PREVALENCE OF STRESS AND ASSOCIATED FACTORS AMONG NURSES WORKING IN INTENSIVE CARE UNIT AT MUHIMBILI NATIONAL HOSPITAL DAR ES SALAAM, TANZANIA

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MSc. Critical Care and Trauma Nursing Dissertation

Muhimbili University of Health and Allied Sciences

May, 2013

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By

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A Dissertation to be submitted in Partial Fulfillment of the Requirement for the Degree of Msc. Critical Care and Trauma Nursing of Muhimbili University of Health and Allied Sciences.

Muhimbili University of Health and Allied Sciences.

May, 2013

CERTIFICATION

The undersigned certify she has read and hereby recommend for acceptance of dissertation entitled ***Prevalence of stress and associated factors among nurses working in Intensive Care Units at Muhimbili National Hospital*** in partial fulfillment of the requirements for the degree award of Master of Science (Critical Care and Trauma Nursing) of Muhimbili University of Health and Allied Sciences.

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Dr. Edith, A. M. Tarimo

(Supervisor)

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Date

DECLARATION

I, **Mkiga Salama Mohamed**, declare that this dissertation report is my own original work. It is being submitted for the Degree of Master of Science in Nursing MUHAS. It has not been presented and will not be presented to any other university for a similar or any other degree award.

Signature …… Date ……

ACKNOWLEDGEMENTS

My gratitude and thanks goes to God for giving me health and capacity during the whole course of my studies.

I am deeply indebted to Dr Edith Tarimo, my main supervisor and Dr Anne Outwater (co-supervisor) for their commitment to supervise the preparation of this dissertation. I appreciate their constructive comments and encouragement from initial development of the proposal to the final completion of this work.

Also I am grateful to the academic and non academic members of staff school of nursing as this work could not be possible without their inputs and positive comments.

My gratitude and appreciation also go to Intensive Care Unit, Emergency Medicine Department and other Critical Care nurses at Muhimbili National Hospital for their keen participation in this study.

Lastly, I would like to acknowledge the patience, understanding and sacrifice from my parents Mr and Mrs Mkiga.

DEDICATION

To my parents Mr. and Mrs. Mkiga, my brothers, my sisters, my uncles and aunts, my children and my friends.

ABSTRACT

Background

Stress is a physical or psychological response towards unbalanced demands and resources. It is becoming increasingly recognized as one of the most serious occupational hazards for nurses who work in critical care units. Poor stress management in Intensive Care Unit (ICU) among nurses has serious impact to the patients care and outcome; and the result is increasing cost to the organization and the nation as a whole. The aim of this study was to identify prevalence of stress and associated factors among ICU nurses working at Muhimbili National Hospital (MNH).

Materials and methods

A descriptive cross sectional study design was conducted to assess prevalence of stress symptoms and associated factors. A total of 80 nurses working in ICUs such as Main ICU, Cardiac ICU, Acute Pediatric Care Unit (APCU), Emergency Medicine Department and Highly Dependent Unit at MNH were recruited. A questionnaire with 31 items was used. Data was coded and entered into SPSS version 16.0 (Statistical Package for Social Sciences) for descriptive analysis and inferential statistics.

Results

Out of 80 participants 69 (87%) were female nurses; 62 (78%) were nurse officers with diploma or degree while 18 (23%) were nurses with certificates. Significant stress symptoms were physical stress symptoms which include (back pain, headache, chest pain, stomach upset and sudden weight gain/loss); forty eight (60%) of the participants had physical stress symptoms and mean score was = 2.23 and (SD = 1.49) (moderate), thirty (38%) had psychological stress symptoms and mean score was = 1.23 (SD = 1.21) (mild), and twenty (25%) of the participants had behavioral change and mean score for behavioral changes was = 0.85 (SD= 0.92) (mild). Therefore significant stress symptom was physical stress symptoms since 60% of the participants had physical stress symptoms. By multivariate analysis three factors were associated with significant stress symptoms: 1. Personal characteristics with p-value = 0.07 for physical stress and 0.04

for psychological stress 2. Interpersonal relationship with p- value 0.05 for physical stress and 0.04 for psychological stress 3. Management issues with p- value= 0.01 for physical stress.

Conclusion

Majority of ICU nurses at MNH suffer moderate physical stress which was associated with poor interpersonal relationship, personal characteristics and management issues. Therefore, these factors need further investigation and additional methodological approaches to deal with issues such as recall bias, selection bias and information bias.

Recommendations

ICU nurses need to learn effective stress coping mechanisms like how to position themselves while turning or lifting patients.

The organization has to look for possibilities to get enough and durable efficient adjustable beds to lessen nurses' muscle straining, and efforts to raise staffing requirements since physical stress symptoms are the ones found to be significant.

Also the hospital management should encourage good communication skills and interpersonal interaction that are potent for team work building.

The researcher recommends qualitative approach in future to study coping mechanisms which the nurses use in managing the physical stress.

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LIST OF ABBREVIATIONS

ICU	Intensive Care Unit
APCU	Acute Pediatric Care Unit
HDU	Highly Dependency Unit
CT-ICU	Cardio - Thoracic Intensive Care Unit
MUHAS	Muhimbili University of Health and Allied Sciences
MNH	Muhimbili National Hospital
EMD	Emergency Medicine Department
SPSS	Statistical Package of Social Science
NIOSH	National Institute for Occupational Safety and Health
MOHSW	Ministry of Health and Social Welfare

CHAPTER ONE: INTRODUCTION

1.0: BACKGROUND

Stress is defined as high psychological demands and low decision-making power on the job (Vittorio, 2003). Stress is also defined as ones response to a mismatch between the perceived demands and the ability of the individual to cope with these demands (NIOSH, 2010). Stress has been categorized as an antecedent or stimulus, as a consequence or response, and as an interaction (Jennings, 2008). ICU nurse stress follows a pattern of reactions that occurs when nurses are presented with work demands not matched to their knowledge, skills or abilities and which challenge their ability to cope (Owolabi, OlaOlorun, & Olofin, 2012).

Normally, the concern about health and safety of ICU nurses is put on chemical, biological and physical hazards, while the psychosocial risks at work are still largely ignored and their causes and consequences still inadequately understood especially in the developing countries. Unlike physical or chemical hazards, ICU nurse stress has no obvious tangible hazardous agent (Owolabi et al., 2012). Stress can be manifested physically, emotionally, cognitively and as behavioral change (Melinda, Robert, & Jeanne, 2012). High levels of work-related stress have been identified as one of the main precipitating causes of burnout in ICU nurses (Bakker, Le Blanc, & Schaufeli, 2005). It is not passed unnoticed among researchers that ICU nurses are confronted on a daily basis by the kind of stressful situations that precipitate work-related problems such as absenteeism, high staff turnover, a reduction in the quality of patient care, a deterioration in morale, and a significantly high incidence of staff conflicts; all of which are symptoms and signs that precede the development of burnout (Poncet et al., 2007).

Intensive Care Unit nurse should not be left to acquire these symptoms because the consequences will be job dissatisfaction, reductions in the quality of care and patient satisfaction, guilty, deterioration in the nurses' health, abandoning critical care as a nursing specialty and great effects on the clinical practice and the personal lives of nurses who work in critical care environments (Bakker et al., 2005)

Only limited studies on experiences of nurses working in intensive care units have been published in Africa. Most research papers in Africa have tended to focus on health professionals in general (Mbuthia, 2009). Prevalence of stress has also been identified in doctors and nurses who work for prolonged periods with patients with Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS) in South Africa (Uebel, Nash, & Avalos, 2007). Over twenty percent (26.2%) of the subjects in a study on work-related stress perception and hypertension amongst health workers of a mission hospital in South-western Nigeria, perceived themselves as stressed at work (Owolabi et al., 2012). Prevalence of stress and burnout in critical care nurses working at Aga Khan University hospital Nairobi Kenya was found to be 64% (Mbuthia, 2009). Prevalence of stress-related illnesses were found to be 15.6% for hypertension, 9.1% stomach ulcer, 4.5% diabetes, 3.3% minor mental distress, 3.1% major mental distress and 3.5% asthma in South Africa (Peltzer, Shisana, Zuma, Van, & Zungu, 2009). The nurse's role has long been regarded as stress-filled based upon the physical labor, human suffering, work hours, staffing, and interpersonal relationships that are central to the work nurses do (Jennings, 2008).

Burnout has been described as workers' reactions to the chronic stress common in occupations involving numerous direct interactions with people (Jennings, 2008). Burnout is further described as a syndrome characterized by emotional exhaustion, depersonalization, and reduced personal accomplishment. Female nurses suffer a great deal from stress due to combined responsibilities of work, marriage, and children (Mbuthia, 2009). There is no published study specifically done in Tanzania that has assessed and established prevalence of stress among ICU nurses. Therefore, this study is aimed at assessing the prevalence of stress and the associated factors among ICU nurses at Muhimbili National Hospital.

1.1: PROBLEM STATEMENT

Stress has been acknowledged as a significant problem in intensive care unit (ICU) since their inception in 1960 and arises from many different factors and conditions (Raja, Saadiah, Santhna, & Nizam, 2007). Globalization and changes in the nature of health care delivery have resulted in increasing ICU nurse stress in developing countries. Stress in ICU nurses at present is already acknowledged as one of the epidemics of modern working life (Owolabi et al., 2012).

