionals in managing the unique challenges associated with pediatric oncology. Addressing staffing concerns is pivotal for enhancing the resilience of healthcare systems and improving outcomes for both patients and caregivers.

Lastly, variances in the training and support systems available to nurses for stress management could also play a pivotal role. For instance, nurses in different settings may receive varying levels of training and resources to cope with stressors, which can affect their ability to navigate the challenges inherent to pediatric oncology nursing.

To conclude, recognising these contextual differences is essential for developing tailored interventions that address the specific stressors faced by pediatric oncology nurses in a comprehensive and effective manner. Hence, this understanding can lead to better support and improved well-being for nurses working in this emotionally demanding field.

The Strengths of the Study

The current study has the following strengths:

- The extent of the information that is available to the researcher, the current study has not been conducted yet in the context of Pakistan to assess the level of stress and stressors among pediatric oncology nurses. Thus, the following study has created baseline data regarding the level of stress and stressors of pediatric oncology nurses in Pakistan.
- The two different tools applied in the study were validated in various different countries among the same population of pediatric oncology nurses.
- There was a diverse group of nurses from all across Pakistan and different types of hospitals, enhancing the generalisability of your findings to a broader population of nurses in similar settings.
- The study addresses an important and often understudied issue, which is the stress experienced by pediatric oncology nurses. The findings have practical implications for improving the well-being and care quality for both nurses and patients.
- Utilising Neuman's Systems Model as a theoretical framework strengthens your study by providing a holistic perspective on stress among pediatric oncology nurses. This well-established model guides the examination of adaptation to

stressors and individual responses, offering valuable insights for interventions, practice, and policy development. Its interdisciplinary relevance enhances the applicability of the findings beyond nursing.

The Limitations of the Study

The current study limitations are as follows:

- The use of self-report measures, such as the Perceived Stress Scale (PSS) and Stressor Scale for Pediatric Oncology Nurses (SSPON), is subject to response bias and may not fully capture the complexity of the stress experienced by nurses.
- The respondents may have provided socially desirable answers, potentially underreporting their actual stress levels or stressors due to fear of negative consequences.
- While the response rate is relatively high, there may still be a potential for response bias, as nurses who chose to participate may have different stress levels or characteristics compared to those who did not participate.
- The study focused on identifying stress levels and stressors but did not explore coping strategies employed by pediatric oncology nurses which could be valuable in developing interventions.

The Recommendations

The finding of the current study generated recommendations at organisational, personal and research levels.

Organisation Level

Following are the recommendations for improving the level of stress and coping with stressors at the organisational level.

- The Organizations should implement and adhere to the International Council of Nursing's guidelines on safe staffing levels for pediatric oncology nursing in Low- and Middle-Income Countries (LMIC), ensuring an appropriate nurse-to-patient ratio to mitigate stress and enhance patient care.
- Organizations should also establish a robust nursing management system that provides consistent support, mentorship, and resources to pediatric oncology nurses, fostering a positive work environment and addressing stressors effectively.

- In order to reduce stress among the hospitals, healthcare organisations should establish and promote support programmes, such as employee assistance programmes (EAPs) and counseling services, to assist pediatric oncology nurses in establishing effective coping mechanisms.
- Incorporate stress management and resilience training programmes into the regular training curriculum for nurses working in pediatric oncology units. These programmes should focus on coping strategies, emotional support, and self-care to reduce the level of stress and stressors in response to the disease process of the patients and working in resource-limited settings. Moreover, organisations should also provide cultural sensitivity training to help healthcare professionals understand how the cultural context can influence the perceptions of stress. Additionally, this training can promote empathy and better communication with patients and colleagues from diverse backgrounds.
- Regular health check-ups and routine mental health assessments should be integrated into the nursing practice. These assessments aim to identify early signs of

stress and provide timely interventions. Thus, by conducting these assessments, healthcare institutions can proactively address nurses' well-being, safeguard their physical and mental health, and prevent burnout.

- Strategies like nurturing open communication, providing peer support, and allowing nurses to discuss stress-related concerns without fear of judgment can be implemented in hospitals. These strategies will, in turn, create an environment of trust and collaboration, thus aiding nurses in managing stress effectively in their demanding roles.

