

**ADAPTATION OF STRESS MANAGEMENT MODEL FOR STUDENTS
STUDYING IN SELECTED SCHOOLS OF NURSING IN RWANDA**

NYIRAHABIMANA CHRISTINE

**A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE
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DEGREE IN NURSING OF
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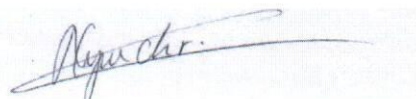
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Signature:



Date: July 2nd, 2024.

Christine Nyirahabimana

PhD NS/47028/2016

Approval by the Supervisors

This thesis has been submitted with our approval as the Mount Kenya University Supervisors.

Signature:

Date: July 2nd, 2024.

Doctor Connie Mureithi,

PhD Mount Kenya University

Signature:



Date: July 2nd, 2024.

Doctor Rosemary Okova,

PhD Mount Kenya University

DEDICATION

This research is the product of efforts from many persons under the blessings of God Almighty. It is dedicated to my parents, husband, and daughters.



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ABSTRACT

Stress among students is mainly caused by balancing school schedules, preparing for and taking exams. Individual life with the requirements of school are all possible stressors in a student's life. Nursing students are not exceptional; they also have similar demands that lead to rigorous course load and clinical competency requirements. The main objective of this study is to adapt a model of stress management for students attending selected nursing schools in Rwanda, while specific objectives are: 1) to determine the socio demographic characteristics of students studying in selected schools of nursing in Rwanda, 2) to assess the level of stress of students studying in selected schools of nursing in Rwanda, 3) to identify the stressors of students studying in selected schools of nursing in Rwanda, 4) to determine the coping mechanisms of students studying in selected schools of nursing in Rwanda, 5) to explore the knowledge of students studying in selected nursing schools in Rwanda about stress, 6) to adapt a model of stress management for students studying in selected nursing schools in Rwanda. A cross-sectional descriptive study design using mixed method (both quantitative and qualitative approaches) has been used in this study. The stratified sampling technique was used to choose 384 nursing students who completed the questionnaires, 59 students' members of 6 focused groups' interview were selected using convenience sampling technique, and purposive sampling technique was used to choose two key informants from each institution. Analysis of quantitative data was done using software of SPSS version 23. For inferential statistics, we have used Chi Square Test, correlation, and linear regression. Results indicate that nursing students experience stress while at schools: only 63.2% of respondents scored a low level of stress while, 23.9% of participants scored moderate level of stress, and 12.7% scored a high to very high levels of stress. About coping mechanisms, 44% of respondents do not always use the positive coping mechanisms, but use them sometimes, compared to 25% who uses them often, and 30.9% who never use positive coping mechanisms. In relation to stressors, 22% of respondents ranked exams as the first stressor, followed by financial issues (21%), and academic workload (18%). The above data are supported by the qualitative data from FGDs and KIIs. The Stress Management Model for nursing students in Rwanda was successfully adapted based on the existing theory stated as "Transactional Model" of Dr Richard Lazarus and Dr Suzan Folkman (1984) and it has 4 major concepts namely stress, appraisal, coping and reinforcement. The adapted model for stress management among nursing students studying in some selected nursing schools was validated by a team of experts in nursing profession and then tested among 39 nursing students of UR- Huye Campus (representing 10% of participants in the main study). Nursing students who participated in the model testing showed a high level of enthusiasm about the model of stress management. This study will benefit many people since it will be a tool showing how to manage stress among students at nursing schools of Rwanda.

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LIST OF ABBREVIATIONS AND ACRONYMS

APA	: American Psychological Association
CBI	: Coping Behaviour Inventory
Dr.	: Doctor
FGD	: Focused Group Discussion
HoD	: Head of Department
RHIH	: Ruli Higher Institute of Health
MKU	: Mount Kenya University
MKUR	: Mount Kenya University / Rwanda
NPR	: National Public Radio
NRECC	: National Research Ethics and Consultancy Committee
PhD	: Doctor of Philosophy
PSS	: Perceived Stress Scale
PTSD	: Post Traumatic Stress Disorder
TV	: Television
UR	: University of Rwanda
USA	: United States of America

DEFINITION OF KEY TERMS

Here, the researcher explains how certain terms have been used in a special way in the context of the study to facilitate the reader to understand well the content of this study.

Stress - In relation to this study, stress is considered as sensation of physical or / and emotional pressure. It may be caused by any event or thought which makes a person to feel upset, irritated, or anxious. Short term stress can be positive, as it may help in avoiding threat or meet a deadline. But a prolonged stress may produce life threatening complications.

Stressors - Stressors are explained as negative situations (for examples: the loss of a job, divorce, death of a loved one, etc.). Also, positive changes in life (birth, moving, marriage, new responsibility, new environment, etc.) may also be considered as stressors, and then, requesting the adaptation by applying the stress coping measures. Specifically, for nursing students in this study, stressors can include unfamiliar situation in caring for clients, stress from clinical instructors and staff nurses, heavy academic and clinical works, stress from colleagues and everyday life, deficiency of competencies required by the profession and unfamiliarity with equipment and tools found in clinical settings.

Stress level - Taking into consideration this study, the specific and validated tool that is: PSS was used to estimate the levels of stress experienced by nurse students. The tool consists of 15 items and the related possible answers range from “rarely” to “often” and are scored from 1to5. A lower score corresponds to lower degree of stress and the higher score corresponds to higher level of stress. The potential levels of stress are low, moderate, high and very high.

Coping mechanism - In the context of this study, coping mechanism refers to the measures of controlling external or internal request that are recognized as

exceeding individual possessions.

Higher institutions in Rwanda - In this study, Rwandan higher institutions include public and private institutions training nursing students: University of Rwanda (UR) and its campuses, University of Gitwe (UG), Mount Kenya University, Rwanda (MKUR), Ruli Health Institute of Health (RHIH), Kibogora Polytechnique and Adventist University of Central Africa (AUCA).



CHAPTER ONE: INTRODUCTION

1.0 Introduction

This chapter gives in details the background of the study, problem statement, general and specific objectives of study, research questions, significance of the study, limitations, the scope of the study, and organization of the study.

1.1 Background to the study

According to the World Health Organization, “stress is defined as any type of change that causes physical, emotional, or psychological strain. Stress is your body's response to anything that requires attention or action. Everyone experiences stress to some degree. The way you respond to stress, however, makes a big difference to your overall well-being. Everyone reacts differently to stressful situations. Accordingly, both the impact of stress and the coping styles can vary from person to person” (World Health Organization, 2021). Psychological stress is a sensation of emotional or bodily pressure. That kind of stress may originate from any incident or thought making you upset, irritated, or panicky. It is your response to a problem or request. In short terms, psychological stress may be considered as helpful; for example, in case it assists one to overcome the dangerous situation or to respond the demands respecting the time limit. Nevertheless, if psychological stress persists, it is absolutely cause of serious impairment to one’s health (MedlinePlus, 2022).

In the year of 2022, the American Psychological Association (APA) put out its report in which psychological stress was assessed in general population. The reported data reveal that due to COVID- 19, the lifestyle of many persons changed in 2020, and thus, many individuals became more stressed. The above-mentioned disease affected people in different ways and at different levels. The related psychological strain affected people of different age, children, youth, and adults. This report was released in October 2022,

and it displays an abused psyche in America, fronting a barrage of outside causes of psychological stress which were in most cases out of individuals' control (American Psychological Association, 2022).

As above mentioned, psychological stress is not always harmful to one's health, and it may be seen as beneficial. Sometimes, it may assist people overcoming unsafe circumstances. For instance, if someone has the academic or job deadline, the short time psychological stress may help the body to produce the enough energy to work during day and night-time and submit the required assignment or work at the right time. After submitting the required assignment or work at the right time, that psychological pressure reduces and goes away. In other hands, psychological stress which takes a long period of time is very dangerous and finally leads to the serious health problems (MedlinePlus, 2022). Research demonstrates that stress refers to physic - psychological response to the request of environment happening if individuals realise that it is not possible to adequately cope with that request (Lewis & Shaw, 2014). Worldwide, everyone is candidate and can be affected by psychological stress. This can lead to the consequences on the overall health individuals. They may show numerous health complications like heart problems which may include high blood pressure and so on... (World Health Organization, 2021)

For understanding youth and especially academic stress, we should first have an understanding on real meaning of "stress". Atlantic University gives the definition of psychological stress as follows "stress refers to a distressed state of mind caused by various factors. Mental stress manifests differently based on the person or level of stress". After having clarification on what "stress" is, it is now easy to recognise the meaning of psychological stress experienced by university students. Atlantic University defines the academic stress in the following proper terms, "Academic stress refers to the

kind of psychological distress caused by factors pertaining to one's academic performance. The stressors that cause academic stress vary depending on the student, but they all have in common the fear of failure in some way or another" (Atlantic University, 2022).

As the problems of lifetime increase, the prevalence of psychological stress is growing too in general population especially among the young generations. Reason why, it is helpful to avail different programs to improve their knowledge on stress, its causes, risk factors, complications, and preventive measures. In its report of 2022, American Psychological Association revealed that more than 50% of habitants of America responded to have psychological stress due to changes related to lifestyles (American Psychological Association, 2022). In relation to the culture of competition, Atlantic University conducted research among university students and findings showed that currently the young people live with different levels of psychological stress. One of respondents said "we now live in a time when people are more worried than relaxed. There is never enough time due to tremendous competition in every facet of life. This results in a high level of worry, mental strain, and, of course, displeasure and stress" (Atlantic University, 2022).

In other hands, Thomas stated that the psychological stressors from workplaces may also be higher than those from schools or universities. He continued saying that students may attain the highest academic rankings, and that does not give them assurance of getting jobs. Even if they get job, other factors like payment, promotion, getting marriage and others may stress them (Thomas, 2022). MedlinePlus added that sleeplessness due to extreme utilisation of technology materials has negative impact on the overall health of present population and the life in general. The typical example given by MedlinePlus is stated as follows "people's eyesight has deteriorated since they

were children due to prolonged exposure of the naked eye to the screens of electronic devices. Overuse of electronics causes anxiety because people forget to look up from their phones and appreciate nature and its wonderful beauty” (MedlinePlus, 2022).

In his research, Thomas found special stressors for university students such as multiple duties, inadequate time management, variations in patterns of eating, drinking, and sleeping, and lack of time and sometimes means for self-care. More specifically, new students of first year may express psychological stress as they are in transitional period to the academic life and its new contacts and responsibilities. If psychological stress is not well managed, it may have serious physiological complications like lack of concentration in cognitive activities, inadequate social relationship, excessive tiredness, lack of appetite or excessive appetite, a weak immune system, insomnia and others (Thomas, 2022). Stress is a situation producing negative feelings in individuals. Living in College or University environment can be among the interesting moments of one’s life. However, new contacts, new places, new challenges, relationship problem, financial worries, and burden of course work, and exam pressure can make the students’ life stress full. The students experience the effect of stress at some point in their learning process and a small number of them may usually suffer from chronic stress (American College Health Association, 2017).

In 2018, Reddy and his colleagues conducted a study on academic stress, and its sources among university students. Their findings revealed that university students experience more psychological stress than ever and for prolonged period of time. They found that most of time, academic stress comes from increased workload, and other matters, like as families, colleagues, and job, can rise stress and lead to unwanted university and individual results (Reddy, K.J.; Menon, K.R. & Thattil, A., 2018). Fortunately, World Health Organization states different tips to manage stress for staying stress-free. Those

tips are consistent physical exercises, spending enough time with loved persons, contribute actively to public activities and other relaxation events. The level of psychological stress varies from one person to another and depends on our temperament and how we respond to the changing situations. One person may be flexible in letting disturbing situations go away. In other hands, some people are not flexible and always remain attached to disturbing situations which cause to prolonged stress to them (World Health Organization, 2021).

According to MedlinePlus, there are simple tips to implement for successful stress management and those tips are stated as follows “a 30-minute daily walk can help you feel better and help keep your immune system strong, so you don't get sick. Try relaxing activities: you could look for an app or wellness program that uses breathing, meditation, or muscle relaxation exercises. Get enough sleep every night, avoid too much caffeine, decide what you need to do now and what can wait, and focus on what you got done each day, not on what you weren't able to do. Also, ask your family or friends for support” (MedlinePlus, 2022).

Worldwide, stress has been assessed among nursing students. Indira and Meena (2014) studied the possible causes of stress among 120 nursing students attending selected colleges, their study results revealed that clinical issues were the most identified stressors to nursing students, followed by academics matters, whereas personal issues did not produce much stress for the participants. For example, 52.1% of participants answered that attending day classes following a night of clinical duty was the most stressful, and 31.09% responded that in academic are, the biggest stressor was the massive number of assignments, in relation to personal stressors, inadequate free time was most stressful, as reported by respondents at 64.71%. Basing on their findings, Indira and Meena strongly suggested that nursing schools should create conducive

learning atmosphere that facilitate learners to manage stress (Indira & Meena, 2014).

In the same line, Acharya & Chalise (2012) in their study, they estimated the level of self-esteem and academic stress of nurse students attending Kathmandu University. In that cross-sectional study, 190 learners were selected. The study findings showed that about 78% of respondents exhibited low Self-esteem and among them 74% had high academic stress. From those results, it was recommended that the program to reduce the stress related to academic issues and improve the students 'self-esteem should be introduced to ameliorate the teaching and learning process (Acharya & Chalise, 2012). Furthermore, in China, a study conducted by Ming et al. (2014) was designed for investigating the stress experienced in clinical setting by Macao nurse students, in that cross-sectional study, 203 learners were selected as study participants. Regarding the stressors, the researchers found that four were belonging to the clinical attachments, four to the academic aspect, and one to the financial issues, therefore the investigators suggested that the nurse students' workload should be taken into consideration during nursing curriculum review (Ming et al. 2014).

Nursing is a practical profession that requires both practical and theoretical proficiencies in clinical settings. The practice has been proven to advance knowledge and skills among students who study nursing profession, by supporting their ability and efforts to translate theoretical knowledge into practices that aim to improve patient outcomes. There is scientific evidence that supports that to acquire required skills in this profession, problem solving, a sense of professionalism and critical thinking and decision making are required among others (Fernanda, et al, 2020).