Effect of work stressors to ICU nurses can be physical, psychological or behavioral changes (Raja et al., 2007). A physical response to stress is associated with ulcers, cardiac disorders and skin rashes. Psychological response to stress is associated with outbursts of anger, unnecessary worries and frequent mood changes. Mood changes include tension, anxiety, fatigue and depression. Studies have indicated that increased stress can lead to job dissatisfaction, burnout, and precipitate attrition from intensive care units, thereby increasing employment costs and can affect the competence and job performance of nurses and ultimately can have an impact on the patient and compromise patient's care (Jennings, 2008; Mbuthia, 2009; Poncet et al., 2007 & Raja et al., 2007).

The researcher experience on working in the ICUs at Muhimbili National Hospital revealed a number of stress related problems among staff members of which the magnitude and origin has not been identified and documented. From experience, interpersonal conflicts (between nurses and between nurses and Doctors)**,** physical illness, reduced morale to work, persistent lack of confidence among staff members and some saying that ICU is not a place to work for life (Jennings, 2008; Mbuthia, 2009; Raja et al., 2007) are also common conditions and complaints of ICU nurses at MNH. Also the researcher through experience in working at MNH ICUs came across some staff members who are almost burnout. Uncovering prevalence and the origin of stress among ICU nurses at MNH will raise awareness to the nurses that will make them think of developing effective stress coping skills for their health, and this may lead to improved job performance and patient's satisfaction. The results will also increase

awareness to the higher organization such as the Ministry of Health and Social Welfare (MOH &SW) so that they may take appropriate actions.

1.2: RESEARCH QUESTIONS

1. What are the factors leading to stress among nurses in the ICUs at MNH?
2. What are the symptoms of stress experienced by ICU nurses at MNH?

1.3: MAIN OBJECTIVE

To identify the prevalence and factors associated with stress symptoms among nurses working in ICUs at MNH.

SPECIFIC OBJECTIVES

1. To determine prevalence of significant stress symptoms among nurses working in ICUs of MNH.
2. To determine factors associated with significant stress symptoms among nurses working in ICUs of MNH.
3. To determine significant stress symptoms among ICU nurses at MNH.

1.5: CONCEPTUAL MODEL

The conceptual model for this study is guided by ideas of Roy's Adaptation Model (Frederickson, Jackson, Strauman, & Strauman, 1991). Roy assume that human beings are constantly exposed to environmental stimuli on which, if one adapt positively will have enhanced growth and competence (health) and for those with negative adaptation will end up with burnout (illness). Interpersonal conflict, work overload and its demands, personal characteristics, management issues and ICU environment are among the postulated sources of stress (stimuli) to ICU nurses in the previous studies (Jennings, 2008; Ling, Taiwanai, Lai, & Peng, 2005; Mbuthia, 2009). This model has been used to guide the researcher in literature review, development of study tool and discussion of the results.

Factors associated with stress

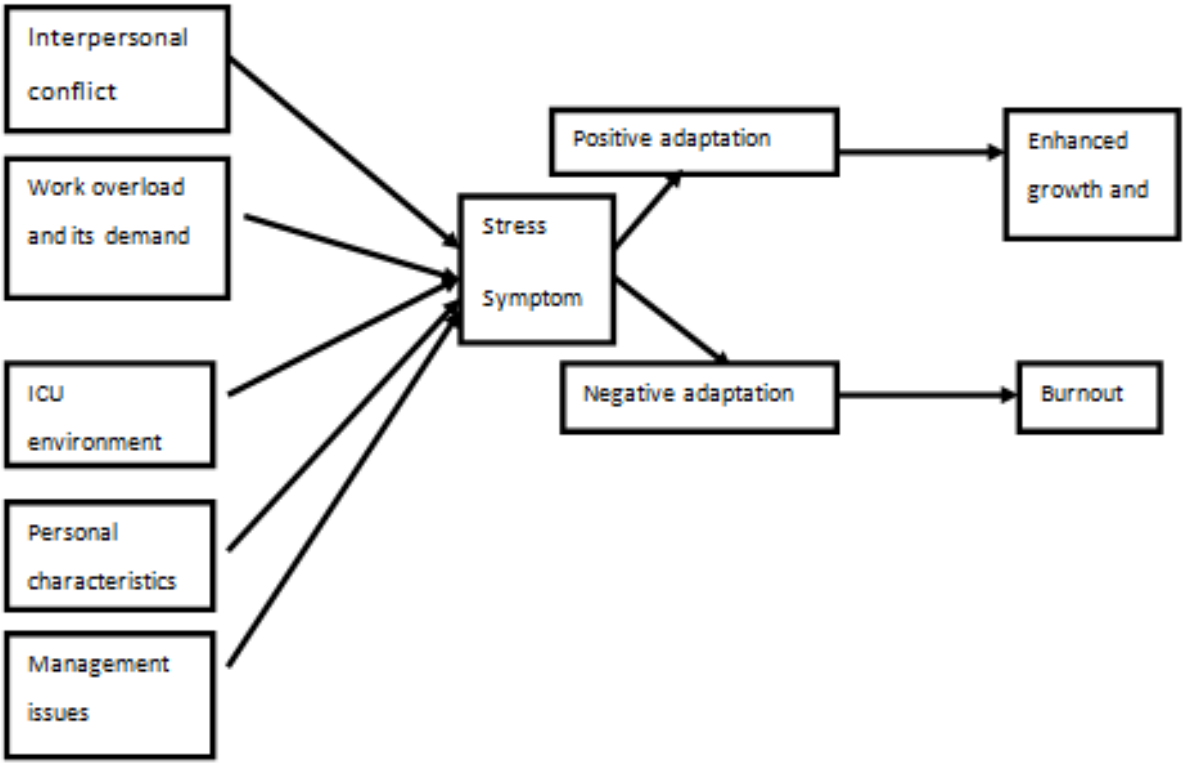

Figure 1: Conceptual framework on Factors associated with stress

DESCRIPTION OF THE COMPONENTS OF THE CONCEPTUAL MODEL AS APPLIED TO THE PRESENT STUDY

Interpersonal relationship as stressor has been assessed by asking nurses whether they had conflict with fellow nurse, supervisor or a doctor in the previous six months including the date of the study.

Work overload and its demands has been explained by the number of patients taken care of by a nurse per shift; so nurses were asked whether they are comfortable or not to take care of two to three patients.

ICU environment is also a source of stress, noise from alarms of machines connected to the patient and those coming from systems not connected to the patient; Climatic condition (cold) of ICU is also very uncomfortable to some staff members leading to

physical inactivity and reduced work performance; inadequate safety due to slippery flows in some units; lack of user friendly equipments like oxygen sources; continuous exposure to death and dying patients, human suffering, and despaired relatives who constantly need psychological and emotional support are also very stressful situations to ICU nurses.

Personal characteristics can also determine whether a nurse is being stressed or not. Gender, age, level of education, work experience, marital status and having ICU trained or not are elements of personal characteristics.

Management issues were assessed for whether being a stressor or not by asking nurses about their perception on the roles they perform according to their education levels; also nurses were asked about how they feel when they are taking care of a critically ill patient who sometimes needs vital sign recording at 15 minutes interval, at the same time required to trace other paramedics who sometimes take hours to respond. This is very common at MNH, shortage; poor ICU organization; and inadequate workers motivation may be the reasons for that.

Positive adaptation means constructive response to sources of stress that lead to personal growth and enhanced competence.

Negative adaptation means destructive response to stressors that lead to burnout.

1.6: SIGNIFICANCE OF THE STUDY

This study will provide useful information for both nursing administrators and nurses who work in ICUs. It will increase the degree of awareness of stress related symptoms among nurses so that they can find coping skills, take personal measures to prevent symptoms of stress and deal with the factors that make the ICU environment stressful for nurses. It will also build foundation for future studies on stress among nurses in Tanzania. The study results may also help nursing administrators to deal with all the organizational factors that are associated with stress and apply appropriate measures.

CHAPTER TWO: LITERATURE REVIEW

2.1 INTRODUCTION

In order to provide an authoritative understanding of how stress develops in critical care units, the researcher undertook a comprehensive review of the literature on the subject. Literature search was undertaken as follows: I used data bases like Hinari, Pubmed and Google scholar to search for the relevant articles, where I had to follow main key points such as identifying and writing keywords and phrases of my study question, including synonyms along with truncation. I applied limits like language and publication years; I selected literatures that are critically appraised to determine their quality and relevance to my study and I left those ones not critically appraised. Also the Librarians supported me during my literature search by giving me advice on resources to search and which data bases, and journals I had access to.

In brief, the literature search was loosely guided by the components of the conceptual model. Two main issues discussed in this chapter include: 'Symptoms of stress' and 'factors associated with stress'. Therefore by using the Conceptual model, it was possible to keep the literature search within the key areas of the study.

2.2 Symptoms of stress

Melinda and colleagues (Melinda et al., 2012) categorized stress symptoms into four groups which are: Cognitive symptoms, emotional symptoms, physical symptoms and behavioral symptoms.