Personal Level

Following are the recommendations for improving the level of stress and coping with stressors at a personal level:

- Nurses need to be sensitised about mental health in relation to stress and stressors. They should be encouraged to seek support when dealing with stress from colleagues, supervisors, or professional counsellors. Thus, sharing experiences and emotions can provide them the required relief and guidance.

- For developing and utilising effective coping mechanisms for stress, nurses need to be educated about various techniques that include mindfulness, relaxation exercises, and time management strategies. These strategies have proven to be effective in reducing stress; thus, nurses should be encouraged to use them frequently.

Research Level

The study has generated a few recommendations for the future researches.

- Qualitative research can be conducted to explore nurses' personal experiences and narratives, such as in-depth interviews or focus groups. This can offer a deeper understanding of the emotional and psychological aspects of stress and stressors.
- A study of a higher magnitude, with a larger sample size, can be conducted to enhance the statistical power and generalisability of findings. This can provide more robust insights into the stress experiences of pediatric oncology nurses and help in identifying significant factors contributing to their stress levels.
- A mixed-method research that involves a comprehensive analysis of how male and female nurses perceive, cope with, and respond to stressors inherent in their profession can also be conducted. Moreover, understanding gender-related differences in stress experiences and responses can lead to tailored interventions and support systems that acknowledge and address the distinct needs of nurses of both genders within the pediatric oncology nursing field. Such a research endeavour can provide insights into gender-specific coping strategies, workload distribution, emotional resilience, societal expectations, and available support systems that influence stress levels among nurses. Thus, by exploring these factors indepth, this research can contribute to a more precise understanding of how to mitigate stress effectively and enhance the well-being of pediatric oncology nurses.

- A research can be done to compare the stress levels of pediatric oncology nurses with nurses in other specialities or healthcare professionals working in similar high-stress environments. This comparative research can help identify unique stressors in pediatric oncology nursing.

- Another research can investigate how cultural and societal factors unique to Pakistan influence the stress levels of pediatric oncology nurses. Thus, this research can provide insights into culturally sensitive interventions.
- Conducting longitudinal studies to track stress levels over time could provide a more comprehensive understanding of how these demographic variables evolve in relation to PSS scores.

Conclusion

The study assessed the perceived stress scale and stressors among pediatric oncology nurses working in pediatric oncology units across Pakistan. The findings of the study revealed that there is moderate to severe stress among the nurses working in pediatric oncology, whereas the common stressors were knowing what was ahead, followed by the limitation to care. Furthermore, there was a significant association of gender with stress scores. Moreover, gender, different types of hospitals (private, government) and speciality areas (inpatient, outpatient) had a significant association with the stressors scale for pediatric oncology nurses. Conclusively, the study highlights the essential recommendations at organisational and personal levels, along with the need for further research to uncover the grey areas, to reduce the stress and find measures to overcome stressors.

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Appendix A Permission letter from Chief Medical Officer

آغا خان یونیورسٹی
THE AGA KHAN UNIVERSITY

Dated: April 20, 2023

Title: Assessing the prevalence of Stress and its predictors among pediatric oncology nurses working in pediatric oncology units across Pakistan - A Cross-Sectional Analytical Study

Principal Investigator: Dr Laila Ladak
Associate Professor, School of Nursing
Aga Khan Hospital
Karachi

The above-entitled study is a analytical cross sectional study in the Aga Khan University Hospital, Karachi.

As Chief Medical Officer at the Aga Khan University Hospital, Karachi, I approve the above named study to be conducted within the Hospital, following required approvals and maintaining compliance with all Institutional ethical and regulatory requirements

Asim F. Belgaumi,
Professor, Pediatric Hematology & Oncology,
Department of Oncology,
Chief Medical Officer,
Associate Dean for Clinical Affairs
Aga Khan University Hospital.

Appendix B Permission letter from Chief Nursing Officer

آغا خان یونیورسٹی ہسپتال، کراچی
The Aga Khan University Hospital, Karachi

Stadium Road, P.O. Box 3500, Karachi 74800, Pakistan
Tel: +92 21 3493 0051
Fax: +92 21 3493 4294, 3493 2095
www.aku.edu

Dated : March 09, 2023

Title : "Assessing the prevalence of Stress and its predictors among pediatric oncology nurses working in pediatric oncology units across Pakistan - A Cross-Sectional Analytical Study"

Dr. Laila Ladak
Assistant Dean, Graduate Program
AKUSONAM

As Chief Nursing Officer at the Aga Khan University Hospital, Karachi, I approve the above named study to be conducted within the Hospital, following required approvals and maintaining compliance with all Institutional ethical and regulatory requirements.