Negative experiences in nursing profession can lead to lack of self-esteem and confidence, poor satisfaction and performance. To build much the practical part, clinical and practical placements are arranged for these students in different clinical settings,

including hospitals, clinics, and health centres. Therefore, these students undergone a huge stress in these placements, and may feel more stressed to cope effectively especially on environmental factors, workmate relationships, and work overload. These situations seem to be challenging to these students, and sometimes their capacity or ability to cope are exhausted, leading to chronic stress. However, chronic stress may affect undoubtedly their physical, psychological, emotional, and behavioural life, thus compromising their general wellbeing. This is also considered to be a major risk factor of stress among students studying nursing professions (Baluwa, M.A., 2022).

The current studies have identified higher level of stress among students and the biggest contributor to their well-being and health, but also impair their academic performance and ability to deliver much in their nursing profession. However, in the viewpoints of individual perception, stress may vary depending on individual perception on how to cope and manage stressful situations and events.

Therefore, in nursing profession, it is of paramount importance to consider the academic context in which these students are, for better addressing their needs (Chaabane, S. et al. 2021).

Eventually, students undertaking nursing profession are exposed to a wide range of stressors compared to other students in different disciplines. Coupled with academic stressors, these students face additional stressors such as extreme workload in their training, responsibilities in clinical settings during their placements, and field attachments, tough evaluation combined with accumulation of academic duties among others. In addition, stressing environment may be coupled with the content of the semester in which the student is enrolled. However, the stressing outcome differ to student by student, and may be lesser or higher depending on student cognitive and emotional abilities to manage stress (Baluwa, M.A., 2022).

Different assessments or studies are conducted by depending on the year and the semester in which the students are enrolled. Others may orient their efforts on the program level such as undergraduate or graduate studies in clinical practice. Therefore, the studies have clearly demonstrated that there is a huge difference in terms of stress acquired depending on the above factors. However, this calls a need to continuously advance further researches in terms of what drives these differences (Fernanda, M. S., et al., 2020). Furthermore, the studies in Brazil have demonstrated that there are other factors that were not considered but proved to influence the likelihood of stress. These include marital status, working activity, age of the students, gender, and other socio-demographic factors. However, this study concluded by suggesting further studies on association between socio-demographic factors and stress level, because their results were inconsistent with other international study results. It is apparent that national surveys on stress level among students in nursing profession are more concentrated in Southern regions of Brazil than other parts of the country. And those focused mainly on factors other than socio-cultural and academic contexts, which highlight the need and importance of extending researches on other fields such as sociodemographic and academic characteristics globally, and in different institutions including where placements are conducted (María, D.O. et al., 2020). The recent study showcased that psychological and physical stimulus that are involved in disrupting homeostasis originates from a stress factor, thus the name of stressor. This stimulus either physical or psychological may initiate changes that are denoted as stress response. However, the stressor response starts by preparing the body to respond to the internal or external challenges, thus presentation of physiological responses. Sometimes, if the exposure lasts too long, or is persistent or recurrent, the response may adapt otherwise, with many negative effects such as depression, anxiety, cognitive

impairment, and cardiovascular diseases (Atlantic University, 2022). The recent studies have shown that professionals in medical fields experience increased levels of stressed compared with other professions. In addition, students in nursing and medical practices face higher levels of stress, compared to other disciplines. This is coupled that students in these fields of study face extreme consequences of stress other than groups (Tung, Y.J., et al., 2018). Therefore, it is of paramount importance to start assessing stress level beginning the time when a student starts its internship, to promote his or her physical, mental and emotional health, but also improving his/ her academic performance, and also the quality of its profession in general after graduation and joining clinical practices in clinical settings (María, D.O. et al.,2020).

The subject matter of stress was given consideration overtime in scientific literature and other medical profession documentation as it is nowadays. Most importantly the practical section of the training is believed to bring more stress than others. In this section, lack of practical skills or lower adaptability to skilfully master the technical practices are all perceived as the key stressors in nursing field of education. Other stressors include but not limited to making mistakes in clinical placements, handling emergency cases in emergent situations, and lack of adaptability in specialized clinical units (Fernanda, M. S., et al., 2020). In addition, given that nurse students are normally not considered as same as the registered nurses, may bring some frustrations and stress, thus exposing them to some feeling of lack of confidence, and expose them to some tasks that are not usually done by nurses. Coupled with this, students delay making adaptation specially to build strong work relationships with other health professionals, the rankings observed in hospitals, situations and cultural behavioural of different patients and families (caregivers), complexity of some treatment options may all add up to the existing stressors, thus building more negative effects. Also, nursing students

cohabit with other stressors of the kind that are expected given their status as students, such as those connected to their academic program and their status as nursing students. This is because, in contrast to students in other degree programs, nursing students are in touch with the job market, which necessitates a certain level of responsibility in the wellbeing of their patients, distancing them, at times, from campus life and particularly from the typical social activities that their peers take part in (Tung, Y.J., et al., 2018).

Either lower or moderate levels of stress are able to influence student behaviour in terms of motivating positively or negatively the students' performance. Contrarily, higher levels of stress are known to negatively impact the student's academic performance, thus leading to depression and despair, and therefore affecting students' health and academic level. Although stress might be inevitable among students in nursing discipline, and sometimes difficult to overcome, it is imperative to have adaptable coping mechanism that may help students to improve both their health and academic performances. Therefore, the recent longitudinal studies have demonstrated that stress level may either increase or decrease during academic programs because of behaviour or coping mechanisms that are successful or not (Baluwa, M.A., 2022).

As the recommendations in different studies, the analysis of studies on stress level among nursing student may reflect gender, course, and clinical placement, based on the available literature. Therefore, as different countries have different programs that may also differ by country and programs, these variables must be considered with caution. This is because in some studies, the first year was identified as being the most stressing while for others the third or last year was concluded as the most stressful year due to more clinical practices and placements are to be accomplished. Therefore, as much as reacting to stressors may be different among students, it is the same as when it comes to manage stress. However, problem-solving strategy was identified to be the most

important and successful strategy that can be used to deal with stress among students. Besides, emotional based coping approaches also appear to be effective too (Zheng, et al. 2022).

The existing literature provides that coping mechanisms can be sought as ideas, behaviours and actions undertaken by a person towards adapting his internal and external influences that are believed or perceived as stressful. Studies have demonstrated that these stressful conditions either internal or external affect negatively students' academic performance and their life in general. It is recommended that educational institutions assess all causes and factors that can bring stressing level on high level, and try to minimize, reduce, or avoid them whereas possible. This can be achieved on one hand by formulating program policies and interventions that aim at supporting students' efforts towards academic performance and improved well-being in general (Baluwa, M.A., 2022).

Moreover, although this field of stress and coping strategies was largely investigated in different countries, little to none was sufficiently studied on this subject matter in sub-Saharan African countries. Existing evidence is documented on the available types of stressors among students enrolled in nursing programs, and the types of adaptability, but countries in this regions did not clearly provide levels of stress by country, or by program or by curriculum to inform academic institutions, policy developers, and implementing institutions on the trends of the threat and recommend on remedial strategies, for the best country outcomes (Fernanda, M. S., et al.,2020). Coupled with the known stressors, clinical practices intensify the stress level among students in nursing programs. One can understand a student who use to sit in the class for theoretical sessions, how he or she can feel dealing with patients extremely suffering to die, managing extreme emergencies, and wounded patients. Together with inadequate skills

and knowledge, poor relationships with other clinicians and unfamiliarity with the clinical setting environment may all exaggerate the stress level of these students. Therefore, initial period of clinical placement is observed to be the most stressing period in nursing placements, although students have reported similar patterns in advanced years (Tung, Y.J., et al. 2018).

Yet, students feel more stressed with external factors such as accommodation, financial constraints, as well as classmates' relationships and peer pressures. However, this calls the need to have in place adaptive and coping mechanisms that motivate students to keep being optimistic towards their academic goals and orientations. These strategies are meant to support students alleviate the effects that these stressors may have on their academic performance, but also their well-being in general. Though some studies may have been done in African countries such as the one conducted in Malawi, that identified numerous factors that may lead to stress among students in nursing programs, the aspects of stress, and its level was not fully subjected to investigation. Therefore, there is a strong need to design academic programs that fully support to address students' needs in terms of preventing, controlling and alleviating stressors that students in nursing programs may encounter (Reddy, K.J.; Menon, K.R. & Thattil, A., 2018). Though some factors such as financial issues and level of study are known to influence stress, there is a need to adequately provide the extent to which these factors contribute to the stress levels among students in nursing programs. Therefore, it is worth to note that knowledge and skills of students with regards to stress management is important in terms of preventing students to face stress by managing stressors adequately (Zheng, et al., 2022).

Compared with other countries especially globally, African countries report a considerable number of students who experience elevated levels of stress. This may

be dictated by different contextual factors that are solely encountered in Africa, such as poverty. As for instance, 50% of African countries are categorized below poverty line, and 25% live in extreme poverty, and these situations alone may increase the level of stresses African population including students (Baluwa, M.A., 2022). Similarly, this pattern is coupled with the insufficient resources in many educational institutions and clinical settings in Africa. Again, studies have reported insufficient number of human resources, and inadequate knowledge among available staff, to effectively support students in their clinical practice engagements. This implies higher burden of fear to these students, of acquiring or contracting some of hospital acquired infections such as HIV, tuberculosis, and others (Fernanda, M.S., et al., 2020).

More specifically in East African region, nursing students exhibited challenges they experience, and this may be the sources of stress. Kabimba et al. (2014) conducted descriptive cross-sectional research among undergraduate nursing students at Moi University in Kenya. The study aimed to find out the problems experienced by nursing students during their clinical rotations. The results from this study indicated that the main problems encountered by students included the fear of making clinical errors and almost a half of participants (45%) complained that the time allocated for clinical rotations was inadequate. All these problems/challenges increase stress among nursing students (Kabimba et al., 2014). From global and regional literatures different studies have explored and assessed the level of stress among nursing students and coping strategies, however the researchers could not find any specific stress management model among nursing students. Moreover, in Rwanda, there is no research that has been done on stress among nursing students. This is also a gap. The statistics stated above prompted the researcher to conduct a study to determine stress levels among nursing students and then adapt a model of stress management for learners attending some

selected nursing schools in Rwanda.

1.2 Statement of the problem

Nursing is a demanding profession necessitating good academic competencies (knowledge, attitudes, and skills), dedication to the profession, along with good time management. It also requests the aptitude to stand while on duty, with sleepless nights, cope with death and emergencies, and handle hard situations by staying calm and providing emotional support and care to clients and their families. For that, the nursing students perceive variable amount of personal, academic, and clinical stressors throughout their training (Pulido, Lopez-Zafra & Augusto, 2013). Stress has been found as frequent problem affecting students and prolonged stress leads to negative physical and mental health consequences (American College Health Association, 2017).

Among university students, stress can cause mental health problems, and if not well managed, it may lead to death. Thus, stress needs effective management. Stress management measures include positive attitude, meditation, exercise, diet, rest, and conflict resolution, among others. Successful stress management engages learning to end the risk factors leading to stress (American College Health Association, 2017). A study has been done to compare the levels of stress among students from different professions. It has been found that nurse students experienced higher levels of stress compared to other students enrolled in medical, social work and pharmacy departments. Besides contesting examinations, high workload and other commitments, nurse students identified hospital attachments as their major stressor. Inadequate profession experience, panic related to possibility of making profession errors, complicated clients, anxiety caused by continuous clinical assessments and presentations have been reported as few of the stressors for the nurse students in clinical areas (Gibbons, 2014; Jimenez, Navia-Osorio & Diaz, 2015).

Two different studies have been conducted in the year of 2014 and 2017, in School of nursing at the University of Louisville with the main aim to identify nurse students' stressors. It has been shown that nursing students find clinical placements more stressful in their educational process than the theoretical component (Sheu, et al., 2014; Katrina & Valerie, 2017). Either lower or moderate levels of stress are able to influence student behaviour in terms of motivating positively or negatively the students' performance. Contrarily, higher levels of stress are known to negatively impact the student's academic performance, thus leading to depression and despair, and therefore affecting students' health and academic level. Although stress might be inevitable among students in nursing discipline, and sometimes difficult to overcome, it is imperative to have adaptable coping mechanism that may help students to improve both their health and academic performances (Baluwa, M.A., 2022).

Different studies recommended the analysis of studies on stress level among nursing students reflecting gender, course, and clinical placement, based on the available literature. Therefore, as different countries have different programs that may also differ by country and programs, these variables must be considered with caution. This is because in some studies, the first year was identified as being the most stressing while for others the third or last year was concluded as the most stressful year due to more clinical practices and placements are to be accomplished. Therefore, as much as reacting to stressors may be different among students, it is the same as when it comes to manage stress. However, problem-solving strategy was identified to be the most important and successful strategy that can be used to deal with stress among students. Besides, emotional based coping approaches also appear to be effective too (Zheng, et al. 2022). The related literature provides that coping mechanisms can be sought as ideas, behaviours

and actions undertaken by a person towards adapting his internal and external influences that are believed or perceived as stressful. Studies have demonstrated that these stressful conditions either internal or external affect negatively students' academic performance and their life in general. The recommendations from several studies state that educational institutions assess all causes and factors that can bring stressing level on high level, and try to minimize, reduce, or avoid them whereas possible. This can be achieved on one hand by formulating program policies and interventions that aim at supporting students' efforts towards academic performance and improved well-being in general (Baluwa, M.A., 2022). For the case of Rwanda, there is no research that has been done in relation to stress among nursing students, and the present study aims to determine stress levels among nursing students and subsequently adapt a model of stress management for students studying in some selected schools of Nursing in Rwanda. The model adaptation was based on the existing Stress, Appraisal, and Coping theory of Lazarus and Folkman. This theory is considered to be appropriate in adaptation of the model of stress management for students studying in selected schools of Nursing in Rwanda, as it describes the features of effective stress management program. It clearly states that, a stress management program could only be considered as efficient, once person's skill to lessen stressor is well evaluated, the related factors considered.

1.3 Objectives of the study

1.3.1 Broad objective

The overall objective of this research is to adapt a model of stress management for students studying in some selected schools of nursing in Rwanda.

1.3.2 Specific objectives

- i. To determine the socio demographic characteristics of students studying in selected schools of nursing in Rwanda
- ii. To assess the level of stress of students studying in selected schools of nursing in Rwanda
- iii. To identify the stressors of students studying in selected schools of nursing in Rwanda
- iv. To determine the coping mechanisms of students studying in selected schools of nursing in Rwanda.
- v. To explore the knowledge of students studying in selected nursing schools in Rwanda about stress management measures and complications of stress.
- vi. To adapt a model of stress management for students studying in selected nursing schools in Rwanda.