2.2.1 Cognitive and Emotional symptoms (Psychological symptoms)

Cognitive symptoms of stress include memory problems; inability to concentrate; poor judgment; seeing only the negatives; anxious or racing thoughts; guilty and constant worrying. According to (Mbuthia, 2009), this prevents the sufferer from being able to concentrate; make decisions and complete even normal routine tasks.

Emotional symptoms of stress include depression or general unhappiness, changing moods, agitation, inability to relax, feeling overwhelmed, sense of loneliness and isolation, undefined fears, increased tension, irritability and anxiety. If a nurse gets these symptoms with no positive adaptation will end up with distancing him/herself from his/her colleagues. This kind of behavior makes colleagues uncomfortable resulting in people becoming dissatisfied with their job in the organization (Linden, Keijsers, Eling, & Schaijk, 2005)

2.2.2. Physical symptoms

Physical symptoms include headaches, dizziness, back pains, chest pains, loss of sexual drives, sudden loss or gains of weight, chronic fatigue, frequent colds, gastrointestinal disorders, and coronary disease (Lee, Mun, Lee, & Cho, 2011; Owolabi et al., 2012; Raja et al., 2007). Many individuals with physical stress symptoms are susceptible to physical injuries unless they have effective coping skills. Hypertension, an increased heart and respiration rate, as well as high levels of serum cholesterol, have also been linked to stress.

2.2.3. Behavioral symptoms

Behavioral symptoms of stress include eating more or less, sleeping too much or too little, isolating yourself from others, neglecting responsibilities, using cigarettes or drugs to relax, nervous habits (e.g. nail biting) (Melinda et al., 2012), turnover, increased sick leave, absenteeism, resistance to change, being over -dependent on supervisors, "going by the book", increased number of accidents and inability to organize (Mbuthia, 2009; Raja et al., 2007).

2.3 Factors associated with stress

2.3.1 Interpersonal relationship

Working in Intensive Care Units needs effective multidisciplinary collaboration. The nurse who works in ICUs has to interact with her colleagues, with doctors, with her supervisors and with the nurse manager. Negative interaction between either groups is a good source of stress (Bakker et al, 2005). Conflict between nurses most of the time occurs as a result of one not appreciating the work or behavior of others. Such negative attitudes appear in the form of back-stabbing, malicious gossiping, belittling gestures, constant carping criticism, and attempts to make excessive demands of others. Nurses who are attacked by these kinds of humiliation lose morale of work, get symptoms of depression, and develop low self-esteem and career fatigue that are the precursors of stress and burnout (Mbuthia, 2009).

Nurse-physician therapeutic relationship in clinical setting is very crucial. When the nurse and physician set goals together for their patients' care and treatment, stress to the nurse becomes minimal because the nurse feels respected, affirmed and appreciated. Verbal aggressions from physicians bring about violence and reduced morale of work which is the sign of stress (Raja et al., 2007).

Conducive ICU nursing environments are contributed by respectful relationships between nurses and nurse supervisors. Leaders have a role in the success of nursing teams. So effective communication skills, involvement in decision making and effective and respectful clinical supervision can minimize development of stress and burnout (Bennett, LOWE, Matthews, Dourali, & Tattersall, 2001; Jennings, 2008; McCarthy, Power, & Greiner, 2010; Poncet et al., 2007; Curtis & Kathleen 2007). Effective supervision brings about minimal stress leading to job satisfaction and retention of nurses (Dill, 2008).

2.3.2 Workload and its demands and resources

Workload refers to the relationship between the demands of the work and the time in which it has to be performed and the resources that are available to the nurse who must perform it (Leiter & Maslach, 1999). Organizational expectations about how much work that has to be performed, the time in which it has to be performed, and the resources with which it must be accomplished, are perceived as excessive workload that lead to stress (Raja et al., 2007). Work overload of nurses is one of the important causes of stress and burnout (Poncet et al., 2007). Many previous studies on effects of increased nurse workloads have clearly shown how work overloads affect a nurse's physical and mental health (Bakker et al., 2005; Mbuthia, 2009; Raja et al., 2007).

Job demands refer to the physical, psychological, social and organizational aspects of a job that require sustained physical and/or psychological (cognitive or emotional) effort and that therefore make certain physiological and/or psychological demands on those who work in them. Job demands become significant stressors when the degree of effort required by a health care provider to meet the demands of the job is higher than he/she can afford (Owolabi et al., 2012). Examples of job demands that result in stress are an increased workload (due to addressing specific needs at the end of life, performing cardiopulmonary resuscitation, prolonging life by artificial support to critical ill patients (Mealer, Shelton, Berg, Rothbaum, & Moss, 2007); unexpected number of patients at any time, unexpected rapid change in patients condition and response to distressing or traumatic incidents (e.g. sudden death, inappropriate attendees and verbal abuse) (Gholamzadeh, Sharif, & Rad, 2011); role conflict and ambiguity, the demands made by shift work, and unreasonable deadlines (time pressure) (Mbuthia, 2009). Stress and burnout can also be induced by limited resources including effective equipments, psychological well being, social support and organization resources (salary, career opportunities and job security).

Job resources may also be in terms of (role clarity, participation in decision-making, performance feedback, skill variety, and task significance) (Bakker et al., 2005; Ling et

al., 2005). Availability of working equipments and full organizational support can secure employees from stress and burnout.

2.3.3 ICU environment

ICU environment itself creates stress for nurses; due to noise from persisted uncontrolled alarm systems that add up to nurses' mental and physical attention. Alarms from machines connected to the patient are mandatory to respond; and those coming from systems not connected to the patient should also be responded because noise is a stressor to the nurse and patients.

Climatic condition (cold) (Poncet et al., 2007) of ICU is also very uncomfortable to some staff members leading to physical inactivity and reduced work performance; inadequate safety due to slippery flows to some units; lack of user friendly equipments like oxygen sources and minimum space (Gholamzadeh et al., 2011); very few nurses are comfortable to deal with oxygen cylinders when it comes to a point you are required to change immediately in the absence of the technicians. Continuous exposure to death and dying patients, human suffering, despaired relatives who constantly need psychological and emotional support (Raja et al., 2007; Preto & Pedrao 2009) and frequent seeing people rushing around busily performing lifesaving tasks are also very stressful situations to ICU nurses. Improper ICU design can hinder nurses' performance and safety (Gurses et al., 2009) contributing to stress. Stressful experiences may lead to work-related problems such as staff conflicts, absenteeism, lowered morale, decreased productivity and ultimately burnout (Raja et al., 2007).

2.3. 4 Personal characteristics

Personal characteristics are also associated with stress and burnout (Moreira, Magnago, Sakae, & Magajewski, 2009). Different researchers have described age, gender, marital status, level of education, work experience and whether an individual got formal ICU training or not as personal characteristics associated with stress.

Effect of age on stress has been described differently by different authors. Example (Jennings, 2008) in his study on Work Stress and Burnout Among Nurses: Role of the

Work Environment and Working Conditions, found that age is inversely related to stress level (stress level decrease with increased age). Conversely (Koivula, Paunonen, & Laippala, 2000) in their study on burnout among nursing staff in two Finnish hospitals found that stress level increase with age.

Female nurses are more stressed compared to male nurses due to the nature of their responsibilities. Female married nurses have combined work and home stress (Jennings, 2008). The study done by (Thorsen, Tharp, & Meguid, 2011) on burnout among maternal health staff at referral hospital in Malawi found that stress level is directly related to the number of children.

Nurses with bachelor and specialists are more stressed compared to nurses with diploma and certificates. Nurse specialists' expectation when they are employed is having different duties and roles compared to ordinary nurses. So when they find again they have to carry out dusting, patient transferring to other wards, urine emptying and night shifts, they get demoralized and emotional exhaustion leading to burnout (Mbuthia, 2009).

Work experience is also a determinant of stress having inverse relationship (stress decrease with increased number of years at work) (Al-Turki et al., 2010; Mbuthia, 2009; Raja et al., 2007). Raja and colleagues (Raja et al., 2007) in their study on prevalence of stress among ICU nurses in Malaysia also found that nurses who received post basic ICU course had low stress level as compared to those with no post basic ICU course.

2.3.5 Management issues

Management issues are also found to relate with ICU nurse stress (Gurses et al., 2009; Mims & Stanford 2004) which include motivation; staff participation in decision making on policy and protocol development; job description (unclear work or conflicting roles and boundaries), inadequate equipments and understaffing. Motivation can be in form of rewards, appreciation, performance feedback, promotion, career opportunities and progression. When nurses are given chances to participate in

discussions about their work with compensation for their engagement, they feel they are valued contributors of profession development. This increase morale of work and minimize the levels of stress (Mbuthia, 2009). Demoralization occurs when nurses are always treated as recipients of what has been decided by the organization even if it affects their work performance and quality of care. Having clear job description can minimize anxiety, physical, and emotional exhaustion to the nurses especially those with bachelors and specialists, because they find themselves in a well of multiple tasks when they are at work place. Work place factors causing stress can be categorized as those to do with the content of work and those to do with the social and organizational context of work (Michie, 2002). Those that are intrinsic to the job include long hours, work overload, time pressure, difficult or complex tasks, lack of breaks, lack of variety, and poor physical work conditions (for example, space, temperature, light). Unclear work or conflicting roles and boundaries can also cause stress. The possibilities for job development are important buffers against current stress, with under promotion, lack of training, and job insecurity being stressful (Michie, 2002). There are two other sources of stress, or buffers against stress: relationships at work, and the organizational culture. Managers who are critical, demanding, unsupportive or bullying create stress, whereas a positive social dimension of work and good team working reduces it. An organizational culture of unpaid overtime causes stress. On the other hand, a culture of involving people in decisions, keeping them informed about what is happening in the organization, and providing good amenities and recreation facilities reduce stress. Organizational change, especially when consultation has been inadequate, is a huge source of stress. Such changes include mergers, relocation, restructuring or “downsizing”, individual contracts, and redundancies within the organization (Michie, 2002).