Khairunnissa Hooda
Chief Nursing Officer, Nursing Services
Aga Khan University Hospitals

Appendix C Permission letter from Ethical Review Committee

آغا خان یونیورسٹی
THE AGA KHAN UNIVERSITY

12-Jun-2023

Dr. LAILA LADAK
Department of School of Nursing and Midwifery
Aga Khan University
Karachi

Dear Dr. LAILA LADAK,

2023-8529-25279, LAILA LADAK: Assessing the prevalence of Stress and its predictors among pediatric oncology nurses working in pediatric oncology units across Pakistan - A Cross-Sectional Analytical Study

Thank you for submitting your application for ethical approval regarding the above mentioned study.

Your study was reviewed and discussed in ERC meeting. There were no major ethical issues. The study was given an approval for a period of one year with effect from 12-Jun-2023. For further extension a request must be submitted along with the annual report.

List of document(s) approved with this submission.

Submission Document Name	Submission Document Date	Submission Document Version
SSPON Peds Onc Nurse Stress Scale (PH) JAN 3 2023	03-Jan-2023	1
Demographic Data	28-Feb-2023	1
CITI_Laila Ladak	15-Jan-2021	1
Sadaf- CITI Updated	15-Mar-2022	1
citiCompletionCertificate_shenila anwarali	26-May-2022	1
Docs_Percieved Stress Scale	06-Mar-2023	1
CITI_HSP_Certificate_-_Dr Asim	15-Mar-2022	1
Permission letter CNO	09-Mar-2023	1
Permission letter from PSPO	28-Mar-2023	1
Informed Consent form Shenila	19-Apr-2023	2
citiCompletionCertificate Dr Adeel Khoja updated.	19-Apr-2026	2
Permission letter CMO updated	20-Apr-2023	2
Study Protocol SSPON Shenila- final (1)	17-May-2023	2
request for permission letter from participating hospitals	01-Jun-2023	1

Any changes in the protocol or extension in the period of study should be notified to the Committee for prior approval. All informed consents should be retained for future reference.

Please ensure that all the national and institutional requirements are met.

Thank you.

Sincerely,

Appendix D Permission Letter from PSPO

Pakistan Society of Pediatric Oncology

Date: 24th Mar 2023

Dear Shenila Anwar Ali,

Subject: Permission letter from PSPO for assistance with questionnaire dissemination for the Thesis

Dear Ms. Anwar,

Pakistan Society of Pediatric Oncology (PSPO) is accepting your request to use PSPO platform for the dissemination of information related your thesis titled as "Prevalence of Stress and its predictors among pediatric oncology nurses working in pediatric oncology units Pakistan - An Analytical Cross-Sectional Study" for your Masters in Science of Nursing program Thesis.

Regards

Dr. Asim Belguami
President
Pakistan Society of Pediatric Oncology

Office No. 115, First Floor, Park Avenue Building on Plot No. 24-A Block-6 P.E.C.H. Society,
Main Shahrah-e-Faisal Karachi.

Appendix E Informed Consent

Study Title: Assessing the prevalence of Stressors among pediatric oncology nurses working in pediatric oncology units across Pakistan - A Cross-Sectional Analytical Study

Thesis committee: Supervisor and Committee members

Supervisor	Dr. Laila Ladak Assistant Dean, Graduate program AKU-SONAM Laila.ladak@aku.edu
Committee Member:	Dr. Sadaf Altaf Lecturer, Pediatric Oncology Aga Khan University Hospital, Karachi Sadaf.altaf@aku.edu
Committee Member:	Dr Asim Belgaumi Chief Medical Officer, Pediatric Oncologist Aga Khan University Hospital, Karachi asim.belgaumi@aku.edu
Committee Member:	Dr Adeel Khoja Statistician, Adelaide University, Australia Adeel.khoja@adelaide.edu.au

Introduction:

I am Shenila Anwarali, doing a Master of Science in Nursing from Aga Khan University, School of Nursing and Midwifery (SONAM). I am doing research study titled "Assessing the prevalence of Stressors among pediatric oncology nurses working in pediatric oncology units across Pakistan - A Cross-Sectional Analytical Study" for MScn thesis. I want to invite you to join in this study and fill out the survey. The study will be supervised by Dr. Laila Ladak.