1.4 Research questions

- i. What are the socio demographic characteristics of students studying in some selected schools of nursing in Rwanda?
- ii. What is the stress level among students studying in some selected schools of nursing in Rwanda?
- iii. What are the possible stressors for students studying in some selected schools of nursing in Rwanda?
- iv. What are the coping mechanisms adopted by students studying in some selected schools of nursing in Rwanda?
- v. What students studying in some selected nursing schools in Rwanda know about stress management measures and complications of stress?
- vi. What are the concepts of the stress management model for students studying in

some selected schools of nursing in Rwanda?

1.5 Significance of the study/Rationale/Justification of the study

The results of the stress management model that will be adapted will be sent to the Ministry of Health and will likely to be used in developing policies related to stress management among nursing students in Rwanda. Similarly, the same recommendations will be sent to the Ministry of Education with a request to establish ways of using stress management model in schools.

Nursing schools will likely use the model to prevent and manage stress among nursing students in Rwanda. Nursing students will be aware of causes of stress and through self-initiative and assistance from teachers and significant others in their lives will try to avoid stress. The study results will likely be used by other nurse researchers as a point of reference when involved in research related to stress management.

1.6 Study limitations

As stated by Mugenda and Mugenda (2009) in their work on “Research methods”, a limitation is an aspect of a study that may have negative impact on the results but over which the investigator has no control. According to Mugenda and Mugenda, frequent limitation in human science research is the scope of the study which often may not permit the findings to be generalized. For them, another common limitation is the sample size. The underlined factors which can be controlled by the investigator should not be considered as limitations, unless a good rationale is provided (Mugenda & Mugenda, 2009). This study was focused on the assessment of stress and adaptation of a model of stress management for students studying in selected schools of Nursing in Rwanda; namely, UR, MKUR and RHIH. The researcher was not able to cover a bigger area that includes all schools of nursing in Rwanda and consequently the findings are not generalised to the whole Rwandan population of nursing students. However,

the results will be in eye opener to the stressors experienced by students in the study population and the recommendations may be useful elsewhere.

Also, unavailability of nursing students due to their elevated amount of academic, clinical, and personal requirements have been considered as limitation.

1.7 Scope of the study

The study was based on adaptation of stress management model for students studying in selected schools of nursing in Rwanda. It was conducted from January 2020 to September 2022.



CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter is aimed to present the written theories that are related to stress by including the theories and other generalities about stress specifically among nursing students and model of stress management for students.

2.1 Empirical literature

2.1.1 Stress level, stressors, and coping mechanisms of nursing students.

In 2022, Zheng, et al conducted a study to determine the prevalence of stress among nursing students in their internship. In this meta-analysis, the prevalence of stress among practicing nursing students was estimated to be 61.97% using a random effects model. Thus, the results suggest a high prevalence of psychological stress among practicing nursing students, which is very concerning. The reasons for this may be analysed as follows: first, nursing students enter an unfamiliar clinical environment from the campus, a wide variety of nursing operations, and the gap between the theoretical knowledge learned in school and clinical practice, which can bring some psychological stress to the students. Secondly, nursing students have less social experience and relatively less ability to communicate with people, and poor communication with their supervising teachers, patients, and families as well as complex interpersonal relationships can bring corresponding stress (Zheng, et al. 2022).

Mild stress can stimulate the organism to be in a state of tension and stimulate students to study, while high levels of stress or stress lasting too long can cause an imbalance in the organism and lead to physical and mental illness, affecting nursing students' ability to work in the clinic and even shaking their determination to pursue nursing. If nursing students lack appropriate strategies to cope with stress and the negative effects of their work life, it will not only affect their personal physical and psychological health, but

also affect their clinical professional competence, affect the quality of care, and lead to burnout (Baluwa, M.A., 2022). The results obtained through different studies suggest that attention should be focused on the stress level of intern nursing students and bring it down to an appropriate level. Nursing students face multiple psychological stressors during their internship, and studies shown that among the stressors of internship nursing students, employment stress is the first stressor of nursing students during their internship. It is said that this may be related to the fact that the number of nursing students graduating has been increasing year by year in recent years, while the number of jobs offered by major hospitals is becoming less and less, the employment situation is becoming increasingly severe, and the gap between nursing students' career expectations and employment reality causes them greater stress (Fernanda, M. S., et al., 2020). They reported that internship nursing students' stressors to their knowledge and skills are the main stressors of nursing students' internship. The reason for this is that nursing students end their familiar campus life and step into clinical practice, which brings them different degrees of stress due to the change of identity, learning environment, and employment pressure. Other showed that intern nursing students' professional identity and psychological resilience were influential factors of psychological stress. Stress was negatively correlated with nursing students' professional identity, and the higher the professional identity and the stronger the psychological resilience of intern nursing students, the lower their psychological stress levels (Atlantic University, 2022).

Globally, the immense literature in medical research have documented that the level of stress for students in nursing schools vary depending on different factors. This supports the existing need to implement a wide range of interventions that target to improve the level of stress among these students, for not only their academic performance but also

their well-being and health in general. Similarly, studies have documented the evidence that the stress level may increase as a factor of level of education. As for this, it was observed that from the 6th to the 10th semester, students in nursing schools gradually experience the increasing level of stress compared to other professions, this however, reduces their ability to communicate, and interact with the external environment, or other professionals (Joyce University of Nursing and Health Sciences, 2022).

The above evidence is supported by the fact that, these students face many challenges, that are coupled with both theoretical and practical clinical workload compared with students in other semesters, especially lower semesters. In addition, these works are of paramount importance, since they make students mature in the field of nursing practice, improve their abilities to articulated effective communication with others in the same professions (healthcare providers) (Fernanda, M. S., et al., 2020). Furthermore, different studies have supported the evidence that the stress level faced by students in nursing schools negatively affect the ability and quality of communication these students exhibit ion general. In fact, the younger age has also been identified as an important fact worth of consideration. Students in young age are more prone to higher level of stress during their academic programs, than their counterparts in older ages. Young students face enormous challenges, including the fear of taking decision in clinical setting during their internships than the older ones. Coupled with this, they also face financial constraints, limiting their ability to effectively afford transportation, accommodations, and other basic needs, to advance their academic performance (María, D.O. et al., 2020).

Moreover, students in higher academic levels, may be required to gain more practical experiences that are needed yet to be nurse professionals. These students feel the need to start new responsibilities, but it is obvious to realise that this can generate some level of

stress too. However, this may justify the fact that students in more advanced academic levels may feel more stressed than those in lower levels. Coupled with the above, there is also a need to reflect on multitude of uncertainties and doubts that may arise when students in nursing schools think on labour market in nursing profession. These students undergo a tough process or certification, licensing, and approvals, which may affect or delay the realization of their expectations as prospective health professionals (Reddy, K.J.; Menon, K.R. & Thattil, A., 2018).

The types of courses, and programs may also affect the level of stress among students in nursing schools. However, although practical sessions bring more stress, it was reported that theoretical sections of the course need to be considered when it comes to implementing strategies and interventions that aim to prevent or reduce the burden of stress among these students. Especially students in undergraduate, may feel more stressed and concerned to better assimilate the theoretical contents. In addition, they express the fear of failure when it comes the time for assessment (Baluwa, M.A., 2022). Another study done in 2013 by Leodoro assessed student nurses stress and related stressors. The whole population of the university's nursing students was selected to participate in the study. In that research, the participants were requested to provide information related to their stressful situations experienced during their past clinical attachments and college life. The results revealed that nursing students recalled several stressors including heavy academic workload and among the recommendations formulated by investigators highlight that the stakeholders of nursing education need to be sensitive to students' stressors and find out the ways to improve their coping mechanisms (Leodoro, 2013).

In relation to stress and stressors, Edward did a study in 2015 among nursing students in Tamale, Ghana. The study mainly examined the severity of stress and stressors

which have been reported more. The study findings indicated that 13% of nursing students were affected by severe stress. Personal issues have been reported by 43 % of participants as stressors followed by academic and finally social matters by 27 % and 9 % respectively. In concluding, the investigators recommended that students' orientation program should include sensitive topics like students counselling and measures to deal with stress (Edward, 2015). In the same line, Chris (2013), carried out research about stress and related coping mechanisms adopted by nursing students. In his study, it has been found that clinical placement experience was reported as the main cause of stress among the studied population at 39 %. On the other hand, avoidance (which is the negative coping mechanism) and peer support as stress coping mechanisms were the most measures applied by nursing students. Nurse leaders and educators have been recommended to intervene accordingly for improving the teaching and learning process of nurse students (Chris, 2013).

Another study has been done to compare the levels of stress among the students from different professions. It has been found that nurse students experienced higher levels of stress compared to other students enrolled in medical, social work and pharmacy departments. Besides contesting examinations, high workload and other commitments, nurse students identified hospital attachments as their major stressor. Inadequate profession experience, panic related to possibility of making profession errors, complicated clients, anxiety caused by continuous clinical assessments and presentations have been reported as few of the stressors for the nurse students in clinical areas (Gibbons, 2014; Jimenez, Navia-Osorio & Diaz, 2015). Respectively, in the year of 2014 and 2017, in School of nursing at the University of Louisville, studies have been conducted with the main aim to identify nurse students' stressors more stressful in their educational process than the theoretical component (Sheu, et al.,

2014; Katrina & Valerie, 2017). Either lower or moderate levels of stress are able to influence student behaviour in terms of motivating positively or negatively the students' performance. Contrarily, higher levels of stress are known to negatively impact the student's academic performance, thus leading to depression and despair, and therefore affecting students' health and academic level. Although stress might be inevitable among students in nursing discipline, and sometimes difficult to overcome, it is imperative to have adaptable coping mechanism that may help students to improve both their health and academic performances. Therefore, the recent longitudinal studies have demonstrated that stress level many either increase or decrease during academic programs because of behaviour or coping mechanisms that are successful or not (Baluwa, M.A., 2022).

Different studies recommended the analysis of studies on stress level among nursing students reflecting gender, course, and clinical placement, based on the available literature. Therefore, as different countries have different programs that may also differ by country and programs, these variables must be considered with caution. This is because in come studies, the first year was identified as being the most stressing while for others the third or last year was concluded as the most stressful year due to more clinical practices and placements are to be accomplished. Therefore, as much as reacting to stressors may be different among students, it is the same as when it comes to manage stress. However, problem-solving strategy was identified to be the most important and successful strategy that can be used to deal with stress among students. Besides, emotional based coping approaches also appear to be effective too (Zheng, et al. 2022). Moreover, although this field of stress and coping strategies was largely investigated in different countries, little to none was sufficiently studied on this subject matter in sub-Saharan African countries. Existing evidence is documented on the

available types of stressors among students enrolled in nursing programs, and the types of adaptability, but countries in this regions did not clearly provide levels of stress by country, or by program or by curriculum to inform academic institutions, policy developers, and implementing institutions on the trends of the threat and recommend on remedial strategies, for the best country outcomes (Fernanda, M. S., et al.,2020).

2.1.2 Knowledge of nursing students about stress

Other studies have demonstrated that students in lower academic levels and semesters appear to experience higher levels of stress, that are mostly related to both theoretical and practical parts of the courses, but, also to their insufficient knowledge in matter of stress management measures. This may be explained by the fact that there is a lot of academic works, coupled with that these students are new in the field of nursing, and that are facing new courses in the discipline, and all these may bring more concerns to these students, thus increasing the level of stress. Therefore, researchers have continued to document the need of improved knowledge on coping mechanisms and strategies.

Existing scientific evidence supports the idea that these students use most of the time negative coping mechanisms having in their mind that those mechanisms are the best way to deal with the daily life stressors (Atlantic University, 2022).

As per the findings of Folkman and Lazarus, problem solving was identified to be the most important and effective strategy to cope with higher levels of stress used by students in nursing schools after getting information to differentiate the positive and negative coping mechanisms as stress management measures. Nevertheless, it was demonstrated that problem solving, cognitive reconstruction and social or psychological support may inversely correlate, which indicate that people who suffer less level of stress, will use more often these strategies compared to those who suffer

higher level of stress. In the similar way, positive correlation was documented among those who experience greater level of stress, with traits of anxiety. However, before improving their knowledge about stress management measures, those students used wishful thinking, self-criticism, social withdrawal, and problem avoidance as their best strategies to overcome stress (Zheng, et al., 2022). Another study in Singapore has documented the evidence that students in nursing schools use mostly strategies such as sharing information about stress in different events such as public talks, talking their stressing circumstances with their peers were the best useful opportunities to improve the students' knowledge about stress management and so to prevent or control their level of stress. Conjointly, the relationship of students, educators and other university staff have also been documented, to influence the level of stress students experience during their academic journey. Therefore, educators and mentors are important to be considered when it comes to elaborate strategies and interventions aiming to prevent, reduce or control stress level among students. The researchers added that improving the knowledge of students in matter of stress, its causes, consequences, and adequate preventive measures or positive coping mechanisms must be included in the approaches for the proper implementation of strategies towards better and successful academic life (Tung, Y.J., et al., 2018).

Pawan, et al. (2016) did a study in a College of Medicine located in Gujarat in India, and they realized that there are high levels of stress in newly admitted students, and those students were not able to differentiate between positive and negative coping mechanisms of stress. The senior students attending the same institution who participated in this study confirmed to have experienced different academic stressors specifically caused by the specific nature of their courses, but different occasions like with opportunities to discuss about stress helped them to improve the related knowledge

and thus to reduce the negative coping behaviours and practice the positive ones . Based on those findings, the investigators recommended that the concerned organs should make sure that the programs to help students dealing with stress mainly by improving the students' body of knowledge in matter of stress are available starting at the period of students' admission (Pawan et al., 2016).

The related literature provides that coping mechanisms can be sought as ideas, behaviours and actions undertaken by a person towards adapting his internal and external influences that are believed or perceived as stressful. Studies have demonstrated that these stressful conditions either internal or external affect negatively students' academic performance and their life in general. Fortunately, the same studies found also that, the way the students respond to the stressors are changed and improved over time with the opportunities to be exposed to the discussions, lectures, public talks among others in order to change their mind-sets about dealing with stress. The recommendations from several studies state that educational institutions assess all causes and factors that can bring stressing level on high level, and try to minimize, reduce, or avoid them whereas possible. This can be achieved on one hand by formulating program policies and interventions that aim at supporting students' efforts towards academic performance and improved well-being in general (Baluwa, M.A., 2022).