CHAPTER THREE: METHODOLOGY

"Research methodology" refers to the techniques and methods that the researcher uses to give structure to a study and to gather and analyses information in a systematic fashion. It encompasses the entire strategy of the study from the identification and assessment of the problem to the final phase of data analysis, conclusions and recommendations (Mbuthia, 2009).

3.1 Study design

This study utilized a quantitative, cross sectional and descriptive study design. A descriptive design is used to describe the characteristics, prevalence, intensity or full nature of a phenomenon. The phenomenon investigated in this study was prevalence of stress, and associated factors. This design was chosen by the researcher because it would allow calculating frequencies and percentages of stress symptoms experienced by ICU nurses, calculating prevalence of stress and determining associated factors.

The strengths and advantages of quantitative research are summarized in the statements below:

- Testing and validating quantitative research results occur within the context of tried and tested theories about how (and, to a lesser degree, why) phenomena occur.
- A researcher can generalize quantitative results when the data has been derived from random samples of sufficient size.
- Quantitative research proceeds in an orderly and systematic fashion from the initial definition of the problem, to the selection of the concepts that are central to the study, and then to the analysis and collection of the information that will provide a solution to the problem.
- It is possible to generalize quantitative research findings and replicate them on many different populations and subpopulations.
- The quantitative research method can be used as the basis for making quantitative predictions.

- The collection of data by making use of certain quantitative methods can be accomplished relatively quickly (by means of telephone interviews, for example).
- A quantitative research design provides precise, quantitative, numerical data.
- It takes relatively less time to analyze quantitative data because there are many kinds of statistical software that have been designed specifically for this purpose.
- The research results obtained from quantitative research are relatively independent of the researcher (in, for example, their effect size and statistical significance).
- Research based on a quantitative designed may be accorded greater credibility by those who have the power and authority to make important decisions. Such people include private donors, administrators, government officials, those who are responsible for funding international programmes and initiatives, and the administrators of NGOs and charitable and philanthropic organizations.
- It is useful for studying very large samples of people (Bryman 2004; Polit & Beck 2004).

The weaknesses and disadvantages of quantitative research are summarized in the statements below:

- The categories used by the researcher may not reflect what a population understands by the phenomenon that is being investigated.
- Since it is necessary for quantitative research to reduce human experience to a few rigidly defined concepts in order to operate numerically, it is relatively narrow and inflexible in its scope and tends to obscure the important insights and fine distinction of information that are embedded in the phenomenon.
- It is very difficult to measure psychological phenomena such as morale, for example, by using a quantitative research design.
- A researcher using a quantitative research design may miss certain phenomena because of the focus on theory or hypothesis *testing* rather than on theory or hypothesis *generation* (called the *confirmation bias*).

- The knowledge that is produced by quantitative research methods may be too abstract and general for direct application to specific situations, contexts, and individuals.

3.2 Setting

This study was conducted in Intensive Care Units (general ICU, HDU, APCU and CT-ICU and Emergency Medicine Department) at Muhimbili National Hospital,
Dar es Salaam region, Tanzania**.** The researcher selected this hospital because it is a tertiary referral hospital with ICUs, where there is utilization of sophisticated technology in the management of critical ill patients. MNH serves all Dar es Salaam municipal hospitals and other regional hospitals in the country with 1500 bed capacity.

3.3 Study population

Population can be defined as the universe of units from which the sample is selected. These "units" may not necessarily mean only people; they may also be towns, regions, red blood corpuscles, etc (Bryman 2004).

Study population in this study was all nurses working in general ICU, High Dependent Unit, Pediatric ICU (APCU), Cardiac ICU and Emergency Medicine Department. Nurses working in these units are in constant exposure to need for knowledge on sophisticated technology, frequent traumatic events and ethical dilemmas concerning issues of patient care management; so they fit to be regarded as ICU nurses Total number of ICU nurses is about 132**.**

3.4 Sample size

Sample size calculation

Kish leslie formular $N = \frac{z^2 (P) (1-P)}{C^2}$

Where;

Z = Z value (e.g. 1.65 for 90% confidence level)

p = prevalence (0.64 found in a study done in Kenya by (Mbuthia, 2009)

c = margin of sampling error (i.e. 0.1)

$$N = \frac{1.65^2 (0.64) (1-0.64)}{0.1^2} = 62.7$$

Ten percent of 63 subjects which are 7 were added to adjust for non responders, which made a total of 70 subjects. Estimate time for data collection was one week.

3.5 Sampling procedure

The sample was selected by means of convenience sample. Convenience sampling is used when a researcher has reason to believe that the population that is being sampled is either homogeneous or else has characteristics being measured that are so randomly distributed that the outcome would not be materially affected by more sophisticated methods of sampling (Dorofeev & Grant 2004). Because the respondents in this study were all nurses who were working in intensive care units the researcher had reason to believe that they were more or less homogenous. Hence the appropriateness of the convenience sampling method for this research. Therefore, the researcher used duty rosters to identify the participants from each working shift to whom she could administer the questionnaires. Hence, data collection took place during working shifts: morning, evening and night shifts. Although the desired sample size was 70, the researchers succeeded to recruit 80 ICU nurses who participated in the study.

3.6 Sampling criteria

Inclusion criteria for the study required that the participants to have been registered by Tanzania Nurses and Midwives Council, Working in ICU and willing to give consent. Exclusion criteria of the study was being not working in ICU and not willing to give consent.

3.7 Description of the tool

Structured questionnaires which consisted of four sections: section A on socio-demographic data, section B are questions based on 25 Stress Inventory items by (Cole, 1992, as cited in (Raja et al., 2007). Only 12 Stress Inventory items seem to be

applicable in our setting divided into three subtopics: physical symptoms (5 items), psychological symptoms(cognitive and emotional) (4 items) and behavioral changes (3 items), section C were questions on the study variables influencing stress consisting of 12 items which address 5 clusters of stress sources from Critical Care Nurse Stress Scale (CCNSS) by (Sawatzky, 1996, as cited in (Ling et al., 2005): (1) nature of direct patient care (Job demands and resources), represented by item number 22 to 24 in the questionnaire (2) personal characteristics represented by questions in the demographic data section and items number 29 and 30 (3) interpersonal relationship, represented by item number 28 (4) management of the unit represented by item number 25 to 27 and (5) ICU environment itself, represented by item number 20 and 21 in the questionnaire. The tool was translated from English version to Kiswahili version to eliminate the problem of language barrier. All questions required nurses to answer 'Yes' or 'No' represented by a stress score '1' or '0'. The researcher decided to use close ended questions that needed Yes or No answers because ICU nurses are always such busy that open ended questions would need much time.

Strengths of questions that need 'Yes' or 'No' responses

• Questions that need Yes or No responses are more easily analyzed. Every answer can be given a number or value so that a statistical interpretation can be assessed. Yes or No questions are also better suited for computer analysis.

• Questions that need Yes or No responses can be more specific, thus more likely to communicate similar meanings.

• Questions that need Yes or No responses take less time from the interviewer, the participant and the researcher.

Weaknesses of questions that need 'Yes' or 'No' responses

• Because of the simplicity and limit of the answers, may not offer the respondents choices that actually reflect their real feelings.

• Questions that need Yes or No responses also do not allow the respondent to explain that they do not understand the question or do not have an opinion on the issue.

Section A and C were modified questions adapted from (Ling et al., 2005). Modifications done in section A include question on qualifications attained to suit the current nursing qualification classification (designation) in Tanzania, question on specialized area of nursing was removed since there was no comparison of stress between specialties, question on years of experience as a Registered Nurse replaced by question on ICU working experience and question on current area of practice also because there was no comparison of stress between areas of practice in the literature. Modifications done in section C include putting Yes or No response instead of perceived levels of stress 1 to 4, taken most of the items that represent components of the model as described above, however many questions with similar themes were reduced to one or few resulted to 12 questions instead of 17 and the researcher added two items that she thought would also reflect what was being measured. Section B questions (Stress Inventory) were adapted from (Raja et al., 2007). The researcher removed items from the Stress Inventory (with 25 items) that seem not applicable in the study setting that reduced the items to 12 and English was also simplified. Questionnaires were reviewed by the psychiatrists and nurse experts to assess relevance of the tool items by scoring the items on a scale of 1 to 3: 1 = not relevant; 2 = relevant, but not necessary; 3 = very necessary. The reviewed questions were not included in the data analysis. The reference time frame work for the expression of the stress symptoms studies in this work was six (6) months including the time of data collection.