Purpose of the Study:

This purpose of this study is to measure stress commonly encountered by pediatric oncology nurses using a Stressor Scale for Pediatric Oncology Nurses and identify its predictors across Pakistan.

Procedure:

If you agree to take part in this research study, you will be requested to fill a demographic questionnaire such as age, gender, years of experience, type and name of hospital. Than you will be able to see the questionnaire which comprises of different questions to assess the stressor of pediatric oncology nurses and then you will be requested to place yourself on the likert scale (0 being not at all stressful and 100 being as stressful as it can be). This will take approximately 10-15 minutes of your time to fill out the questionnaire.

Possible Risk/Discomfort:

There are no anticipated risks associated with taking part in this research project, but you are free to decline participation if you feel uncomfortable or at risk, and you can stop at any time.

Benefits of being in the study:

Your participation in this study does not guarantee that you will get any benefit from it. However, it is our aim that your involvement in this study will contribute to assessing the stressful factors for pediatric oncology nurses and further imitating steps to overcome the stressor in a culturally acceptable manner.

Confidentiality:

The study's confidentiality and anonymity will be upheld at all times during the research process. The participants in this study will not be identified by name. Throughout data collection, analysis, and publication, your name and identify will be kept private. All electronic data will be encrypted and guarded using a password-protected file. In any report or publication, I won't include any details that could be used to identify someone. However, the entire data will be accessible to thesis committee without personal identification.

Payments/Reimbursement:

This research project is free of charge and participation is entirely voluntary; as such, you will not be paid, reimbursed financially, or otherwise compensated.

Right to refuse or withdraw:

You have the option of participating in or not participating in this study. There will be no fine or loss of benefits to which you would otherwise be entitled if you decide not to participate. If you decide to stop taking part in the study, please let me know by your name, phone number so that your participation can be cancelled.

Contact Information/Report Concerns:

If you have any questions concerning your involvement in the study or if you have any issues about your rights as a research subject, please don't hesitate to get in touch with the information listed below.

Principal Investigator: Ms. Shenila Anwarali

Phone Number: 03322518391

E-mail: shenila.anwarali2@scholar.aku.edu

Research supervisor

Dr. Laila Ladak

Contact no: 92 21 34865448

Email: laila.ladak@aku.edu

Statement of consent:

☐ The consent form has been read and I understand it. I have received complete disclosure of all information pertaining to my involvement in the research project. I willingly accept to participate in this investigation.

Date: 4 March 2024

Investigator Name: Shenila Anwarali

Signature: 

Date: 4 March 2024

Appendix F Demographic Question

What is you age (years)?

Identify your gender.

- Male
- Female

Where do you live? (CITY)

What is your martial status?

- Single
- Married
- Divorced
- Widow

Please mention the name of hospital you are currently working in.

What is the type of hospital that you are currently working in?

- Private
- Government
- Semi government
- NGO based
- Armed Forces

Which type of health care center does your hospital fall under?

- Primary
- Secondary
- Tertiary

What is the highest level of you qualification ?

- Diploma
- Bachelors
- Post RN
- Masters
- Phd

What is your current designation at work?

- Bedside Nurse
- Charge Nurse
- Nurse Manager
- Other

What is you area of specialty of working in Pediatric Oncology

- Inpatient / Wards
- Outpatient/ Clinics
- Daycare
- Emergency Room

Please mention the years of experience working as a nurse (including working in Pediatric Oncology)

Please mention years of experience specifically working in Pediatric Oncology

Have you received any specialized training in the field of Pediatric Oncology

- Yes
- No

Appendix G: Perceived Stress Scale (PSS)

Perceived Stress Scale

A more precise measure of personal stress can be determined by using a variety of instruments that have been designed to help measure individual stress levels. The first of these is called the **Perceived Stress Scale**.

The Perceived Stress Scale (PSS) is a classic stress assessment instrument. The tool, while originally developed in 1983, remains a popular choice for helping us understand how different situations affect our feelings and our perceived stress. The questions in this scale ask about your feelings and thoughts during the last month. In each case, you will be asked to indicate how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer fairly quickly. That is, don't try to count up the number of times you felt a particular way; rather indicate the alternative that seems like a reasonable estimate.