2.1.3 Need for development of the model of stress management for nursing students

In Uganda, a study was conducted to examine relationship between academic stress and academic performance among 196 undergraduates of Mbarara University. This study has adopted a design of cross-sectional. The results demonstrated that academic matters were reported to be the most stressful, and individual problems were the least stressful, and both types of stressors impact negatively the students' performances. In that study, Nakalema and Ssenyonga concluded by highlighting that there is a strong

need to improve the study habits of students by putting in place a program aimed at reducing academic stressors (Nakalema & Ssenyonga, 2014).

Mohsen, Sara & Saeid (2017) conducted research entitled “The efficacy of a training program designed to manage stress for nursing students in Iran. The study findings revealed the significant difference between the two groups involved in the investigation (anxiety $p = 0.001$; stress $p = 0.011$); and this remained even, after a month. The above mentioned investigators suggested that it would be better to hold the sessions planned to improve students' coping measures against stress (Mohsen, Sara & Saeid, 2017).

Despite working in more challenging settings, students in Malawian nursing school do not experience stress levels more than learners in other countries. This may be due to lack of essential supplies, severe shortage of nurses and negative attitudes among others. Moderate levels of stress can be attributed to the psychological resilience that students develop having been brought up in environments suffused with acute challenges. Resilience is the ability to overcome adversity and it does grow stronger with experience. Additionally, determination could be assisting Malawian students to still learn under difficult conditions and persevere. The study revealed that academic issues were the highest cause of stress than clinical and external factors. This finding contradicts the studies that reported high stress levels from clinical elements in comparison to academic and external. High levels of academic stress observed in this study could have been influenced by activities happening during the research period (Baluwa, M.A., 2022).

Different tips to manage stress for staying stress-free have been listed by different authors. Those tips are consistent physical exercises, spending enough time with loved persons, contribute actively to public activities and other relaxation events. The level of psychological stress varies from one person to another and depends on our temperament

and how we respond to the changing situations. One person may be flexible in letting disturbing situations go away. In other hands, some people are not flexible and always remain attached to disturbing situations which cause to prolonged stress to them (World Health Organization, 2021). There are simple tips to implement for successful stress management and those tips are stated as follows “a 30-minute daily walk can help you feel better and help keep your immune system strong, so you don't get sick. Try relaxing activities: you could look for an app or wellness program that uses breathing, meditation, or muscle relaxation exercises. Get enough sleep every night, avoid too much caffeine, decide what you need to do now and what can wait, and focus on what you got done each day, not on what you weren't able to do. Also, ask your family or friends for support” (Atlantic University, 2022).

2.1.4 Critical review and research gap identification

Many researchers assessed stress level among nursing students and found high and moderate levels. They also assessed the possible causes of stress and related coping measures adopted by learners. In addition, studies demonstrated that nurse students are more prone to stress compared to other students registered in other departments. These students sometimes adopt negative mechanisms unknowingly, and investigators strongly suggested initiation of program that facilitates students coping with stressors using positive coping mechanisms. After critically analysing the literatures, a gap has been found, no research has been done in Rwanda about stress among nursing students and there is no scientifically developed coping mechanisms nor another stress management model for nursing students in Rwanda. Thus, the reason for conducting a study on the adaptation of stress management model for nursing students studying in schools of nursing in Rwanda.

2.2 Theoretical literature

2.2.1 Stress

In history, the word “stress” has Latin background and has been introduced in common language to mean suffering, danger, or problem. Stress is best defined as a state in which demands exceed the resources. According to Counseling and Wellness Centre “stress is a feeling of emotional or physical tension. It can come from any event or thought that makes you feel frustrated, angry, or nervous. Stress is your body's reaction to a challenge or demand. In short bursts, stress can be positive, such as when it helps you avoid danger or meet a deadline. But when stress lasts for a long time, it may harm your health”. There is need to understand, before condemning stress outright, that stress is only dangerous and health threatening, if it is too much (Counseling and Wellness Centre, 2017).

2.2.1.1 Hormones released in our body during psychological stress.

Psychological stress is just how our brain and body react to a problem or request. If someone has stress, his / her body produces substances which are called hormones. Those chemicals make people vigilant and prepare them to react. The produced hormones may lead to high blood pressure, heart increased heart rate, and even high levels of blood sugar. The above-mentioned consequences may occur once or may become chronic according to one's personality and opportunities of stress management measures (World Health Organization, 2021). Epinephrine: This hormone is recognized by most people as "adrenaline" and it stimulates the accelerated pulmonary and cardiac activities. This leads to elevated amount of blood in our brain and thus, we feel aware and more conscious (American Psychological Association, 2016). Cortisol: It gives our body the energetic characteristic as reaction to short time stress. Once it is prolonged, it can modify the metabolism of glucose and the manner the blood

pressure is regulated (American Psychological Association, 2016).

2.2.1.2 Main types of psychological stress

Stress is a normal feeling, and there are two main types of stress:

Acute stress: this is a short-term type of stress that disappears much quicker. One can realize it when fall in conflict or crass or fight with his or her partner. Importantly, it helps the recipient to manage hazardous situations. Nevertheless, it can also happen when someone is doing something new, or exciting in nature. Normally, individuals may experience acute stress at once or many times. Chronic stress. This is a long-lasting type of stress that occurs when someone has either financial constraints, unfortunate marriage, or employment issues. It may span for weeks or months, and one might experience it as chronic unknowingly. Once not sufficiently addressed, it may result into many health concerns. As a chronic or long-lasting medical condition, which may span up to weeks and months, most of the time the body acts as it is threatened by an aggressor (Atlantic University, 2022)

For students, stress can take one of three forms: Acute Stress: this appears to be the most encountered form of stress, that results from daily stressors such as rushing to attend classes, waking up late, having low grades. Most importantly, this type of stress disappears more quickly, and appear to have little mental health effect on the students. Episodic Acute Stress: as referred by its name, this is a type of stress that is episodic and occurs when students face a wide range of stressors for a long time. It is presented mostly tension headaches and migraines. Chronic Stress: Chronic acute stress occurs when an individual is unable to manage longer stressful situations. Evidently, when students are facing struggles in the major courses may feel stressed, and can develop chronic acute stress, which can result into excess weight gain, lack of sleep, and anxiety (Thomas, B., 2022).

Causes of long-term stress include routine stress: this may result from routine needs of daily work, school, family affairs, financial constraints, and other recurrent pressures that come around. Stress from sudden, difficult changes in your life, such as divorce, illness, losing your job, or other unhappy life events that often have a long impact. Traumatic stress, this occurs when someone faces an extreme danger or other serious harm that can lead to death. Among these, include deadly accidents, wars, floods, earthquake, or other frightening events. However, it can cause many problems that may last for so long time, and can be named post-traumatic stress disorder (Counselling and Wellness Centre, 2017).

2.2.2 Stressors

2.2.2.1 Sources of stress in university students

The sources of stress may vary widely. These include the environment source such as sound, fumes, traffic, weather, and overcrowding. It can consist also of physiological source such as disease, injury, change of body hormones, and change in sleep or nutrition pattern. In addition, thoughts which are the ways of thinking that influence the response of a person to negative self-discussion, thus may lead to elevated levels of stress. Furthermore, social stressors may include but not limited to economic issues, workplace associated needs, societal duties, and the loss of a loved one (Counselling and Wellness Centre, 2017). Although university students may respond differently to a wide range of stressors, some events are almost similar and stressful at the same rhythm. Amongst, here are some of the stressors faced by university students: Finances: to afford all needs such as tuition and housing related costs, a lot of students work while in school. Despite, part-time jobs aren't typically available, and may pay less of just minimum wage once available. New levels of independence: apart from attending classes, or setting for exams, and interacting with different people of their networks, many students are also concerned with growing up in usual live. Some of

them are not familiar living outside their family homes, which may easily complicate their life once they are away from their homes (Reddy, K.J.; Menon, K.R. & Thattil, A., 2018).

Living among strangers: University students frequently experience a sense of isolation on new campuses, particularly if they're in a strange city or state. Some students struggle to establish friends in a new situation because they are painfully shy by nature.

Cohabiting with roommates: Many university students are not familiar sharing living rooms with others and may feel discomfort when obliged to live with someone else they hardly know in the same room. This can bring many stressful feelings and may take some time for a student to get familiar with this condition.

Coursework and Exams: Students often feel overwhelmed by the increased workload associated with class coursework. In the vast majority, exams and other assessments left students stressed, as a result of hard studying other than usual. This can enormously contribute to stress and anxiety levels that are coupled with other school pressures.

Social obligations: Universities add a lot of social demands, such as the expectation that one must have a large social network and participate in weekend activities, on top of academic pressures. Stress can be made worse by cultural pressures and peer pressures, particularly for first-year students.

Romantic relationships: Once a student is in a romantic relationship with another student and both face stressful lives at the university, the extent of pressure and stress can be greater than it should be if there was no relationship. Furthermore, many students may feel worried or not yet discovered their sexuality orientations or gender identity, which can impact daily life (Thomas, B., 2022).

On the above-mentioned causes of stress among university students, Atlantic University added the following: relationships or lack of friends: socializing with others at the university was observed to be one of the main challenges for many university students. However, this is exacerbated when they are obliged to go into part-time jobs for them to afford university and personal needs. A student's mental health suffers when they don't spend enough time with their friends or do not have any sort of social life at all because

they have so little time to "recharge". Homesickness: normally the young university students are usually familiar with home life, where they eat home-cooked meals every day and enjoy social life with their family members at home. However, it is stressful for them to find themselves in a situation where they are treated as legally adults, moving thousands of miles away for studies, feeding themselves and taking care for themselves in everything. This sudden transition usually comes as a stressor with negative effects in the first times of studies of young students. Ending the Stigma: Ending stigma for university student is the first and paramount approach. This can be done by spreading awareness of the effects of academic stress on students' mental, physical, and emotional health. Only by continually and persistently addressing this issue and educating each other can overcome academic stress (Atlantic University, 2022).

According to scientific data, there are more stresses among health professionals than in other professions, and these stresses result in more negative health effects that go untreated. This is thought to be a psychological component that has an adverse effect not just on their academic achievement but also on their general well-being. Main Causes: Nursing students have been seen to experience stress during their theoretical or clinical hours for a variety of reasons that also affect their performance. Fear of failing schoolwork and tests, a lack of future planning, a lack of confidence, ongoing negative issues, anxiety, sadness, and some type of depression or irritability are among the most significant factors that have been identified. It can also be due to poor sleeping behaviours or poor satisfaction towards performance or work or discomfort, nervousness or tiredness or decreased financial constraints (Reddy, Menon & Thattil, 2018).

As a result, several research on the incidence of stress among nursing students have

shown that different academic programs are offered all over the world, and different scales are used for measuring various factors. Additionally, varied perspectives on stress between cultures and among individuals may have an impact on stress levels. Stress was defined by Lazarus and Folkman as “a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being”. Additionally, the changes anticipated on both an intellectual and personal level necessitate taking into account how the environment specifically, the various clinical settings nursing students visited throughout their training affects their levels of stress or anxiety. The other study suggested that concerning other specialized services such as intensive care or emergency care units, the students had higher levels of nervousness and stress during these clinical field placements (Maria, et al. 2020).

The recent findings revealed that students less experienced demonstrated advanced levels of nervousness, while the most experienced students showed lower levels of stress and anxiety. This may be due to the fact that once experienced, educators and other nurses may expect more from them, because they are skilful. On the other hand, those who are less experienced may feel less confident and embarrassed to achieve desired level of performance, thus, leading to excessive stress. For instance, advanced clinical practices in clinical placements are done in advanced academic years, while in first year trainings conducted on general services on uncomplicated cases that require basic competencies and responsibilities. Therefore, students who are extensively trained required higher level of competences and skills during patient care, thus yielding in higher level of stress (Atlantic University, 2022).

2.2.2.2 Symptoms of stress

Stress symptoms come out in different ways and vary from individual to another.

Physical and physiological indicators of stress includes: muscular tension: Our muscles activate when our sympathetic nervous system triggers stress hormones. This may cause muscle ache or pain if stress is not well managed. High blood pressure and increased heart rate: due to the production of epinephrine and cortisol. Indigestion and gastric pain: those health problems are caused by muscle tension, nutritional and hormonal changes during stress and they may lead to gastric discomfort, ulcers and sleeping difficulties. Other indicators under this section may include, but not limited to fatigue and headaches (Counselling and Wellness Centre, 2017). Emotional symptoms hostility: once the fight-or-flight instincts are triggered by a stressor, some persons get frustrated or irritated to defend themselves. Sadness: If someone is experiencing stress on an ongoing basis, he or she is at risk to fall in a pessimistic perspective. Social isolation: Isolation and stress, with one feeding the other, can become a vicious cycle. Other symptoms under this section include but not limited to hopelessness, irritability, anxiety, and feeling upset (Counselling and Wellness Centre, 2017).

Cognitive symptoms: loss of concentration and memory: short term stress can assist to be focus and clearly keep in mind events and details. But prolonged stress has consequences on ability to pay attention and retain information, and this is bad news for students. Behavioural symptoms: This occurs when there is a disruption of hormone production, thus affecting eating habits temporarily. To better cope with this chronic stress, students may use alcohol or drugs. Decreased sex activities can also be seen, as caused by libido deterioration. Moreover, sleep disturbances are often common and are characterized by insomnia (Harvard University, 2015). Excessive stress level: stress can be presented by both physical and emotions symptoms. Most of the times, these symptoms are not apparent to be the results of stress. Therefore, as a results of

excessive level of stress, the affected persons may experience diarrhoea or constipation, forgetting behaviour, recurrent aches and pains, headaches, lack of energy and focus, and sexual disturbances. In addition, stiff jaw or neck, tiredness, sleeping troubles, upset stomach, drug and alcohol abuse, and weight imbalances may be among the prominent signs of higher level of stress (Araas, 2016).

Specifically for university students, behavioural, emotional, and cognitive reactions were identified to be experienced by people who are exposed to a stimulus that provoke a certain level of stress. This occurs similarly to students enrolled in universities globally. Among these students, stress may manifest in various ways that include physical symptoms such as sweating, increased heart rate or blood pressure, vertigo, shortness of breath, fatigue and stomach pain. It may also be presented by emotion symptoms such as hostility, irritability, and other mood disturbances, increased worries, feelings of helplessness and loneliness. In addition, it can be manifested by behavioural symptoms such as reduced eating appetite, drug and alcohol abuse, decreased sexual activity and erratic sleeping imbalances. Furthermore, cognitive symptoms may also occur such as memory loss, negative outlook, loss of concentration, and disconnection from thoughts and personal identity (Thomas, B., 2022).