3.8 Data collection

Data was collected from August 01st – 08th 2012 in the following sequence: Having Institutional Review Board ethical permit, the researcher requested permission from hospital's management to conduct the study. The researcher went to the unit managers with permission letter to explain the purpose of the study and self introduction to the nurses under the respective managers. Participants were requested to sign the informed consent form first, and if they agree to take part in the study, they were asked to fill the questionnaires. Questionnaires with attached consent forms were distributed to the available staff in each shift every day for eight (8) days. The participants were required to spend 20 to 30 minutes in order to complete the questionnaire. All approached

participants consented and filled the questionnaire. The researcher collected the completed questionnaires, checked for completeness and sealed them in an envelope.

3.9 Validity and reliability

Content validity was achieved by having the questionnaire reviewed by the psychiatrists and nurse experts to assess relevance of tool items and study objectives. To ensure face validity it was discussed by the nurse specialists if the questionnaire was clearly worded, well explained and if it addressed what it was meant to address: stress among ICU nurses. The questionnaire was pre-tested among nurse educators to assess reliability of the instrument and its applicability to the Tanzanian context. To evaluate the level of difficulty of the questionnaire, ICU nurses were asked to answer the questionnaire and the proportion of respondents who answered the questions correctly was assessed. Also reliability was maintained by ensuring consistency and accurate recording of data.

3.10. Ethical considerations

The following ethical requirements were taken into consideration during the study: The study was reviewed by the Institutional Review Board of Muhimbili University of Health and Allied Sciences. After ethical clearance was given the researcher proceeded with tracing permission letter from MNH management to conduct the study. Participants were required to sign the informed consent form first and then filled the questionnaires. Consent forms notified the participants of the purpose of the study and their rights as participants. The researcher told the participants that participation was voluntary and were assured of anonymity and confidentiality. To ensure confidentiality of the participants, no names were written during data collection and reporting. Participants were informed that one may refuse to fill the questionnaire and even discontinue participation in the study at any time with no penalty. Participants were allowed to ask questions in case of misunderstanding.

Completed questionnaires were collected by the researcher and sealed in the envelopes.

3.11 Data analysis and data management

The data was analyzed with the assistance of a statistician who used the Statistical Package for the Social Sciences (SPSS) (version 16.0) – a statistical software program

that enable the researcher to answer the research question and the objectives. Data was coded and entered into SPSS (Statistical Package for Social Sciences) version 16.0 for analysis**.** Any **Yes** response in the factor cluster items represented score 1 of a cluster and **No** response to all cluster items represented score 0 of a cluster**.** Characteristics of the sample were described by Socio-Demographic data; stress related symptoms and factors associated with significant stress symptoms were described by mean scores. The mean stress score scale was used to determine significant stress symptoms category among the three (physical, psychological and behavioral change). The mean stress score scale for physical subscale with 5 items ranges (0 – 1) for mild stress, (2 - 3) for moderate stress and (4 and above) for severe stress. The mean stress score scale for psychological stress subscale with 4 items ranges (0 – 1) for mild, (2 -3) for moderate and (4 and above) for severe. The mean stress score for behavioral change with 3 items ranges (0 – 1) for mild, 2 for moderate and 3 and above for severe. The symptom category with moderate to severe mean stress score was considered significant and the category with mild mean stress score was considered less significant. So symptoms category scored 2 to 5 were considered significant. The researcher then analyzed the differences in the mean score of the three categories of stress symptoms. When examining the relationship between stress as measured by the mean stress score scales and the selected demographic characteristics, and the investigated factors causing stress, the researcher used the statistical test to measure the association to maximize the interpretability of the results. Since the variables were measured on a categorical scale, the researcher carried out the Analysis of Variance (ANOVA) to measure the differences in the three categories of stress symptoms and the differences in the sources of stress between groups and within groups. The variables that she included were age, gender, marital status, designation, number of years of working in critical care units, having received formal ICU training or not, ICU environment, workload, interpersonal relationship, personal characteristics and management issue. Prevalence of stress was determined by calculating the percentage of the participants in the stress symptoms category with moderate to severe mean score levels (significant stress symptom).

3.12 Limitations

- The limitations of the study include, the fact that only one hospital was included which might have affected the generalizability of the findings.
- The use of quantitative design in the assessment of the factors associated with stress might have affected the internal validity of the study.
- The researcher used a convenience sample for the study. Convenience sampling is always accompanied by some potential for bias.
- The study was cross-sectional in nature. This means that it took place at one point in time. Such a study does not take into account staffing changes, managerial changes or the patient census of the units at the time when the study is conducted, and these factors may exert an impact on the responses of the nurses.
- In self-report, participants may exaggerate stress symptoms in order to make the situation worse or may under-report the severity or frequency of the problem/event

3.13 Dissemination

The copy of this study will be disseminated to school of nursing MUHAS, MUHAS library, and to hospital administration. The research findings will be published in nursing journals and presented in scientific nursing conferences. Ministry of Health and Social Welfare will also be given a copy in order to facilitate strategies to minimize stress among ICU nurses as stress has an effect on job performance and quality of nursing care.

CHAPTER FOUR: RESULTS

4.1 Personal characteristics

Distribution of personal characteristics showed that 40 (50%) were below 35 years and the other half were 35 and above years of age. Majorities (87%) of the participants were female and were married (59%). Over half of the participants were nurse officers either with diploma, degree or masters. However, most of them (72%) had not received formal ICU training and (84%) had worked in ICU for less than 10 years (Table 1).

Table 1: Distribution of Personal Characteristics (Demographic data)

variables	Frequency	Percentage	Cumulative frequency	Cumulative Percentage
Age				
Below 35	40	50	40	50
35 and above	40	50	80	100.00
Sex				
Females	69	86.25	69	86.25
Males	11	13.75	80	100.00
Marital status				
Married	47	58.75	47	58.75
Not married	33	41.25	80	100.00
Designation				
Nurses[1]	18	22.50	62	77.50
Nurse officers[2]	62	77.50	80	100.00
Trained	23	28.75	23	71.25
Not trained	57	71.25	80	100.00
Work experience	67	83.75	67	83.75
< 10 years				
10 and above	13	16.25	80	100.00

1. Nurses with certificate
2. Nurses with diploma, or degree
3. Received formal ICU training
4. Not received formal ICU training

4.2 Mean scores of stress distribution

Distribution of personal characteristics showed equal number of ICU nurses participated in this study in both age groups (Table 1). The mean score of physical stress symptoms for nurses aged below 35years was 2.68 with (Standard Deviation (SD) = 1.51), psychological symptoms mean score was 1.48 with (SD = 1.26) and behavioral change mean score was 1.05 with (SD = 0.96). Participants with age 35 years and above scored mean = 1.78 and SD = 1.35 for physical stress symptoms; mean = 0.98 and SD = 1.12 for psychological stress symptoms and mean = 0.65 with SD = 0.83 for behavioral change. This reflects that nurses with age below 35 years suffer moderate physical stress symptoms, mild psychological stress symptoms and mild behavioral change. Nurses with age 35 years and above suffer only mild stress.

The number of female nurses who participated in this study was greater 69 (87%) than that of male nurses 11(14%) indicating female dominance in the sample. Mean score of female nurses for physical stress symptoms was = 2.28 and (SD = 1.41), psychological stress symptoms mean score = 1.16 (SD = 1.18) and mean score for behavioral changes in female nurses = 0.83 (SD= 0.89). Mean score of male nurses in physical stress = 1.91 (SD = 1.97), psychological stress mean score = 1.64 (SD = 1.36) and behavioral change mean score = 1.00 (SD = 1.09). This reflects moderate physical stress with mild psychological stress and behavioral change for female participants and only mild stress in male nurses.

Majority 47(59%) of nurses were married with mean score for physical stress = 2.13 (SD =1.56), psychological stress mean score = 1.17 (SD = 1.20) and behavioral change mean score = 0.77 (SD = 0.89). 33 (42%) of the participants were not married with mean score for physical stress = 2.36 (SD = 1.41), psychological stress mean score =

1.30 (SD=1.24)
and behavioral change mean score = 0.97 (SD = 0.95). Both married and not married participants had moderate physical stress with mild psychological stress and behavioral change.

Highest qualifications (Designations) of the study participants were registered nurses with diploma, BScN Nurse Specialists and nurses with certificates, in this study two categories were formed which are Nurse Officers and Nurses respectively. Mean score for physical response to stress among nurse officers = 2.44 (SD= 1.57), mean score for psychological response to stress = 1.39 (SD= 1.26) and mean for behavioral change = 0.95 (SD = 0.93). Mean score for physical response to stress among nurses = 1.50 (SD=0.86), for psychological response to stress= 0.67 (SD= 0.84) and the mean score for behavioral change = 0.50 (SD= 0.79). So nurse officers suffer moderate physical stress with mild psychological stress and behavioral change while nurses with certificate suffer only mild physical stress, psychological stress and behavioral change.