For each question choose from the following alternatives:
0 - never 1 - almost never 2 - sometimes 3 - fairly often 4 - very often

_____ l. In the last month, how often have you been upset because of something that happened unexpectedly?

_____ 2. In the last month, how often have you felt that you were unable to control the important things in your life?

_____ 3. In the last month, how often have you felt nervous and stressed?

_____ 4. In the last month, how often have you felt confident about your ability to handle your personal problems?

_____ 5. In the last month, how often have you felt that things were going your way?

_____ 6. In the last month, how often have you found that you could not cope with all the things that you had to do?

_____ 7. In the last month, how often have you been able to control irritations in your life?

_____ 8. In the last month, how often have you felt that you were on top of things?

_____ 9. In the last month, how often have you been angered because of things that happened that were outside of your control?

_____ 10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

Figuring Your PSS Score

You can determine your PSS score by following these directions:

- First, reverse your scores for questions 4, 5, 7, and 8. On these 4 questions, change the scores like this:

  0 = 4, 1 = 3, 2 = 2, 3 = 1, 4 = 0.

- Now add up your scores for each item to get a total. **My total score is** _____.

- Individual scores on the PSS can range from 0 to 40 with higher scores indicating higher perceived stress.
  - ► Scores ranging from 0-13 would be considered low stress.
  - ► Scores ranging from 14-26 would be considered moderate stress.
  - ► Scores ranging from 27-40 would be considered high perceived stress.

The Perceived Stress Scale is interesting and important because your perception of what is happening in your life is most important. Consider the idea that two individuals could have the exact same events and experiences in their lives for the past month. Depending on their perception, total score could put one of those individuals in the low stress category and the total score could put the second person in the high stress category.

***Disclaimer**: The scores on the following self-assessment do not reflect any particular diagnosis or course of treatment. They are meant as a tool to help assess your level of stress. If you have any further concerns about your current well being, you may contact EAP and talk confidentially to one of our specialists.*

State of New Hampshire
Employee Assistance Program

Appendix H: Stress Scale for Pediatric Oncology Nurses (SSPON)

The Stressor Scale for Pediatric Oncology Nurses (SSPON)

Purpose of the SSPON

The intent of the SSPON is do measure role-related stress in pediatric oncology nurses who have been in the specialty for at least six months.

Scoring the SSPON

Scoring the SSPON is summative with higher scores indicating higher role-related stress. Six subscales comprise the SSPON.

Subscales	Items
1.Co-worker:	1, 4, 6, 7, 10, 22
2. System Demands:	2, 5, 17, 29, 31, 33, 35, 40, 43, 48, 49, 50
3. Knowing what is ahead:	12, 15, 19, 25, 28
4. Limitations of care:	8, 11, 14, 16, 20, 21, 24, 26, 34, 37, 38, 45
5. Emotional Demands:	3, 9, 13, 18, 23, 27, 32, 36, 39, 41, 44, 46, 47
6. Dying with Grace:	30, 42

References Relevant to the Psychometric Properties of the SSPON:

Hinds P, Fairclough D, Dobos C, Greer R, Herring P, Mayhall J, Arheart K, Day L, McAulay L. Development and testing of the "Stressor Scale for Pediatric Oncology Nursing". Cancer Nurs 13(6):354-360, 1990.

Hinds P, Sanders B, Srivastava D, Hickey S, et al. Testing the stress-response sequence model in pediatric oncology nursing. J Adv Nurs 28(5):1146-1157, 1998.

Hinds P. Testing the Stress-Response Sequence in Pediatric Oncology Nursing. J Pediatr Oncol Nurs 17(2):59-68, 2000.

Hinds PS, Srivastava DK, Randall EA, Peacock A, Stanford D, Pinlac R, Tong X, Tyc V, Davis J,Taylor K. Testing the revised stress-response sequence model in pediatric oncology nurses. J Pediatr Oncol Nurs, 20 (5): 213-232, 2003.

THE STRESSOR SCALE FOR PEDIATRIC ONCOLOGY NURSES

This scale contains statements made by pediatric oncology nurses that describe job-related situations, feelings, and actions which are stressful. The term "stressful" is being used here to refer to major and minor demands or hassles. Please read each item and indicate how stressful each item is for you. There are no right or wrong answers, only your honest opinions. It is very important that you answer each item with your true opinion.