2.2.2.3 Complications of stress

Depression is mostly characterised by disturbances due to the extremely extended stress, and healthcare professionals encourage people to always seek for medical advice to better improve their lives and cope with stressors. It is a severe and serious medical condition other than just feeling sad for few days. The WHO reports that 19 million people including young and adult people suffer this medical condition (WHO, 2021). However, depression persists and affects daily life of affected person. Among its symptoms, include the feeling of sadness, or “empty”, loss of interest for the important

activities, excess eating behaviour, or simply unwilling to eat at all, sleeping disruption, tiredness, feeling loss of hope, irritation, anxiety, feeling guilty, aches and headaches, cramps, digestive issues, thoughts and attempt of suicide. Moreover, it can be caused by variety of factors, including biological, genetic, environmental, and psychological factors amongst others. It can occur at any age of life, but most importantly starts in early ages of life among young adolescent and adult people. Women are the most affected populations worldwide, mostly due to their parental duties such as during postpartum period. However, it can also be seasonal, such as during winter in some countries. According to the National Institute of mental health (2022), the effective treatment for depression consists of talk therapy, and administration of antidepressants, or both (National Institute of mental health, 2022).

Anxiety disorders: this condition is mostly characterized by shaking and tension of the muscles.

Anxiety may be expressed by fear, dread and restlessness of the affected people. Likewise, it is presented by sweating, restless feeling, and rapid heartbeat rate. Sometimes, it can be seen as a normal body reaction. Evidently, one might feel anxious once experiencing excessive workload or other work difficulties, before setting for job exams, or before making an important decision. Nevertheless, it can also be beneficial in terms of boosting energy or helping to keep the focus for affected people. Despite, those affected by anxiety demonstrates constant fear for long time, which can be overwhelming. In some cases, anxiety can persist and become worse, while on another hand it can last shorter than weeks. It therefore affects one's daily activities, performance at work, schoolwork, and individual or personal relationship (APA, 2016).

Causes and risk factors: the main causes of anxiety disorders are not well known.

Associated factors may include genetic factors, brain, biology and biomedical related

factors and environmental factors have a key influence. Gender such as being women have been observed to be among the risk factors, but social anxiety may affect sex equally. General factors may include certain personality traits, such as being shy or withdrawn when someone is in a new situation or meeting new people, traumatic conditions in childhood, or adulthood. In addition, family history and other mental health issues, and physical conditions may also lead to anxiety (APA, 2016). Symptoms: different symptoms may differ as different types of anxiety disorders are present. All the symptoms interfere with daily life conditions, and are hard to control, leading to affected persons feeling restless. These symptoms may last for so long time, such pounding or rapid heartbeat, unexplained aches and pains, dizziness, and shortness of breath, changes in behaviours, leading to disruption in daily activities. Substances such as caffeine and other medications was observed to worsen the symptoms (Smitha, 2022).

Treatment: the most important treatment option of anxiety include psychotherapy, or medication or both combined. Cognitive behavioural therapy: this is the most common psychotherapy option used to treat anxiety disorders. It encompasses teaching variety of ways of thinking and behaviour changes. It also aims to influence the ways people react to different situations that causes fear. It improves the comfort and reduces fear for individuals to focus on their daily and routine activities that were avoided normally.

Medications: Antidepressants are the most common options to treat anxiety disorders globally. In addition, medications may offer better specific medical outcomes that others. Healthcare providers provide a wide and appropriate range of treatment options, suitable to each patient needs. In addition, combination of different options was also proved to provide more results (NIMH, 2022).

Heart diseases: usually, heart disease is referred to cardiovascular disease, which

include heart and blood vessels disease. These diseases may be prevented and managed by both improving behaviours and medical remedies. As there exists many types of heart disease, some may be hereditary, or congenital and other may develop later in lifetime. Among heart diseases, coronary artery disease is the most common type. It appears slowly, due to a sticky substance known as plaque, that forms in the arteries vessels and hinder the normal flow of blood by narrowing the vessel walls, thus leading to excessive and hard blood flow. Therefore, it may result into a condition known as angina, which is a chest pain that results from lack of blood flow, heart attack, and affecting the heart to do not adequately supply the blood as per needs of the body (Mayo clinic, 2014).

Other causes: the causes of heart diseases depend on a type of a disease, and some stressors may influence the likelihood of their occurrence. In addition, lifestyle, genetic predispositions, medications, and other diseases was observed to cause heart diseases.

Risk factors: heart diseases may result from a wide range of factors, some of which may be changed by public health interventions, lifestyle and behaviour changes. Advanced age, sex may influence the likelihood of heart disease in both men and women. Family history and genetics factors such as family history raises the risk of heart disease. The scientific evidence has proven that some genes are strongly linked to increased risk of heart diseases. Lifestyle was also recognized to be amongst the strong risk factor, such as eating a highly saturated fats food, refined carbohydrates, salts, lack of physical activity, excessive alcohol drinking, and tobacco smoking. Medical conditions such as high blood pressure, high cholesterol levels, diabetes, obesity, autoimmune and inflammatory diseases, chronic kidney disease, and metabolic syndrome have been proved to be the risk factors of heart diseases (WHO, 2021).

Symptoms: symptoms of heart diseases may sometimes not appear at early stages of the

disease, until complications such as heart attack may present. However, later, symptoms occur and are different depending on the form of the disease. Treatment: treating heart disease differ according to the form or type of disease has been diagnosed, and the symptoms a patient is presenting with. However, there is a variety of treatment options that include heart-healthy lifestyle changes, medications, procedures, or surgeries and cardiac rehabilitation (Harvard University, 2015). High blood pressure (BP): This is the driving ability of the blood flow against the walls of vessels commonly known as arteries. In cardiology discipline, systolic pressure is said when this force of blood is higher to push blood from heart towards different parts of the body. On the other hand, it is said diastolic pressure when the heart is seemingly at rest. This calls the need to use 2 different numbers when it comes to read the blood flow rate, one referring to systolic and the other on diastolic . Diagnosis of high BP: since it usually has no apparent symptoms, health care providers use to regularly make checks with the use of stethoscope or other electronic sensors. For establishing an accurate diagnosis, two readings of blood pressure are taken in 2 separate sessions, normally days, on both arms (Atlantic university, 2022).

Globally, primary and secondary BP, are the 2 main types of high BP, with primary being the most common encountered, and mostly develops over time as long as one gets older. The secondary one that is normally caused by some stressing factors and may need medications to alleviate its effects, or simply by removing or stopping the stressors. Complications of high BP: High BP is a serious health condition which may lead to fatal outcomes once not well managed or controlled. When it spans for an extended time, it may become hard for the heart to complete its function of pumping blood, thus leading to heart attack, stroke, and heart failure and renal or kidney failure, and death later. Treating higher BP consists of both changing lifestyle, and medications,

depending on the severity or degree of the condition. Among healthy lifestyle changes include but not limited to eating heart-healthy foods, doing physical exercise, and quitting form tobacco smoking. On the other hand, the lifestyle alone will not revert the patterns of high BP, thus, the need of medications. Despite, some medications were proven to raise the blood pressure, and if this is the case, stopping or changing the concerned molecule will be the best option (Counselling and Wellness centre, 2017).

Diabetes: this medical condition refers to the availability of higher or increased levels of sugar in blood stream, compared to the acceptable levels. The glucose coming from the food people eats, is normally regulated by hormonal function, including insulin among other. Therefore, Type 1 diabetes refers to the inability of the body to effectively produce insulin, while the body fails to use available or produced insulin in the type 2 diabetes. Moreover, the inability of the body to either produce or use of insulin results into higher concentrations of glucose into blood streams, thus leading to the condition namely diabetes (Mayo Clinic, 2014). Consequently, the highest levels of glucose in the blood stream for a prolonged time can lead to poor health outcomes on body systems and organs, such as the damage of eyes, kidneys, and nerves among others. However, though diabetes can cause other serious health threats such as heart disease, stroke or amputation of some body parts, it can be controlled through adapting meal plans, making physical exercise a daily routine, controlling weight or adopting medications once the trends are far to revert back to normal. In addition, diabetes can affect all age groups, in both sexes, including pregnant women (WHO, 2021).

Chronic sleep disorders: most commonly, sleeping problems and anxiety are observed to be twinned. One may lead to other and vice versa. Sleep disturbances most commonly encountered is referred to as insomnia, that reflect to the inability of a person to fall asleep when it is necessary, or stays asleep for a long time whereas not necessary, but

both situations may also coincide. In this case, one may experience little to no sleep, thus feeling not well refreshed when wake up. Studies have demonstrated that 2 types of insomnia are dominant than others: the short-term or acute insomnia which lasts for days or weeks is the most common that is characterized by excessive stress at work, family compressions, or traumatizing events. Additionally, the condition can last for longer periods that can spans for months, and in this case, it is categorized as chronic insomnia. It is noted that some substances such as those containing caffeine, tobacco, and alcohol are known to insomnia. However, insomnia can be controlled in this case, by medical remedies such as medications to alleviate the effects and consequences on overall health and well-being (NIMH, 2022).

Insomnia has been widely encountered in all group of people, including both women and men, and affects all age categories. Therefore, the predominant known risk factors include excessive stress, the feeling of depression or emotional disturbances (such as separating with the partner or spouse or death), financial constraints such as lower income, work related stressors such as night work or recurrent night shifts, long travel distances and unhealthy lifestyle. Clinical signs of insomnia: individuals suffering from insomnia may take a long time lying awake before falling asleep in the middle night, and only sleep for short periods once they get asleep, which lead to the feeling that they did not sleep once they wake up, and most of the time they wake up very early in the morning.

Other effects of insomnia: lack of concentration and energy at work, and daytime sleepiness are the most encountered effects of insomnia. However, affected persons may also feel anxious, depressed, and irritated, lack of focus and attention on assigned tasks, failure to learn new things, and remembering what was normally known by affected people. Once not well addressed, it can lead to serious problems such as

drowsy while driving a vehicle or manipulating a machinery, which can result into fatal accidents (Counselling and Wellness centre, 2017).

Diagnosis: as a medical condition, insomnia is diagnosed by healthcare professionals, through sleeping history taking of affected person. However, details in terms of sleeping habits, identification of stressors in daily life are among others to be screened. In addition, there is no laboratory or biomedical test adapted to measure the existence or extent of insomnia. Treating insomnia consist of a wide range of remedies, both lifestyle changes, counselling, and medications to advanced stages. Therefore, if well adopted, healthier lifestyle changes are suitable to improve sleeping behaviours, and are known to relieve the acute insomnia in a short period. In addition, professional counselling commonly known as CBT, has been demonstrated to be successfully to manage insomnia globally. Thus, in advanced stages of insomnia, medications are the best options to quickly alleviate and curb the anticipated effects on health. Nevertheless, it was observed that some people preferred to use drugs to alleviate the symptoms of insomnia, but this may cause addiction to these drugs, which may result into other health problems later on. However, people are advised to always seek medical advises on qualified health care professional, such as medical doctors, psychiatrists, and counsellors before taking any kind of medications (American Heart Association, 2016).

Chronic muscle pain: Affected individuals may experience chronic neck pain, lumbago or back pain, abdomen pain or headaches which are not results of bodily injuries. The mental health specialists suggest physical exercises and meditation as lessening measures. Headache is the most prominent pain that most people experience in their life and can cause negative impact of both health and productivity of affected persons, such as increasing work absenteeism, and missing classes for students. Tension headache as the commonly encountered type is characterized by tightness of the shoulders, neck

and scalp and jaw muscles of the affected individuals. Therefore, this type of headaches is most importantly acquired by people who work harder, those who fail to sleep enough time, those who use to miss their meals, and those who excessively abuse alcohol among others. As a result, affected people feel stressed by this condition, leading to depression, and nervousness. In addition, migraines, cluster headaches and sinus headaches may also be encountered as other types of headaches. Although headache is a medical condition, that require medical attention, it does not always need medication. The affected people may choose to remove or stop its cause, by changing the lifestyle, adapting new ways of learning and relaxation, and sometimes it is necessary to take some pain relivers in severe headaches. In addition, it is always recommended to seek for medical advice when experiencing persistent headaches because it may be due to causes other than anticipated mainly once is coupled with stiff neck, fever, confusion, consciousness, and eye pain, thus, it can manifest as a sign of other diseases (NIMH, 2022).

Another complication of stress can be the stomach problems or trouble digesting food: stomach problems vary depending on individual and causes, and almost everyone has experience one of a kind of indigestion, or feeling discomfort or burning feeling in upper abdomen, or heartburn, or even feel distended or nauseated. These are believed to be the most prominent simple stomach problems. These may result from eating too much once stressed, smoking, or drinking too much alcohol containing beverages, taking some medications, or simply because one is tired or having some stresses that cause the digestion going wrong. This could help to avoid foods and situations that seem to contribute to it. Consult a medical professional if your indigestion persists for more than two days, you have extreme discomfort, or you experience additional symptoms because it may be an indication of a more serious issue. To identify the cause, your doctor may

use an upper endoscopy, lab testing, and x-rays. To address the symptoms, you might need medication (Mayo Clinic, 2014).

The following consequences of stress have been found to be more and more frequent among students:

Physical effects: although stress is linked to mind most of the times, it has been observed that it can result from different stressing events. Similarly, higher levels were observed to be strongly linked to physical manifestation of academic stress, and physical presentations of stress are most prevalent among others and may differ from person to person. Headache and muscle pain: for so long time, headache and muscle pain was considered to be the result of lacking enough water at cell level, or excessive physical activities that required enough energy spending. Despite, headache, and muscle pain was also observed in many instances as the way of clinical presentation of scholarly stress. However, this is because when someone is stressed, muscles are extended, dilated, and when this happens for a long time, it results into aches and pain that are felt in different parts of the body, including muscles and head.

Nausea and stomach pain: this can manifest mostly by aches in the stomach vessel and may results into diarrhoea and constipation. Though it can be due to different illnesses, academic stress was also identified to be among the important cause among students (Atlantic university, 2022).