More than a half of the participants 57 (72%) have not received formal ICU training while 23 (29%) received formal ICU training. Mean score for physical stress response =2.26 (SD= 1.63), psychological stress= 1.39 (SD= 1.19) and behavioral change= 0.83 (SD= 0.98) for trained participants. Mean score for physical stress response =2.21 (SD= 1.45), psychological stress= 1.16 (SD= 1.22) and behavioral change= 0.86 (SD= 0.89) for untrained participants. Both formally ICU trained and untrained participants suffer moderate physical stress and mild psychological stress and behavioral change.

In the category of work experience 67 (84%) participants had been working in ICU for less than 10 years and 13(17%) had 10 and above years of ICU work experience. The mean score for physical stress response of those with less 10 years of ICU work experience = 2.22 (SD = 1.44), psychological stress score = 1.31 (SD = 1.22) and behavioral change = 0.93 (SD= 0.93). The mean score for physical stress response of those with 10 and above years of ICU work experience =2.23 (SD = 1.79), psychological stress= 0.77 (SD = 1.09) and behavioral change = 0.46 (SD = 0.78). So

this category also showed moderate physical stress with mild psychological stress and behavioral change.

NB: As suggested by the statistician the mean stress score scale affirms that the stress symptoms subscales with moderate to severe mean score levels were considered significant in this study. Physical stress symptoms which scored moderate level in all selected categories of demographic data (personal characteristics) in this study were considered significant. (Both Table 1 and Table 2 give a summary of the above explanation).

Table 2: Comparison of means of Stress Inventory Categories and Personal Characteristics between groups and within groups.

Study variables	Physical Stress		Psychological Stress		Behavior changes	
	Mean	SD	Mean	SD	Mean	SD
Age						
Age below 35 yrs	2.68	1.51	1.48	1.26	1.05	0.96
Age above 35 yrs	1.78	1.35	0.98	1.12	0.65	0.83
Females	2.28	1.41	1.16	1.18	0.83	0.89
Males	1.91	1.97	1.64	1.36	1.00	1.09
Single	2.36	1.41	1.30	1.24	0.97	0.95
Married	2.13	1.56	1.17	1.20	0.77	0.89
Nurse officers	2.44	1.57	1.39	1.26	0.95	0.93
Nurses	1.50	0.86	0.67	0.84	0.50	0.79
ICU trained	2.26	1.63	1.39	1.19	0.83	0.98
Not trained	2.21	1.45	1.16	1.22	0.86	0.89
Work E.< 10 yrs	2.22	1.44	1.31	1.22	0.93	0.93
Work E. 10 and above	2.23	1.79	0.77	1.09	0.46	0.78

4.3 Descriptive statistics of Stress Inventory

The physical response to stress scores of the ICU nurses participated in this study ranged from a low of 0 to a high of 5. The mean score on this subscale was 2.23 (Standard Deviation (SD) =1.49). This reflects a moderate level of physical response to stress. The psychological scores ranged from a low of 0 to a high of 4, with a mean score of 1.23 (SD = 1.21). This can be interpreted as a mild level of ICU nurse's psychological response to stress. The nurses behavioral changes in response to stress scores; ranged from between a low of 0 and a high of 3, with a mean of 0.85 (SD = 0.92). This can be interpreted as a mild score (see table 2).

Table 3: Descriptive statistics of Stress Inventory

	N	Mean	S D	Minimum	Maximum
Physical	80	2.23	1.49	0	5
Psychological	80	1.23	1.21	0	4
Behavior change	80	0.85	0.92	0	3

In accordance with the mean stress score scale suggested by the statistician that the participants with moderate to severe scores were considered stressed. In this study the mean stress score of 2 and above is moderate to severe. Therefore Table3 shows that all participants had significant physical stress symptoms with mild psychological stress and behavioral change.

Table 4: Frequency of Nurses' physical response to stress

	Frequency	Percentage
0 -1 Mild	32	40%
2 -3 Moderate	31	39%
4 and above - Severe	17	21%

Table 4: Indicates that 48(60%) of the participants had moderate to severe stress score levels that represent having significant physical stress symptoms, 32(40%) had mild level of physical stress therefore less significant physical stress symptoms.

Table 5: Frequency of Nurses' Psychological response to stress

	Frequency	Percentage
0 -1Mild	50	62%
2 - 3Moderate	15	19%
4 and above – Severe	15	19%

Table 5 indicates that 30 (38%) of the participants had moderate to severe stress score level that represent significant psychological stress symptoms, 50 (62%) had mild level of psychological stress therefore less significant psychological stress symptoms.

Table 6: Frequency of Nurses' Behavioral change response to stress

	Frequency	Percentage
0 -1 Mild	60	75%
2 Moderate	16	20%
3 and above – Severe	4	5%

Table 6 indicate that 20 (25%) of the participants had moderate to severe stress score level that represent significant behavioral change, 60 (75%) had mild level of behavioral change and therefore less significant behavioral change.

4.4 Relationship between stress and stressors

Table7: Physical stress

Stressors	Sum of Squires	Mean Squires	F-ratio	P – value
ICU physical environment.	1.71	1.74	0.78	0.38
Work load demand/and R.	0.42	0.42	0.19	0.67
Management Issues	14.97	14.97	7.25	0.01
Personal characteristics	7.15	7.15	3.30	0.07
Interpersonal Relationship	8.93	8.93	4.17	0.05

The results on factors associated with stress showed no association between ICU physical environment and physical stress as evidenced by p-value = 0.38. There was also no association between work load demands and resources and physical stress response having p-value = 0.67. But management issues and interpersonal relationship (nurse /nurse, nurse/doctor conflicts) had relationship with physical stress response as evidenced by their p – values 0.01, and 0.05 respectively.

Table 8: Psychological stress

Stressors	Sum of Squires	Mean Squires	F- ratio	P – value
ICU environment.	0.01	0.01	0.01	0.94
Work load demands/ and R.	2.82	2.82	1.94	0.17
Management Issues	1.49	1.49	1.02	0.32
Personal characteristics	6.40	6.40	4.56	0.04
Interpersonal Relationship	5.89	5.89	4.17	0.04

Psychological stress had no association with ICU physical environment, workload and management issues with p-values 0.94, 0.17and 0.32 respectively. Interpersonal relationship and personal characteristics were the factors associated with psychological stress response. As indicated by their p- values of 0.04 in both factors.

Table 9: Behavioral change

Stressors	**Sum of Squires**	**Mean Squires**	**F-ratio**	**P – value**
ICU environment	0.01	0.01	0.01	0.92
Workload demands/and R.	0.27	0.27	0.32	0.58
Management Issues	1.32	1.32	1.58	0.21
Personal characteristics	2.33	2.33	2.84	0.1
Interpersonal Relationship	0.37	0.37	0.43	0.5

In the table of relationship between stressors and behavioral change, there is no association between ICU physical environments, workload, management issues, personal characteristics, and interpersonal relationship with behavioral change as evidenced by the p-values greater than 0.05.

CHAPTER 5: DISCUSSION

The discussion of the results in this study has two sections. Section one is about stress symptoms experienced by ICU nurses in six months including the month of the study and section two is about factors related to stress.

Experienced stress symptoms by ICU nurses

The results of this study indicate that the prevalence of stress among nurses in ICUs, MNH is moderate for physical stress and mild for psychological stress and behavioral change. This may be due to the fact that it was easy for the nurses to report physical symptoms than psychological and behavioral symptoms. The taboo of inherited fear of disclosing mistakes may also contribute because psychological stress and behavior change are more related to doing errors or mistakes at work. However the study findings differ from those of (Raja et al., 2007) that had high prevalence of ICU nurses stress in all three categories. This difference may be due to higher technological advancement and public awareness of Malaysia compared to Tanzania. The three categories of stress symptoms investigated in this study comprising of physical, psychological and changes in behavior are worth noting although psychological stress symptoms like poor concentration at work, irritability, guilty, and fatigue, and behavioral changes like (did errors, had conflict with colleagues and absenteeism) were found to be mild. These results are consistent with the study findings of (Mims & Stanford 2004) who found that ICU nurses reported low – medium levels of depersonalization (mistreating recipients of their care – behavioral change).

Factors associated with stress

This section discusses the factors associated with stress as presented in this study; starting with

Personal characteristics:

The fact that majority of the nurses with significant stress symptoms in this study were aged below 35 years implies that nurses in this age group are likely to be stressed more because of less work experience, immaturity and perhaps most staff members in this age group are not yet settled socially and economically as compared to the other group. This finding coincides with that in the study done by (Jennings, 2008). In contrasts a study done by (Koivula et al., 2000) found that, health providers with less than 35 years of age are less stressed than those with 35 and above years. Although gender had no relationship with stress level in this study, study findings by (Jennings, 2008) showed that female health personnel are more stressed than males. Similarly, marital status in this study shows no relationship with stress. This is opposite to the study findings by (Jennings, 2008) & (Thorsen et al., 2011) that indicated married nurses are more stressed compared to nurses with no bond.