Beneath each item is a horizontal line. On each end of the line is a phrase indicating how stressful that item could be. To indicate how stressful the item is for you, please place a straight line through the horizontal line (e.g., ). Where you place your mark on the horizontal line does have meaning. You may place your mark anywhere across the horizontal line.

If you have not experienced what the item is describing, please leave that item blank (make no mark on the line).

1. **Feeling a coworker doesn't care enough about doing a good job.**

   NOT AT ALL STRESSFUL _____ AS STRESSFUL AS CAN BE

2. **Coworker calls in sick when I know that's not true.**

   NOT AT ALL STRESSFUL _____ AS STRESSFUL AS CAN BE

3. **Working with someone who tries to find something you have done wrong.**

   NOT AT ALL STRESSFUL _____ AS STRESSFUL AS CAN BE

4. **Working with someone I don't think is competent.**

   NOT AT ALL STRESSFUL _____ AS STRESSFUL AS CAN BE

5. **Not being able to get a prompt enough response from a doctor.**

   NOT AT ALL STRESSFUL _____ AS STRESSFUL AS CAN BE

6. **Feeling we have waited too long to do something that could help a patient.**

   NOT AT ALL STRESSFUL _____ AS STRESSFUL AS CAN BE

7. **Coworker not taking the initiative when there is work to be done.**

   NOT AT ALL STRESSFUL _____ AS STRESSFUL AS CAN BE

8. **Watching a patient suffer and not be able to do anything about it.**

   NOT AT ALL STRESSFUL _____ AS STRESSFUL AS CAN BE

9. **Coworker not realizing how busy I am and starts making demands on me.**

NOT AT ALL STRESSFUL _____ AS STRESSFUL AS CAN BE

10. **When nurses and doctors are not communicating well about patients.**

NOT AT ALL STRESSFUL _____ AS STRESSFUL AS CAN BE

11. **When there is nothing more we can do, to provide comfort for a patient.**

NOT AT ALL STRESSFUL _____ AS STRESSFUL AS CAN BE

12. **When a new patient is admitted and I think of all that is ahead for him/her.**

NOT AT ALL STRESSFUL _____ AS STRESSFUL AS CAN BE

13. **Working with infants who have a very rare form of cancer.**

NOT AT ALL STRESSFUL _____ AS STRESSFUL AS CAN BE

14. **When a newly diagnosed patient who is just beginning treatment dies right away.**

NOT AT ALL STRESSFUL _____ AS STRESSFUL AS CAN BE

15. **Working with teenagers who are used to being independent and are becoming more and more dependent.**

NOT AT ALL STRESSFUL _____ AS STRESSFUL AS CAN BE

16. **Knowing a patient has given up.**

NOT AT ALL STRESSFUL _____ AS STRESSFUL AS CAN BE

17. **Dealing with families who do not speak English.**

NOT AT ALL STRESSFUL _____ AS STRESSFUL AS CAN BE

18. **Dealing with parents who have too much hope.**

NOT AT ALL STRESSFUL _____ AS STRESSFUL AS CAN BE

19. **Seeing parents react to the diagnosis and prognosis.**

NOT AT ALL STRESSFUL _____ AS STRESSFUL AS CAN BE

20. **Watching a family suffer.**

NOT AT ALL STRESSFUL ——— AS STRESSFUL AS CAN BE

21. **When a patient who has been hospitalized a long time dies.**

NOT AT ALL STRESSFUL ——— AS STRESSFUL AS CAN BE

22. **When other professionals do more than they are qualified to do.**

NOT AT ALL STRESSFUL ——— AS STRESSFUL AS CAN BE

23. **When the child screams when I'm trying to start an I.V.**

NOT AT ALL STRESSFUL ——— AS STRESSFUL AS CAN BE

24. **When a favorite patient dies.**

NOT AT ALL STRESSFUL ——— AS STRESSFUL AS CAN BE

25. **Working with teenagers who know exactly what is happening to them.**

NOT AT ALL STRESSFUL ——— AS STRESSFUL AS CAN BE

26. **Seeing a patient relapse.**

NOT AT ALL STRESSFUL ——— AS STRESSFUL AS CAN BE

27. **Dealing with parents who don't trust me.**

NOT AT ALL STRESSFUL ——— AS STRESSFUL AS CAN BE

28. **Thinking about all that family members need to know about the disease and its treatment.**