Psychological effects of stress: among university students, the stress may result from the feel to improve academic performance most of the time. This is in terms of expressing fear of failure in academic majors, which increase stress level, thus affect students' psychology and the overall outcomes. Depression and anxiety: as presented in the survey by the Anxiety and depression association of America (ADAA), it is not something new to hear that academic stress can worsen the situation for those who were

basically depressed or had other mental health problems. The survey demonstrated that 30% of students enrolled in university programs have had negative effects for their performance because of academic stress that persists (Atlantic University, 2022).

Sleep disorders: Studies have demonstrated that there is a correlation between sleeping disorders and academic performance globally. However, as much as people or student fails to sleep as normal, cortisol as hormone is released in the blood stream, thus, negatively affect not only the memory, but also metabolic rate, and blood glucose concentration.

Obesity: obesity is referred to as a condition where a person acquired excessive weight compared to its height. It incurs serious and chronic health conditions that may include cardiovascular diseases, cancers, metabolic disorders, and impairments of some body systems. **Causes of obesity:** Taking in more calories than your body uses can lead to obesity. This is because the body stores unused calories as fat. Therefore, it is shown that obesity is mostly due to eating behaviours where individual tend to eat more fatty foods, drink excessive sugar, and use too much alcohol, while they have not met the required daily physical activities. As majority of people with obesity will not exhibit enough willpower to lose weight consistently, this is why the lost weight are always gained back in the future. Many people regain more weight than they lost. Today, we know that biology is a big reason why some people cannot keep the weight off. In addition, living in the same place and condition may influence the likelihood of developing obesity among people, while this is not the case for others (WHO, 2021).

The biology configuration of human body has its own way of regulating different nutrient inputs. Thus, this ability is sometimes impaired in some people, as much as the eating behaviour and habits may vary since one is a child to the older age. These behaviours and habits govern the way we eat, the types of food we eat, how and when to eat a certain food in one's life. Again, cultural influences, the diversity in available

foods and affordability may all influence the way and what people will adopt to include in the menu. The term eating disorder refers to a group of diseases that place an unhealthy attention on eating, dieting, losing or gaining weight, and body image. Obesity, an unhealthy diet, and an eating disorder can all coexist in the same person. Weight gain can occasionally be caused by or worsened by medical issues or treatments, including prescription drugs like birth control, antidepressants, and antipsychotics. Leaving smoking is another factor that might result in weight gain; many smokers see a 2- to 5-kg rise in the first 6 months after giving up. Stress, anxiety, sadness, or poor sleep quality can all contribute to weight gain. Menopause: women may gain between 5.5 to 7 kg during menopause. During pregnancy, some women may not lose the weight and they gained their body weight instead (Academy of Nutrition and Dietetics, 2016).

2.2.2.4 Stress in women

Globally, the health consequences of stress are equally distributed among women and men. Despite, some particularities may exist, as a matter of gender. Therefore, women will be more prone to the consequences than men, because women are believed to experience more stress than men, and all have different way of coping on stress. For instance, headaches and migraines are more common among women than men because women muscles tend to tense up more quickly among women than men, thus leading to tension type headaches. Depression and anxiety: the recent evidence proved that women are as twice as more likely as men to experience the effects of depression globally. The existing research suggests that women are more prone to have anxiety disorders including PTSD, panic, obsessive compulsive disorders, and are more likely to acquire and demonstrate the signs of stress than their counterparts, men which can increase the risk of depression and anxiety in general. Heart problems: it has been

observed that high level of stress that persist over time contribute enormously to the likelihood of higher blood pressure, and in turn may translate into serious health conditions such as stroke and heart attacks. Similarly, women who are young, and who have experienced the history of heart problems may suffer increased negative effects of stress on heart health. Stomach upset: As documented widely, long or short- term stress level can negatively affect the function of the stomach, thus yielding in diarrhea, vomiting and constipation. However, longer stressing level may be more serious and lead to irritable bowel syndrome (IBS), a condition more pronounced in men than women, and characterized by gas and bloating worse (Harvard University, 2015).

Obesity: The World Health Organization has established that the link between stress and increased weight is strongly pronounced among women that it is among men. This is mainly due to hormonal factor, cortisol present in high level among women, and influence the overeating habit, thus causing the body of women to store more fat than men do. Problems of getting pregnant: women who are under greater stress than those who are under less stress are more likely to experience difficulties getting pregnant. Stress might also result from not being able to conceive when you want to. Menstrual cycle problems: women who experience chronic or long-term stress may have more severe premenstrual syndrome (PMS) symptoms or irregular periods. Some studies link past abuse or trauma to more severe PMS. Decreased sex drive: women with long-term stress may take longer to get aroused and may have less sex drive than women with lower levels of stress. While not surprising, at least one study found that women with higher stress levels were more distracted during sex than other women (WHO, 2021).

2.2.2.5 Stress among nursing students

Nursing is a practical profession that requires both practical and theoretical proficiencies in clinical settings. The practice has been proven to advance knowledge and skills among students who study nursing profession, by supporting their ability and efforts to translate theoretical knowledge into practices that aim to improve patient outcomes. There is scientific evidence that supports that to acquire required skills in this profession, problem solving, a sense of professionalism and critical thinking and decision making are required among others (Fernanda, et al, 2020). Nevertheless, negative experiences in this profession can lead to lack of self-esteem and confidence, poor satisfaction and performance. To build much the practical part, clinical and practical placements are arranged for these students in different clinical settings, including hospitals, clinics, and health centres. Therefore, these students undergone a huge stress in these placements, and may feel more stressed to cope effectively especially on environmental factors, workmate relationships, and work overload. These situations seem to be challenging to these students, and sometimes their capacity or ability to cope are exhausted, leading to chronic stress. However, chronic stress may affect undoubtedly their physical, psychological, emotional, and behavioural life, thus compromising their general wellbeing. This is also considered to be a major risk factor of stress among students studying nursing professions (Baluwa, M.A., 2022).

The current studies have identified higher level of stress among students and the biggest contributor to their well-being and health, but also impair their academic performance and ability to deliver much in their nursing profession. However, in the viewpoints of individual perception, stress may vary depending on individual perception on how to cope and manage stressful situations and events. Therefore, in nursing profession, it is of paramount importance to consider the academic context in which these students are,

for better addressing their needs. Eventually, students undertaking nursing profession are exposed to a wide range of stressors compared to other students in different disciplines. Coupled with academic stressors, these students face additional stressors such as extreme workload in their training, responsibilities in clinical settings during their placements, and field attachments, tough evaluation combined with accumulation of academic duties among others (Chaabane, S. et al. 2021).

In addition, stressing environment may be coupled with the content of the semester in which the student is enrolled. However, the stressing outcome differ to student by student, and may be lesser or higher depending on student cognitive and emotional abilities to manage stress. Different assessments or studies are conducted by depending on the year and the semester in which the students are enrolled. Others may orient their efforts on the program level such as undergraduate or graduate studies in clinical practice. Therefore, the studies have clearly demonstrated that there is a huge difference in terms of stress acquired depending on the above factors. However, this calls a need to continuously advance further researches in terms of what drives these differences (Fernanda, M. S., et al., 2020).

Furthermore, the studies in Brazil have demonstrated that there are other factors that were not considered but proved to influence the likelihood of stress. These include marital status, working activity, age of the students, gender, and other socio- demographic factors. However, this study concluded by suggesting further studies on association between socio-demographic factors and stress level, because their results were inconsistent with other international study results. It is apparent that national surveys on stress level among students in nursing profession are more concentrated in Southern regions of Brazil than other parts of the country. And those focused mainly on factors other than socio-cultural and academic contexts, which highlight the need and

importance of extending researches on other fields such as sociodemographic and academic characteristics globally, and in different institutions including where placements are conducted (María, D.O. et al., 2020).

The recent study showcased that psychological and physical stimulus that are involved in disrupting homeostasis originates from a stress factor, thus the name of stressor. This stimulus either physical or psychological may initiate changes that are denoted as stress response. However, the stressor response starts by preparing the body to respond to the internal or external challenges, thus presentation of physiological responses. Sometimes, if the exposure lasts too long, or is persistent or recurrent, the response may adapt otherwise, with many negative effects such as depression, anxiety, cognitive impairment, and cardiovascular diseases (Atlantic University, 2022).

The recent studies have shown that professionals in medical fields experience increased levels of stress compared with other professions. In addition, students in nursing and medical practices face higher levels of stress, compared to other disciplines. This is coupled that students in these fields of study face extreme consequences of stress other than groups. Therefore, it is of paramount importance to start assessing stress level beginning the time when a student starts its internship, to promote his or her physical, mental and emotional health, but also improving his/ her academic performance, and also the quality of its profession in general after graduation and joining clinical practices in clinical settings (María, D.O. et al., 2020).

The subject matter of stress was given consideration overtime in scientific literature and other medical profession documentation as it is nowadays. Most importantly the practical section of the training is believed to bring more stress than others. In this section, lack of practical skills or lower adaptability to skilfully master the technical practices are all perceived as the key stressors in nursing field of education. Other

stressors include but not limited to making mistakes in clinical placements, handling emergency cases in emergent situations, and lack of adaptability in specialized clinical units (Fernanda, M. S., et al., 2020). In addition, given that nurse students are normally not considered as same as the registered nurses, may bring some frustrations and stress, thus exposing them to some feeling of lack of confidence, and expose them to some tasks that are not usually done by nurses. Coupled with this, students delay making adaptation specially to build strong work relationships with other health professionals, the rankings observed in hospitals, situations and cultural behavioural of different patients and families (caregivers), complexity of some treatment options may all add up to the existing stressors, thus building more negative effects. Additionally, nursing students cohabit with other stressors of the kind that are expected given their status as students, such as those connected to their academic program and their status as nursing students. This is because, in contrast to students in other degree programs, nursing students are in touch with the job market, which necessitates a certain level of responsibility in the wellbeing of their patients, distancing them, at times, from campus life and particularly from the typical social activities that their peers take part in (Tung, Y.J., et al., 2018).

Either lower or moderate levels of stress are able to influence student behaviour in terms of motivating positively or negatively the students' performance. Contrarily, higher levels of stress are known to negatively impact the student's academic performance, thus leading to depression and despair, and therefore affecting students' health and academic level. Although stress might be inevitable among students in nursing discipline, and sometimes difficult to overcome, it is imperative to have adaptable coping mechanism that may help students to improve both their health and academic performances. Therefore, the recent longitudinal studies have demonstrated

that stress level may either increase or decrease during academic programs because of behaviour or coping mechanisms that are successful or not (Baluwa, M.A., 2022).

As the recommendations in different studies, the analysis of studies on stress level among nursing student may reflect gender, course, and clinical placement, based on the available literature. Therefore, as different countries have different programs that may also differ by country and programs, these variables must be considered with caution. This is because in some studies, the first year was identified as being the most stressing while for others the third or last year was concluded as the most stressful year due to more clinical practices and placements are to be accomplished. Therefore, as much as reacting to stressors may be different among students, it is the same as when it comes to manage stress. However, problem-solving strategy was identified to be the most important and successful strategy that can be used to deal with stress among students. Besides, emotional based coping approaches also appear to be effective too (Zheng, et al. 2022).

The existing literature provides that coping mechanisms can be sought as ideas, behaviours and actions undertaken by a person towards adapting his internal and external influences that are believed or perceived as stressful. Studies have demonstrated that these stressful conditions either internal or external affect negatively students' academic performance and their life in general. It is recommended that educational institutions assess all causes and factors that can bring stressing level on high level, and try to minimize, reduce, or avoid them where as possible. This can be achieved on one hand by formulating program policies and interventions that aim at supporting students' efforts towards academic performance and improved well-being in general (Baluwa, M.A., 2022).

Moreover, although this field of stress and coping strategies was largely investigated in

different countries, little to none was sufficiently studied on this subject matter in sub-Saharan African countries. Existing evidence is documented on the available types of stressors among students enrolled in nursing programs, and the types of adaptability, but countries in this regions did not clearly provide levels of stress by country, or by program or by curriculum to inform academic institutions, policy developers, and implementing institutions on the trends of the threat and recommend on remedial strategies, for the best country outcomes (Fernanda, M. S., et al.,2020).

Coupled with the known stressors, clinical practices intensify the stress level among students in nursing programs. One can understand a student who use to sit in the class for theoretical sessions, how he or she can feel dealing with patients extremely suffering to die, managing extreme emergences, and wounded patients. Together with inadequate skills and knowledge, poor relationships with other clinicians and unfamiliarity with the clinical setting environment may all exaggerate the stress level of these students. Therefore, initial period of clinical placement is observed to be the most stressing period in nursing placements, although students have reported similar patterns in advanced years (Tung, Y.J., et al. 2018).

Yet, students feel more stressed with external factors such as accommodation, financial constraints, as well as classmates' relationships and peer pressures. However, this calls the need to have in place adaptive and coping mechanisms that motivate students to keep being optimistic towards their academic goals and orientations. These strategies are meant to support students alleviate the effects that these stressors may have on their academic performance, but also their well-being in general. Though some studies may have been done in African countries such as the one conducted in Malawi, that identified numerous factors that may lead to stress among students in nursing programs, the aspects of stress, and its level was not fully subjected to investigation. Therefore, there

is a strong need to design academic programs that fully support to address students' needs in terms of preventing, controlling and alleviating stressors that students in nursing programs may encounter (Reddy, K.J.; Menon, K.R. & Thattil, A.,2018).

Though some factors such as financial issues and level of study are known to influence stress, there is a need to adequately provide the extent to which these factors contribute to the stress levels among students in nursing programs. Therefore, it is worth to note that knowledge and skills of students with regards to stress management is important in terms of preventing students to face stress by managing stressors adequately. Compared with other countries especially globally, African countries report a considerable number of students who experience elevated levels of stress. This may be dictated by different contextual factors that are solely encountered in Africa, such as poverty. As for instance, 50% of African countries are categorized below poverty line, and 25% live in extreme poverty, and these situations alone may increase the level of stresses African population including students.

Similarly, this pattern is coupled with the insufficient resources in many educational institutions and clinical settings in Africa (Baluwa, M.A., 2022). Again, studies have reported insufficient number of human resources, and inadequate knowledge among available staff, to effectively support students in their clinical practice engagements. This implies higher burden of fear to these students, of acquiring or contracting some of hospital acquired infections such as HIV, tuberculosis, and others (Fernanda, M.S., et al., 2020).