Work experience and level of education was found to have no association with stress in this study. On the contrary (Al-Turki et al., 2010); & (Raja et al., 2007) found that work experience had significant association with stress; that nurses with less work experience are more stressed compared to those with work experience. The level of education (designation) in this study has been categorized into nurses and nurse officers (assistant nurse officers, nurses with bachelor and nurse specialists). Twenty four nurse officers found to have significant stress symptoms while only one of the certificate nurses found to have significant stress symptoms, implying that the more educated the nurses are the more responsibilities as compared to less educated. On the contrary the study results found by (Mbuthia, 2009) in Kenya show no relationship between level of education and stress. Nurses with bachelors and nurse specialists at MNH are potential for work stress because of the organizational expectations put on them which, most of the time is hard to meet due to inadequacy of efficient equipments, shortage and poorly designed ICUs.

Dealing with machines that support patient breathing and infusion pumps as part of education was found to be related to significant stress symptoms. This reflects the less confidence of the ICU nurses in this area. These findings are consistent with the study findings of (Lee et al., 2011) and (Raja et al., 2007) and stress the importance of formal ICU training for nurse students and the need for post basic ICU course initiation in our country.

In this study, ICU training has no relationship with stress which is not the same as the findings in the study done by (Raja et al., 2007). Raja and others found that nurses received formal ICU training were less stressed compared to those received no formal ICU training. However, personal characteristics as a factor was insufficiently examined because the researcher did not consider other important aspects like, being open minded, being scared of speaking up, being confident, and being afraid of not being good enough and that can be a limitation to that decision. General implication on personal characteristics as a factor related to stress is, different people or cultures may have different perception to stress.

Interpersonal conflict

Interpersonal conflict was found to have significant influence to the prevalence of stress among ICU nurses at MNH. Similarly the studies done by (Bakker et al., 2005; Curtis & Kathleen, 2007; Jennings, 2008; McCarthy et al., 2010; Poncet et al., 2007) had revealed this influence. Thus interpersonal conflict has taken the lead as a factor for nurses' stress because it has been mentioned in most of the studies. Clear work practices and policies, for both the physicians and nurses, can help reduce conflict among health workers.

Management issues

Management issues were also found to have association with stress. Similarly previous studies by Mims and Stanford (no date); (Jennings, 2008); (McCarthy et al., 2010) (Poncet et al., 2007); & (Bennett et al., 2001) had shown relationship between management issues and stress. Moreover, during data collection these issue rose as a concern when most of certificate nurses complained of having working efforts no matter

the non friendly working environment without recognition (i.e. they are rarely given opportunities for professional development seminars and workshops); They said, they were told that they had to upgrade themselves to get such chances. So for them this decreased their morale to work. This point prompted the researcher to think of a need for a kind of study with mixed methods in which the qualitative phase would explore much of the factors that lead to stress among ICU nurses.

Lack of job description may also be additional factor contributing to high levels of stress to the nurse officers and nurse specialists; where most of the time they find themselves transferring patients to the wards, empty urine, bath patients, calling other paramedics who under normal circumstance would have to be around all the time. Continuous exposure to this condition may cause physical and emotional exhaustion and reduced interest to work (Mbuthia, 2009). Clearly, there is a necessity of ICU nurses to use the scientific aspect of their training to prioritize their roles in meeting the patients' needs.

ICU environment

In this study, ICU physical environment did not show significant association with stress. On the contrary, a study done by (Poncet et al., 2007; Bakker et al., 2005 and Preto & Padrao 2009) found different results that shows association between ICU environment and stress. Since ICU physical environment is not a problem for ICU nurses at MNH and only few studies has shown association with stress, the researcher has no suggestion about that.

Workload in this study has not shown association with stress implying that work load is not a problem for ICU nurses at MNH which can either be due to good coping skills or periodically less work overload at MNH in the sense that perhaps during data collection and the past six months workload was manageable. This is opposite to the study findings b**y** (Poncet et al., 2007); (Bakker et al., 2005) and (McCarthy et al., 2010).

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION

ICU nurses at MNH suffer moderate physical stress, mild psychological stress and mild behavioral change. Significant stress symptoms were physical stress symptoms which include (back pain, headache, chest pain, stomach upset and sudden weight gain/loss). The factors found to be associated with stress were poor interpersonal relationship, personal characteristics and management issues. However, this study is prone to recall bias because the participants were needed to recall the symptoms of stress they experienced in six months time from the time of data collection. Selection bias was also a limitation to this study because the researcher used convenient sampling to get the participants. Also, information bias might have occurred during modifications and development of the tool and interpretation of the results. Therefore, there is a need for further investigation using other methodological approaches.

Implication

Hospital management has an important role to play in preventing and reducing the stress levels of nurses working in ICU as stress has an effect on job performance and quality of nursing care.

6.2 RECOMMENDATIONS

Nurses need to learn effective stress coping mechanisms like how to position themselves on turning or lifting patients.

The MNH has to look for possibilities to get enough and durable efficient adjustable beds to lessen nurses' muscle straining, and efforts to raise staffing requirements since physical stress symptoms are the most significant.

Also good communication skills and interpersonal interaction that are potent for team work building should be encouraged.

The researcher recommends for future studies which will include what coping mechanisms the nurses apply to manage physical stress; qualitative method may yield detailed information.

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APPENDICES

CONSENT FORM

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES

DIRECTORATE OF RESEARCH AND PUBLICATIONS, MUHAS

ID-NO | | | | | | | | | | |

Consent to participate in a project about; prevalence of stress among nurses working in Intensive Care Units (ICU) at Muhimbili National Hospital (MNH).

Greetings! My name is Mkiga Mohamed Salama. I am a student nurse working on a research project with the objective of identifying prevalence of stress and factors associated with stress among nurses working in ICUs Muhimbili National Hospital.

Purpose of the Study

The purpose of conducting the study is to determine prevalence of significant stress symptoms and factors associated with significant stress symptoms among nurses working in ICUs MNH. This will help in raising awareness of nurses, management and the MOHSW on the prevalence of stress among ICU nurses at MNH; so that strategies to minimize and prevent stress can be sought and promote nurses' health, job performance and quality of nursing care.

What Participation Involves

If you agree to join the study, you will be asked to answer about 31 questions. The questions ask about demographics, stress related symptoms and factors associated with stress symptoms. It will take about 20 to 30 minutes to complete the questionnaire.

Confidentiality

All information we collect on forms will be entered into computers with only the study identification number. All information that will be collected from you will be protected. The study will not include details that directly identify you, such as your name. Only a participant identification number will be used in the questionnaire. Only the researcher and the supervisors will have direct access to the completed questionnaires. If this study is published or presented at a scientific meeting, names and other information that might identify you will not be used.

Risks

We do not expect that any harm will happen to you because of joining this study.

Rights to Withdraw and Alternatives

Taking part in this study is completely your choice. You are free to skip any question if you feel uncomfortable to disclose information. If you choose not to participate in the study or if you decide to stop participating in the study there is no any penalty. You can stop participating in this study at any time, even if you have already given your consent.

Benefits

There are no direct benefits to you. However if you agree to participate in this study, your contribution will be useful in formulating recommendations on strategies to minimize and prevent stress among ICU nurses and promote nurses' health, job performance and quality of nursing care.

In Case of Injury

We do not anticipate that any harm will occur to you.

Who to Contact

If you ever have questions about this study, you should contact the study Researcher Salama M. Mkiga, RN (0713 143941) Muhimbili University of Health and Allied

Sciences, P.O. Box 65004, Dar es Salaam). If you ever have questions about your rights as a participant, you may call the Principle Investigator or Prof. M. Aboud, Director of Research and Publications at MUHAS, P.O. Box 65001, Dar es Salaam. Tel: 2150302-6.

Signature:

Do you agree to participate?

Participant agrees …… Participant does NOT agree ……..

I, _____ have read the contents in this form. My questions have been answered. I agree to participate in this study.

Signature of participant _____

Signature of witness (if person/caretaker cannot read) _____

Signature of researcher _____Date_____

QUESTIONNARE

QUESTIONNAIRE FOR NURSES (ICU) (ENGLISH VERSION)

SECTION A: SOCIO-DEMOGRAPHIC DATA (PERSONAL CHARACTERISTICS)

SN……..

We would appreciate it if you could answer the following questions as accurately as possible.

Tick what is appropriate

1. Your age ranges i) 25 – 34 ii) 35 – 44 iii) 45 and above.

2. Gender [M] [F]

3. Marital status [Married] [Single] [Widowed] [Separated] [Cohabiting]

4.Designation

i) Nurse

ii) Assistant Nurse Officer

iii) Nurse Officer

iv) Nurse specialist

5. Attained formal ICU training [YES] [NO]

6.Years of working in ICU.

a) Less than 1 year, b) 1–3, c) 4–6, d) 7–9, e) 10 years and above.

SECTION B

The following are the symptoms of stress

Tick YES for the symptom you have experienced and NO for what you haven't experienced in the past 6 months.