NOT AT ALL STRESSFUL ——— AS STRESSFUL AS CAN BE

29. **Not being able to get caught up.**

NOT AT ALL STRESSFUL ——— AS STRESSFUL AS CAN BE

30. **Seeing what I believe is going beyond aggressive care for a patient and not letting the patient die.**

NOT AT ALL STRESSFUL ——— AS STRESSFUL AS CAN BE

31. **When equipment and supplies are just not available.**

NOT AT ALL STRESSFUL — AS STRESSFUL AS CAN BE

32. **Using equipment I'm not familiar with.**

NOT AT ALL STRESSFUL — AS STRESSFUL AS CAN BE

33. **When a manager doesn't arrange for adequate staffing.**

NOT AT ALL STRESSFUL — AS STRESSFUL AS CAN BE

34. **Making mistakes.**

NOT AT ALL STRESSFUL — AS STRESSFUL AS CAN BE

35. **Feeling I can't get all of my work done.**

NOT AT ALL STRESSFUL — AS STRESSFUL AS CAN BE

36. **Feeling that I've gotten too close to a patient or family.**

NOT AT ALL STRESSFUL — AS STRESSFUL AS CAN BE

37. **When patients die at home rather than here at the hospital with us.**

NOT AT ALL STRESSFUL — AS STRESSFUL AS CAN BE

38. **Not knowing how to help a patient have more determination to get better.**

NOT AT ALL STRESSFUL — AS STRESSFUL AS CAN BE

39. **Feeling dissatisfied with how I personally handle the dying of a special patient.**

NOT AT ALL STRESSFUL — AS STRESSFUL AS CAN BE

40. **When a nursing/medical administrator doesn't really know about what is going on with patients.**

NOT AT ALL STRESSFUL — AS STRESSFUL AS CAN BE

41. **Trying to meet the needs of both the patient and the family.**

NOT AT ALL STRESSFUL — AS STRESSFUL AS CAN BE

42. **Having to continue tests on patients who are on terminal care.**

NOT AT ALL STRESSFUL — AS STRESSFUL AS CAN BE

43. **Trying to teach patients and families plus getting my other work done.**

NOT AT ALL STRESSFUL — AS STRESSFUL AS CAN BE

44. **Not being certain of what to say to parents of a newly diagnosed child.**

NOT AT ALL STRESSFUL — AS STRESSFUL AS CAN BE

45. **Not feeling comfortable with my skills.**

NOT AT ALL STRESSFUL — AS STRESSFUL AS CAN BE

46. **When I can't answer a question about my patient.**

NOT AT ALL STRESSFUL — AS STRESSFUL AS CAN BE

47. **Not being certain of what to say to parents of a dying child.**

NOT AT ALL STRESSFUL — AS STRESSFUL AS CAN BE

48. **When a nursing/medical administrator doesn't try to make a problem situation better.**