Effects of stress in nursing students: taking academic program in nursing field can be believed to be with not effects, most importantly negative ones. Students in nursing may feel anxious, stressed, and depressed throughout their academic program in comparison with their counterparts in other education programs. Nursing program embodies

enormous challenges and stress, that will negatively impact students' creativity and their ability to improve learning performance, thus causing them mental fatigue, stress, and depression among others. However, the complex curriculum of nursing program coupled with other stressors encountered in daily life may exacerbate the impact of stress on students in nursing programs. Therefore, early identification of sources of stress, can meaningfully bring more impactful change toward overall performance, thus motivating them to acquired required skills needed in the nursing profession (Atlantic University, 2022).

2.2.2.6 Coping strategies

Physical exercises have more healthy impact, including but not limited to fitness, reduced risk of many chronic diseases, social relationship, and overall well-being. Yet, there are several types of exercises and can be adapted to each one, all ages, and all categories of population. However, there are also perceive humour: Positive reframing is recognised in assisting people to deal with little problems. Seeking support: Requesting assistance from a confident person has showed effectiveness to calm stressful situation. Problem-solving: It is a process aimed at locating the problem source and identifying solutions. In work situation, this coping mechanism is often helpful. Relaxation and physical recreation: These calming methods have been found to improve stress coping mechanisms. In addition, having physical exercise on regular basis was identified as one of the best approaches to d benefits to combine many forms of them for more effective health benefits. Endurance, or aerobic: these are types of physical activities that aim at increasing the breath and heartbeat rate in general. By this, they improve majority of parts of the body, including heart itself and cardiovascular system in general, lungs and body muscles to keep their fitness and healthy functioning. Some of among them may be illustrated as walking, jogging, swimming, and biking

(Minichiello, V.J., 2022).

Resistance training: these types of physical exercises aim at strengthening the muscles in general. They may include lifting weights, and use of resistance bands. Balance: Balances are exercises that aim to improve someone's ability to walk and prevent falls. Most of the time, taichi is preferred by a lot of people who choose to do balancing exercise. Flexibility: Flexibility exercises aims at stretching people's muscle and help to stay limber. Practicing yoga can be one exercise in this kind. However, it is of paramount importance to include sports or physical activity in regular daily schedule, though may seem difficult at the starting, but as long as you practice, the beneficial impacts will motivate the rest. Therefore, to meet the daily efforts, the world health organization suggests 150 minutes for moderate intensity exercise and 175 for vigorous intensity exercises (WHO, 2021).

Avoid too much caffeine: naturally caffeine is a chemical substance that can be found in more than 60 plants globally. Among these plants, include coffee beans, tea leaves, kola nuts used to flavour most soft drinks, and in cacao pods used to make chocolates. However, it can also be synthesized industrially to be included in different medicines, foods, and drinks. So do energy drinks and "energy-boosting" gums and snacks. Effects caffeine on human body: it has been demonstrated that caffeine is able to stimulate nervous system in human being, which can be seen as beneficial for the fact that it helps to awake and energize human body. In addition, it is characterized by its diuretic properties that helps human body to get rid of excess of water, through urine. It helps also to improve digestion by stimulating the release of acids in stomach during digestion, though this can sometimes lead to stomach aches or heartburn. Furthermore, it was observed to have some interferences with the absorption of calcium in the human body, thus increasing the flow of blood. Caffeine can reach the maximum pick only in

the first hour following its consumption, and its effects can still be felt up to six hours later (ACCA, 2012).

The side effects from too much caffeine: although caffeine has beneficial effects on human body, it has also some drawbacks once consumed in excessive quantities. Therefore, for an adult people, it is recommended to take no more than 400mg daily. Once limits are overtaken, some people may experience restlessness and shakiness, insomnia, headaches, dizziness, fast heartbeat rate, dehydration, anxiety, and most importantly dependency. In addition, it has been noted that some people exhibit sensitivity traits to caffeine, compared to others (WHO, 2021). Energetic drinks: Caffeine can also be added in energetic beverages, in a varied amount depending on the manufacturer or consumer desire. Most of the times, it is recommended to indicate on the label that the drinks contain a given amount of caffeine to improve physical and mental health of consumers. Some other energetic drinks may contain some added sugars, vitamins, mineral salts, and other supplements. Nevertheless, there is no grounded evidence to support the fact that these types of drinks containing caffeine increase power, and strength to consumers, rather, negative impacts can be realized due to the large amount of caffeine that may be included. In addition, different types of industrial sugars, additives and supplements may result into negative impacts to consumers, such as triggering different types of cancers, diabetes, and weight gain. Consequences may worsen if these types of beverages are mixed with alcohol, a behaviour commonly realized among your adolescent people. This can result in different body malfunction due to heavy drinking, thus make ones lose his ability to make informed and consent decisions (Counselling and Wellness Centre, 2017).

Remedies to limit the amount of daily consumed caffeine are most important. Therefore, one may opt to check with healthcare provider to have beneficial counselling

and remedies. In addition, caffeine can cross the placenta, thus reaching the foetus. Therefore, pregnant women are advised to limit or avoid the consumption of caffeine during pregnancy and breastfeeding period because it has ability to pass in the breast milk thus causing sleeping disorders, migraines, chronic headaches, anxiety, ulcers and arrhythmia. Caffeine withdrawal: caffeine withdrawal syndrome can be observed to people who have use to consume caffeine for a long period, but suddenly decide to stop it. This effect can cause several health issues, including increased headaches, drowsiness, irritability, nausea, and concentration troubles (Counseling and Wellness Centre, 2017).

Avoid smoking: A long-term stress reducer is not smoking. You could do something more productive and healthier, like go for a quick walk or do a relaxation exercise, in the time it takes to smoke a cigarette. Smoking doesn't make the issue go away that's stressing you out. Stress will reappear. Addiction to nicotine results in tension. Because removal symptoms start to manifest in your body, nicotine cravings can be distressing. Some smokers who use cigarettes as a stress reliever find it difficult to quit. Finding appropriate coping mechanisms for stress and self-care without smoking is crucial. There are numerous alternatives to smoking for reducing stress (American Psychological Association, 2016).

Other coping strategies: Adjusting expectations: It can help people to be prepared by anticipating different social scenarios outcomes. Denial or venting: It is completely avoiding the issue. Self-blame: The culpability leads to low-self-esteem and if the cause is not effectively managed, the affected person is at high risk of developing depression. Maintain a daily routine: People are advised to learn how to become resilient, by making daily routine. In addition, making adaptation such as lifestyle change, may reduce the fear to contracting diseases, and feel more confident to master the situations that are faced. Nevertheless, this can be difficult to afford especially for

people with mental health impairments (Murdock, Naber, & Perlow, 2014). Sleep Adequately: Recommendations of the minimum required time of sleeping among age groups have remained controversial subjects in research. Yet, the recent recommendations from the world health organization states that an adult people must sleep at least 8 hours a night, which brings more beneficial impacts to the body and mind. During the sleep, the body gets enough time to repair, relaxes and rejuvenate or reverse the negative effects of stress. However, sleeping can be observed as hygienic act that helps the body to reconcile and return to normal function. In addition, it is strongly advised to ensure that the sleeping room is enough quiet, and comfortable to guarantee enough and healthier sleep. This include ensuring acceptable temperatures are in the room, avoiding on or around the bed the electronic devices such as TVs, computers, and smart phones. Similarly, it is recommended to avoid heavy foods, and drinks, such as alcohol and caffeine containing drinks (Counseling and Wellness Centre, 2017).

Sleeping is a complex biological process that helps body to process new information, stay healthy, rest, and relax from the daily activities. During the sleep, the brain keeps functioning, making the people to be conscious. During this time, the brain goes through 5 consecutive and gradual stages and rapid eye movement sleep. A series of events are expected to be experienced during sleep, but all keeping the breath, and normal body temperatures, though it can be slowed. Sleeping relax the entire body, boosts muscle mass, repair damaged tissues, improve hormone production, and function which contribute to fertility and growth especially in at younger ages. In addition, it has been reported that the sleep helps to improve immune system, thus contributing to quick recovery for sick people (WHO, 2021). The amount of sleep: the amount of sleep one can have is strongly dependent on different factors, including but not limited to age, lifestyle, health condition, and ordinal sleeping habits. However, it is recommended that

the new-borns sleep at least 16 to 18 hours a day, 11 to 12 for pre-school children, 10 hours for school aged children, and 9 to 10 hours for teens, and 7 to 8 hours for adult peoples. Consequently, later in puberty, teens tend to change their usual sleeping time, thus delay to sleep. This has impact in their sleeping outcomes, and awaking time, because they feel sleepier in the morning and wish to keep sleeping in the morning while others are awake (WHO, 2021).

As much as some people may think that older or adult people need to sleep more, there is no evidence to support this conception. As people age, however, they tend to get less sleep, or they tend to spend less time in the deep sleep, restful stage of sleep. Most importantly, older people are easy to be awakened than younger people. However, this does not merely depend on the number of hours one has slept, but the quality of the sleep one has got. Therefore, for instance people who use to interrupt their sleep have poor quality sleep and may get upset or stress due to poor quality sleeping (National Institute of Mental Health, 2022). The side effects of not getting enough sleep: overall, sleeping have demonstrated health benefits to human. However, one may lack to get asleep, usually know as sleep deprivation, but can make one feel not only tired or anxious, but it can lead to affect overall individual performance, including the ability to adequately think, taking decision, and bringing up memories as needed. People who miss to sleep are more likely to experience vehicle accidents and have impaired ability to take quick decision. It can also impair the mood, thus leading to irritability, problems with relationships, especially for children and teenagers, depression and anxiety may also prevail. Sleep deprivation was also recognised to affect physical health of affected people. Existing studies have shown that not having or having poor quality sleep may increase the risk of high BP, cardiovascular disease including stroke, renal failure, obesity, and type 2 diabetes mellitus (American College Counselling Association,

2012).

Lack of sleep may be the result of hormonal insufficiency especially growth hormones. It can also show that the immune system of affected people is weak to respond to immune response of the body, to fight infectious agents, and repairing damaged cells. In addition, sleep deprivation exacerbates the consequences of alcohol abuse. The following are the tips for better sleep: to improve better sleep, one may decide to recognise the conditions through which he or she is going through and identify what is missing to have good quality sleep. Therefore, allocating enough time to sleep, especially during night, may increase one's feeling of happiness, and enjoy life, and be productive during daytime. In addition, it is advised to take a regular time to sleep, and the same time to wake up, to maintain sleeping habits. In addition, it is better to avoid caffeine and alcohol containing drinks before going to sleep, or in the afternoon and evening. Nicotine is a bad enemy to the sleep, and should be discouraged to smoke tobacco in the evening hours or before going to sleep. Heavy meals later in the night are discouraged because they give much workload to the stomach, thus limit the ability of a people to have quality sleep (WHO, 2021).

However, other remedies include having some relaxing activities before going to bed such as taking bath, reading books, listening to soft music, get rid of distractions such as excessive noises, bright lights of a TV, computer screens and smartphones. Do not spend too much time in the bed awake, for more than 20 minutes. If this happens, one is recommended to wake up and find some relaxing activities as those mentioned above. If someone experienced sleep disorders, such as insomnia for a while, consulting a medical doctor is the best option. In this case, the doctor will assess associated factors and try to provide remedies whereas necessary, or medication in case when this is needed (Counseling and Wellness Centre, 2017). Connect with others has been found to

be effective also: the disturbances imposed by COVID 19 pandemic, in terms of the ways people use to do their jobs, disruption of social life and interactions, and disruption both education and in education are globally widespread. Therefore, the way people respond to these hardships are also different, and the impacts are unanimous. Consequently, these have caused enormous level of stress, and despair among all population categories, both men and women, young and adults. Yet, they may have been exacerbated among people who have been suffering other mental health issues, such as depression, and other psychological disorders. However, the need for medical attention is of paramount importance to alleviate the symptoms imposed by these conditions (American Psychological Association, 2016).

Since some of the symptoms may be quite similar to those of stress, some are more persistent and can have more negative impacts on daily life of affected people, such as poor education outcomes for students, and lack of productivity for workers. The restrictions imposed by COVID 19 pandemic have left people feeling embarrassed, due to the restrictions of movements, social interactions between people which is essential to maintain good mental health (Counseling and Wellness Centre, 2017). Healthy eating: eating habits are known to play important parts in human health. Therefore, healthy eating can improve health outcomes for sick people, and can contribute significantly to quicker recovery from a disease. Yet, many people lack the adequate knowledge on balanced diet. Thus, this leads to unhealthy eating behaviours which may worsen the situations, especially for people who were suffering disease comorbidities. However, healthy eating encompasses eating balanced diet, at regular intervals, and the balanced diet must include lots of fresh fruits and vegetables. Regular physical exercise: People was accustomed to do physical exercise, but since the period of COVID 19, people was restricted to freely do some routine that was used to be done. However, there is a wide

range of physical activities one can choose to do even at home, including climbing stairs, push up, treadmills, planks, etc. (Harvard University, 2015).

Literatures have also found ways to overcome stress at university. Some students feel embarrassed or stress at the university during their academic programs, and delay to recognize the threat and take delayed actions. But understanding the burden so quickly and take appropriate action towards improvement is always key for success, for both in academic performance, but also in normal live (well-being). Therefore, there are some important remedies students are advised to follow: adopt and maintain healthy diet: a healthy diet is always recognized as a diet comprising at least vitamins, minerals, antioxidants found in fruits most of the time, carbohydrates, and good fats. For avoiding stress or alleviating some of its symptoms, people are advised to always ensure they maintain a healthy diet. Importantly, it can help to regulate both blood glucose and blood pressure which are subjected to fluctuate because of stressful situation. In addition, students are recommended to avoid taking caffeine containing drinks, in afternoon hours, rather, take water or milk instead, because the caffeine itself may accentuate the lower level of stress one may have from other sources (Academy of Nutrition and Dietetics, 2016).