7. Headache when you are at workplace

YES NO

8. Back pain

YES NO

9. Chest pain

YES NO

10. Stomach upset

YES NO

11. Sudden weight gain/loss

YES NO

12. Poor concentration at work

YES NO

13. Getting angry easily

YES NO

14. Feeling sorry for yourself being a nurse

YES NO

15. Feeling tired even with no significant work

YES NO

16. Potential for committing errors/mistakes

YES NO

17. Conflict with colleagues/patient or relatives

YES NO

18. Have you been out of work place in the past 6 months?

YES NO

19. Yes; the reason was……..

SECTION C

Normally nurses working in ICU are continuously exposed to stressors; which of the following factors make you uncomfortable in your unit.

Tick YES for the situation that makes you feel uncomfortable and NO for that makes you feel comfortable.

ICU ENVIRONMENT

20. Machines and the alarms

YES NO

21. Cold conditions

YES NO

WORK LOAD DEMAND AND RESOURCES

22. Caring for a critical ill patient (Caring for a ventilated patient)

YES NO

23. Caring for a dying patient (resuscitation)

YES NO

MANAGEMENT ISSUES

24. Caring more than one patient alone (staff shortage)

YES NO

25. Tracing of other paramedics (poor organization)

YES NO

26. Long shift (staff shortage)

YES NO

27. Lack of identified/recognized job description

YES NO

INTERPERSONAL RELATIONSHIP

28. Working in the presence of doctors/consultants and administrators

YES NO

PERSONAL CHARACTERISTICS

29. Working as a team leader (confidence and knowledge)

YES NO

30. Performing or preparing a sterile procedure like dressing, ETT suctioning, bronchoscope

and CVP/AL insertion. (Knowledge and confidence)

YES NO

31. Dealing with machines that support patient breathing and others for hemodynamic monitoring.(knowledge)

YES NO

Thank you for your participation. We assure you that all information provided will be treated with strict confidentiality.

5.3. DODOSO KWA AJILI YA WAUGUZI WA WAGONJWA MAUTUTI

SEHEMU A TAARIFA BINAFSI

NAMBA YA DODOSO……..

Itakuwa vizuri sana ukijibu maswali yafuatayo kwa usahihi iwezekanavyo.

Tiki jibu sahihi

1. Umri wako ni kati ya miaka i) 25 – 34 ii) 35 – 44 iii) 45 au zaidi.

2. Jinsia ☐ mume ☐ mke

3. Marital status ☐ Nina ndoa ☐ Sina ndoa ☐ Tumetengana ☐ nimefiwa ☐ tunaishi kinyumba

4. Cheo
   i) Muuguzi
   ii) Afisa muuguzi Msaidizi
   iii) Afisa Muuguzi
   iv) Muuguzi Mtaalam

5. Ulifundishwa darasani jinsi ya kuuguza wagonjwa maututi, vifaa muhimu katika wodi hiyo na jinsi ya kuvitumua? ☐ Ndio ☐ Hapana

6. Umefanya kazi wodi ya wagonjwa maututi kwa muda gani sasa
   a) Chini ya mwaka 1, b) miaka 1–3, c) miaka 4–6, d) miaka 7–9, e) miaka 10 au zaidi.

SEHEMU B

Zifuatazo ni dalili za matatizo ya kiafya ambazo muuguzi wa wagonjwa maututi anaweza kupata Tiki ndio kwa dalili ambayo imeshakusumbua au inakusumbua na hapana kwa ambayo haija kusumbua ndani ya miezi 6 hii.

7. Maumivu ya Kichwa ukiwa kazini

   Ndio Hapana

8. Maumivu ya Mgongo

   Ndio Hapana

9. Maumivu ya Kifua

   Ndio Hapana

10. Mchafuko wa tumbo

    Ndio Hapana

11. Kuongezeka au kupungua uzito ghafla

    Ndio Hapana

12. Kuhisi kukosa utulivu wa akili ukiwa kazini.

    Ndio Hapana

13. kukasirika haraka na kwa kitu kidogo

    Ndio Hapana

14. kujuta kuwa muuguzi

    Ndio Hapana

15. kuchoka bila kufanya kazi.

    Ndio hapana

16. kusahau kutoa taarifa muhimu kuhusu mwendelezo wa matibabu ya mgonjwa kwa wakati stahili.

Ndio Hapana

17. Kukorofishana na mfanya kazi mwenzio au ndugu wa mgonjwa

Ndio Hapana

18. Imeshatokea hukuwa katika eneo la kazi muda wa kazi ndani ya miezi 6 hii?

Ndio Hapana

19. Kama ndio sababu ni nini? ……..

SEHEMU C

Kwa kawaida wauguzi wa wagonjwa maututi daima wanakabiliwa na msongo au shiniki zo kiakili na kimwili ambao wakati mwingine huathiri mwenendo na utendaji wa kazi. Ni yapi katika mambo yafuatayo yanakufanya ujisikie vibaya/tafrani ukiwa katika mazingira ya kazi.

Tiki NDIO kwa linalokufanya ujisikie vibaya na HAPANA kwa ambalo halikusumbui.

20. Kuona mashine mbalimbali zinazotumika katika matibabu ya wagonjwa.

Ndio Hapana

21. Hali ya ubaridi wodini

Ndio Hapana

22. Kuhudumia wagonjwa maututi

Ndio Hapana

23. Kuhudumia mgonjwa ambaye anakufa na ndugu zake

Ndio Hapana

24. Kuwatafuta waudumu wa afya pale inapotokea wanahitajika; mfano mtu wa picha (x –

ray), daktari wa zamu.

Ndio Hapana

25. Kuhudumia zaidi ya mgonjwa mmoja

Hapana Hapana

26. Kufanya kazi kwa masaa 12 kwa siku

Ndio Hapana

27. kukosekana kwa mipaka ya kazi inayoeleweka (identified/recognized job description)

Ndio Hapana

28. Kufanya kazi huku madaktari au viongozi wapo wodini.

Ndio Hapana

29. Kufanya kazi kama kiongozi wa zamu wodini (as a team leader)

Ndio Hapana

30. Kuhudumia mgonjwa anayesaidiwa kupumua kwa mashine na moyo ukisaidiwa na dawa.

Ndio Hapana

31. Kumfanyia au kuandaa huduma inayohitaji umakini kuzuia kustawi kwa vijidudu na mwendelezo wa maradhi kwa mgonjwa; kama kufunga kidonda na kusafisha njia ya hewa

Ndio Hapana

Ahsante kwa ushirikiano wako. Tunakuhakikishia kwamba taarifa ulizo zitoa hazitamfikia yeyote zaidi ya mtafiti.

Appendix II: Ethical clearance letter

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
DIRECTORATE OF POSTGRADUATE STUDIES

P.O. Box 65001
DAR-ES-SALAAM
TANZANIA
Telefax: 255-022-2150465
Telegrams: UNIVMED

E-MAIL dpgs@muhas.ac.tz
TEL: (255-022)-2150302-6 Ext. 207
Direct line: 2151378

Ref. No. MU/PGS/SAEC/Vol. VI/

20th July, 2012

Mkinga Salama Mohamed,
MSc.Critical Care and Trauma Nursing.
MUHAS.

RE: APPROVAL OF ETHICAL CLEARANCE FOR A STUDY TITLED "PREVALENCE OF STRESS AMONG NURSES WORKING IN INTENSIVE CARE UNIT OF MUHIMBILI NATIONAL HOSPITAL DAR ES SALAAM, TANZANIA"

Reference is made to the above heading.

I am pleased to inform you that, the Chairman has on behalf of the Senate approved ethical clearance for the above-mentioned study.

Thus ethical clearance is granted and you may proceed with the planned study.

Please liaise with bursar's office to get your research fund.

Prof. Z. Premji
DIRECTOR, POSTGRADUATE STUDIES

/emm

c.c. Vice Chancellor, MUHAS
c.c. Deputy Vice Chancellor – ARC, MUHAS
c.c. Dean, School of Nursing - MUHAS

Appendix III: Permission letter for conducting the study at MNH

MUHIMBILI NATIONAL HOSPITAL

Cables: "MUHIMBILI"
Telephones: 255-22-2151367-9
FAX: 255-22-2150234
Web: www.mnh.or.tz

Postal Address:
P.O. Box 65000
DAR ES SALAAM
Tanzania

In reply please quote:
Ref:

31st July 2012

TO WHOM IT MAY CONCERN
MUHIMBILI NATIONAL HOSPITAL

RE: RESEARCH CLEARANCE NO 227 2012/2013

Name of Researcher	**SALAMA MOHAMED MKIGA**
Research Title	PREVALENCE OF STTRESS AMONG NURSES WORKING IN INTENSIVE CARE UNITS OF MUHIMBILI NATIONAL HOSPITAL DAR-ES-SALAAM, TANZANIA
Type of Research	DESCRIPTIVE CROSSSECTIONAL STUDY CONDUCTED AT GENERAL ICU, HIGH DEPENDENT UNIT, PAEDIATRIC ICU, CARDIAC ICU AND EMD
Valid Between	**JULY 2012 TO DEC 2012**

The above named has been allowed to conduct the stated research.

Please accord him/her and his/her assistants the necessary assistance/cooperation.

Sincerely,

Dr. H.F. Swai
DIRECTOR OF MEDICAL SERVICES

DIRECTOR OF CLINICAL SERVICES
P. O. Box 65000
DAR ES SALAAM
MUHIMBILI NATIONAL HOSPITAL