NOT AT ALL STRESSFUL — AS STRESSFUL AS CAN BE

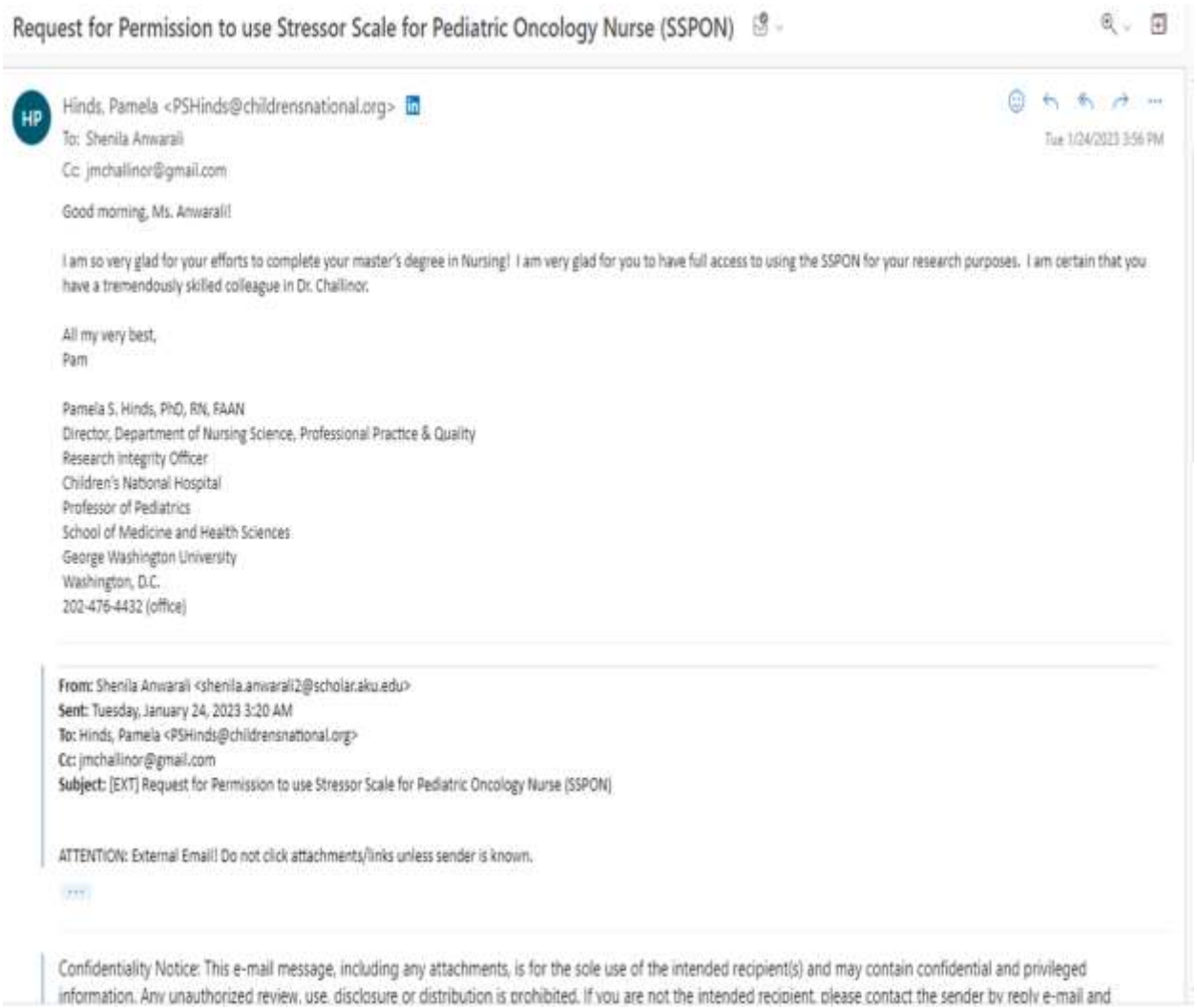
49. **Hospital services are not available around the clock, seven days a week.**

NOT AT ALL STRESSFUL — AS STRESSFUL AS CAN BE

50. **When staffing plans are inadequate.**

NOT AT ALL STRESSFUL — AS STRESSFUL AS CAN BE

Appendix I Permission letter for using the Tool



Request for Permission to use Stressor Scale for Pediatric Oncology Nurse (SSPON)

HP

Hinds, Pamela <PSHinds@childrensnational.org>

To: Shenila Anwarali

Cc: jmchallinor@gmail.com

Tue 1/24/2023 3:56 PM

Good morning, Ms. Anwarali!

I am so very glad for your efforts to complete your master's degree in Nursing! I am very glad for you to have full access to using the SSPON for your research purposes. I am certain that you have a tremendously skilled colleague in Dr. Challinor.

All my very best,
Pam

Pamela S. Hinds, PhD, RN, FAAN
Director, Department of Nursing Science, Professional Practice & Quality
Research Integrity Officer
Children's National Hospital
Professor of Pediatrics
School of Medicine and Health Sciences
George Washington University
Washington, D.C.
202-476-4432 (office)

From: Shenila Anwarali <shenila.anwarali2@scholar.aku.edu>
Sent: Tuesday, January 24, 2023 3:20 AM
To: Hinds, Pamela <PSHinds@childrensnational.org>
Cc: jmchallinor@gmail.com
Subject: [EXT] Request for Permission to use Stressor Scale for Pediatric Oncology Nurse (SSPON)

ATTENTION: External Email! Do not click attachments/links unless sender is known.

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