Physical activity: physical activity does not merely be explained by doing some sport every day. Rather, taking part into physical activity refers to having any activity that can increase the flow of the blood, breathing and heartbeat rate. It helps the body to release some hormones that are beneficial for the body to carry its vital functions, including reducing or preventing stress effects. Relaxation techniques: chronic stress is always as bad to human body. If it lasts weeks to months, it can incur enormous health risks such as increased blood pressure, stomach pains, headaches, anxiety, and even depression. Therefore, there are a lot of relation techniques to lessen the burden of chronic stress on

students (Minichiello, V.J., 2022). Deep breathing: this is the simplest way of relaxation that does not require lots of physical energy, and can be done elsewhere, standing, or laying down. It is practiced by putting one hand to the stomach, and the other on the heart, then slowly, breathe to inhale air until the stomach is full enough. Then, the breath is kept for a while before exhaling all inhaled air. Meditation: this type of exercises consists of devoting all attention to your mind, to feel better relaxed. Meditation is important in the way of helping people recognizing their inner strengths, aligning their thoughts, controlling their emotions, all which help to control stress level that one may be experiencing. The exercise lasts for years, and has been practiced in different ways, including focused attention. This is a type of meditation where the people focus on one object for a while, while a quiet meditation is always done in a quiet place free from distractions. In the body position meditation type, is done by lying down, walking or standing, though many people have think for so long time that meditation is done while sitting only (Spiritual Research Foundation, 2017).

An open attitude: this means that you stay open to thoughts that come into your mind during meditation. Instead of judging these thoughts, you let them go by bringing your attention back to your focus. Relaxed breathing: You take deep, quiet breaths while meditating. This also promotes relaxation. You can learn to control certain of your body's processes through biofeedback, including your heart rate and some muscles. A biofeedback therapist would typically place sensors on various parts of your body during a session. Your skin temperature, brain waves, breathing, and muscle activity are all measured by these sensors. These readings are displayed on a monitor. You next work on altering your feelings, behaviours, or beliefs to assist manage how your body reacts. Individual can eventually become used to changing them without using the monitor. Another simple way that you may use practically anywhere is progressive

relaxing. Concentrate on tensing and then relaxing your muscles, starting with your toes and feet. Continue doing this while concentrating on one group of muscles at a time as you work your way up your body (Counselling and Wellness Centre, 2017).

Yoga: this is the old practice that originated in Indian philosophy, which combines both postures and some types of meditation together. The positions help to increase breathing rate and flexibility while standing, and may range from lying on the floor, to complex positions, that require much energy and physical fitness. Therefore, there are lots of types of how yoga is practiced, ranging from slow intensity to vigorous ones. Individuals who want to start practicing yoga may choose to look for a teacher, who can safely and confidently support on their effort, to have adequate results. In addition, it is important to inform the coach all health problems one may have undergone, to help the coach to find the outmost appropriate techniques, and postures (Spiritual Research Foundation, 2017).

Spend more time outdoors: being in enclosed, less ventilated place may bring some sorts of discomfort, or stress, and anxiety. However, students are always recommended to spend more time outdoors while doing their academic activities such as assignment, self-learning, reading books from library and when having interactive discussions with other classmates. Moreover, spending some happy hours in an outdoor, and green environment significant curb the release of cortisol levels, that are believed to stimulate the stress.

Time management: most of the times, university students feel more stress when it comes to change the workload, from lesser to extensive ones. This requires them to adapt their timing and schedules most of the time, which brings some level of stress higher. Therefore, it is more important for these students to learn new ways of how to adequately manage their time, to have all assigned activities done in the appropriate time, thus respecting all deadlines (Counseling and Wellness Centre, 2017).

Seeking Medical Support: Many people are knowledgeable that academic stress can have detrimental health effects on human body, and this is worse for students who want both academic performance and well-being in general. Therefore, it is important to consider that some of these effects are too difficult to deal with alone, that is why many people are advised to seek for medical support once are facing higher levels of stress. Balancing academic and social life: managing time at the university is the most challenging thing to be successful on. Managing time, and have proper planning, can be more beneficial in terms of improving both academic merits, but also keeping the best relationship with others. Plan: one of the most important this to start with is to scan the scheduled activities of the day. This is done by identifying all activities to be accomplished each day in a week, and write some notes, in the calendar, making each activity a priority for its time. Therefore, students must be optimistic and oriented on spending the right time for each activity of the day. For example, a student may feel like he won't be able to revise all assignments as scheduled, but he/ or she must find a way to fit in as a part of his or her duty. Again, the week may seem too busier for many other important activities. In this case, it is worth to identify what is to be done before other, to maximize the time, and have all important activities done at the end of the day (Minichiello, V.J., 2022).

Respect the schedule: the schedule can be interchangeable to better identify what can be done better. Sometimes, it will be important to have some activities done separately from others, such as schoolwork and family or social affairs, or simply having some activities done in one place and others in the other place. At the end of the day, the goal of the day, which is to have all activities done, will be realized. Consequently, some people may forget some activities. In these cases, they are advised to write down these activities, and keep them all around of them. In addition, they are advised to take as habit of having all assigned activities done in the right way, and in the right time (Tung,

Y.J., et al. 2018). Building a supporting team: combining full-time work and schoolwork is always challenging, but if there is a supporting system, the weight can be lifted away to one shoulder. Therefore, by building a supporting team, it is also important to let everyone the team to know each activity and its sensitivity and priority it requires. Usually, support from people in your life will enable you to accomplish your objectives. You must also contribute to relationships, though. In these situations, compromise and communication are crucial. Negotiate your schedule for home responsibilities, spare time during the week so you can spend it with your family or friends (Counseling and Wellness Centre, 2017).

Focus on targets: sometimes, students may feel embarrassed, and regret why have chosen both work and school simultaneously. Therefore, it is more important to always be reminded the goals of each of the choices. If the reason is to balance student debt or because student is supporting his or her family while also getting a degree, it is important to remember that these sacrifices will pay off later in life. Therefore, remembering that achieving more in life requires to be optimistic, and recognized that we can achieve though none may not be perfect enough in everything (Tung, Y.J., et al., 2018).

Multitask: having ability to do many things at the same time can be more beneficial. Consequently, combining both school and family or social activities aren't always the best option for success. Despite, it is important to learn new ways of achieving great results by having all duties done. One of the best ways is to maximize your time when there is a chance to do different tasks at once. As for instance, you can exercise or go grocery shopping with your significant other or child to catch up and spend time together. It is also advised that when on the ride to work or school, listening to music or audio lectures can be beneficial too (WHO, 2021). Get limits for school and social life:

it has been demonstrated that it is helpful to separate social, and family life from personal life especially if you're working from home can help you achieve the best results. However, this does not mean that studying when you should be working, or let work interfere with quality family time. Setting limits can be beneficial for each activity to be done in its right time.

Request support if needed: one for the most challenging when combining school and work is to make a balance in between. But the most important, is to keep a straight communication with classmates and co-workers, managers, and even coaches. However, additional support may be solicited from all of them needs arise. In addition, discussing the work or study schedule with either family members is among the best options in case there are many obligations. Therefore, keeping a good and effective communication, with family members and school mates and request support as need arises is the best goal to aim when combining schools and work activities (Harvard University, 2015).

Understanding the connection between eating and exercise: health eating and practicing physical activities are beneficial and can go parallel. Whether exercising for fun or preparing for a competition, the diet chosen has a much greater impact on how someone may feel. Keep in mind these dietary and exercise suggestions. But if you want to work out in the morning, rise and shine so you have time to finish breakfast at least one hour before your workout. Be well-fuelled before an exercise (Mayo Clinic, 2021).

Existing research findings demonstrated that eating carbohydrates before exercise can improve workout performance and may allow you to work out for a longer time or at a higher intensity. Nevertheless, having physical exercise with depleted energy levels may bring someone feel sluggish or lightheaded when. In addition, it is important to note that it is recommended to eat a light breakfast or drink something such as a sports drink if

exercises are to be done in one hour following the breakfast. Good breakfast options include whole-grain cereals or bread, low-fat milk, juice, a banana, yogurt (Academy of Nutrition and Dietetics, 2016). It was noted that, one may experience stomach upset after having a drink or a food for the first time in his or her life. Therefore, it is worsened especially when these foods or drinks are taken before having physical exercise that is why it is recommended not to take such foods or beverage. In addition, it is not recommended to take larger meals before 3 to 4 hours before you take exercise, and small meals may be taken not before 1 to 3 hours. It is however, advised to take neither smaller nor heavy foods, because too little might not procure enough energy, while too heavy will also make a person not fit to exercise (Harvard University, 2015). For better performance, it can also be recommended to add some carbohydrate rich foods or sugary beverage on the menu, and best options must take into consideration fruits such as banana, apple and other fresh fruits, fruit smoothie and diluted juice. In addition, snacks such as energy bar, whole grain bagel, crackers and peanut sandwiches, may be important, because they are able to procure the required energy (Mayo Clinic, 2022). Some of the above foods may also be the best options for post workout, such as fruit, peanut butter sandwich, low-fat chocolate milk and pretzels, post-workout recovery smoothie, turkey on whole-grain bread with vegetables. Most importantly fruits are beneficial and should be taken before and after each exercise. Fresh fruits are known to prevent dehydration, by procuring enough water to the body, and can contain anti-oxidants substances necessary to revert the exposure to different types of cancers. Different studies have documented the minimum water quantities required to be health when doing exercise. In line with this, the American College of Sports Medicine suggests that 2 to 3 cups of safe drinking water may be necessary to be taken during workout that do not exceed 3 hours, while a half to 1 cup is taken if the exercise do not

go beyond 20 minutes. In addition, it is recommended also to adjust water intake by kilogram of weight. However, 2 cups may be required for every pound of weight lost, to compensate the lost fluids during exercises (Academy of Nutrition and Dietetics, 2016). In addition to the above, maintaining carbohydrate balance will remain a key, in all sports or workout activities. In line with this, some sport drinks are known to maintain required amount of electrolyte, which gives more energy during exercise. It is however important to recognized that, the amount of energy taken is a dependent factor to the intensity of exercise. For instance, those who practice marathon will require much energy than those who do jogging or who simply walk some miles.

Biologically, all people are different, and when it comes to sport, these differences are also subject matters. Therefore, it is noteworthy to consider that people will feel differently or react differently after workouts, of either low intensity or vigorous physical activity. Because all this may affect the performance, it is advised that each person knows his experience, in terms of pre and post exercise (Harvard University, 2015).

Here are some special tips for stress management among nursing students: the existing research in medical research demonstrated that, nursing programs are the most stressful in many academic programs. This was also reiterated in psychological studies. This is because nurses are required to go through a wide range of courses, thus bringing a great burden of many information that are to be quickly memorized by these students, in addition to other responsibilities. Coupled with the above, homework and other technical practices are also required to improve their clinical experiences and adaptability. Therefore, it is important to consider all kind of stressors before joining nursing programs and have in mind that some of them cannot be avoided completely, rather, manageable (Joyce University of Nursing and Health Sciences, 2022).

Self-care practice: taking care of oneself does not merely mean having a bed rest, or other kinds of distractions. Though they can help to alleviate the hardships of stressful situations such as course evaluations, exams, and assignments, it is important to consider taking care of both physical, emotional, and spiritual life too. Despite, this is most of the time forgotten especially when someone is immersed in different school activities that are coupled with other individuals' tasks, such as caring to the family, and work-related duties. Nevertheless, students in nursing programs are advised to take care of themselves as a priority, to better demonstrate higher academic performance. In addition, self-care efforts have demonstrated healthy benefits, in terms of controlling the levels of stress that can exacerbate if not well controlled or managed effectively (Thomas, B. 2022). Sleeping plans: although many people may adopt different ways of organizing their lives, in terms of taking care of themselves, there is no common ways of doing so; what is important it that everyone recognise as essential as possible that self-care is beneficial. For students in nursing schools, it is most important to recognise the considerable amount of efforts required for them to succeed adequately. Therefore, sleeping enough time is also an important parameter, to advance their academic performance, but also improving their well-being in general. But due to heavy and busier schedules, students in nursing schools are advised to use different tips such as stick notes or any other kind of reminders, for them to do not miss any of required activities such as exams or assignments, while sleeping (National Institute of Mental Health, 2022)..

Clinical practices: clinical practices tend to be among the most stressing activities in nursing programs. This is imposed by the fear of making mistakes, and taking decisions that can impact a human life, and the feel of responsibility and accountability students realises when they start being engaged in clinical activities. This is coupled with the

different needs of patients, and working environment diversity, including working with multicultural staff. As much as nursing profession requires enough knowledge and skills in clinical settings, student in nursing schools also face some discouraging words from their senior workmates during clinical placements. Therefore, this recall a need for them to be equipped with adequate knowledge, skills, techniques, and tactics to better deal with all these stressing conditions (Joyce University of Nursing and Health Sciences, 2022). Keep the targets: students in nursing schools may feel embarrassed and exhausted and may enquire on the choice where it was the right one and informed. This kind of embarrassment are seemingly natural but can worsen the stressful conditions that the doing better. Therefore, it is important to still focused on the main goal and avoid all kind of demotivating ideas and thoughts that may only increase the actual stress, thus leading to poor performance in course assessments (Thomas, B. 2022).

Improved communication: it has can be obvious for anyone who feels stressed to know what the best is to do. This is more exacerbated when it comes for students, especially those in nursing schools. For these students, the apparent stress is most of the time coupled with the school related stress, working stress, among others, and may affect they normal ability to effectively communicate with their peers and other members of the family. Therefore, it is of much interest to understand the burden these students undergone during their academic journey. However, they need more psychological support, accompany and motivation to support them into their efforts (Atlantic University, 2022).

2.3 Theoretical framework

2.3.1 The Transactional Model

Lazarus and Folkman in their work on Stress, Appraisal, and Coping theory, done in 1984, developed the Transactional Model. According to them, stress does not result

directly from the source of stress; it is really due to the inability of the affected people to meet demands. Therefore, for the above-mentioned theorists, stress management is related to a person's ability to use his/her resources to deal positively with stress. Three major concepts are stress, appraisal, and coping. According to Lazarus and Folkman, psychological stress is a special relation between the person and his / her environment that is assessed as exceeding his or her resources and putting his or her well-being at risk" (Academia, 2016).

Cognitive appraisal: at this level, two main factors are taken into consideration: the aggressive trend of individual stress and the evaluation of the possessions required to decrease or eliminate the stressor. Commonly, cognitive appraisal is in two phases as follows: primary Appraisal: here, the affected person try to understand the situation considered as harm. The secondary Appraisal: The concerned person compares situational demand and the available resources. Coping: it is the process of matching the demand and available resources. Two forms are in place: problem-focused coping: it is applied, once, one is confident to control the origin of the problem, and emotion focused coping: it is applied, once, one is not confident to control the origin of the problem, and he / she adopt negative strategies like avoiding, turning to alcohol, etc. (Sarah, 2012).

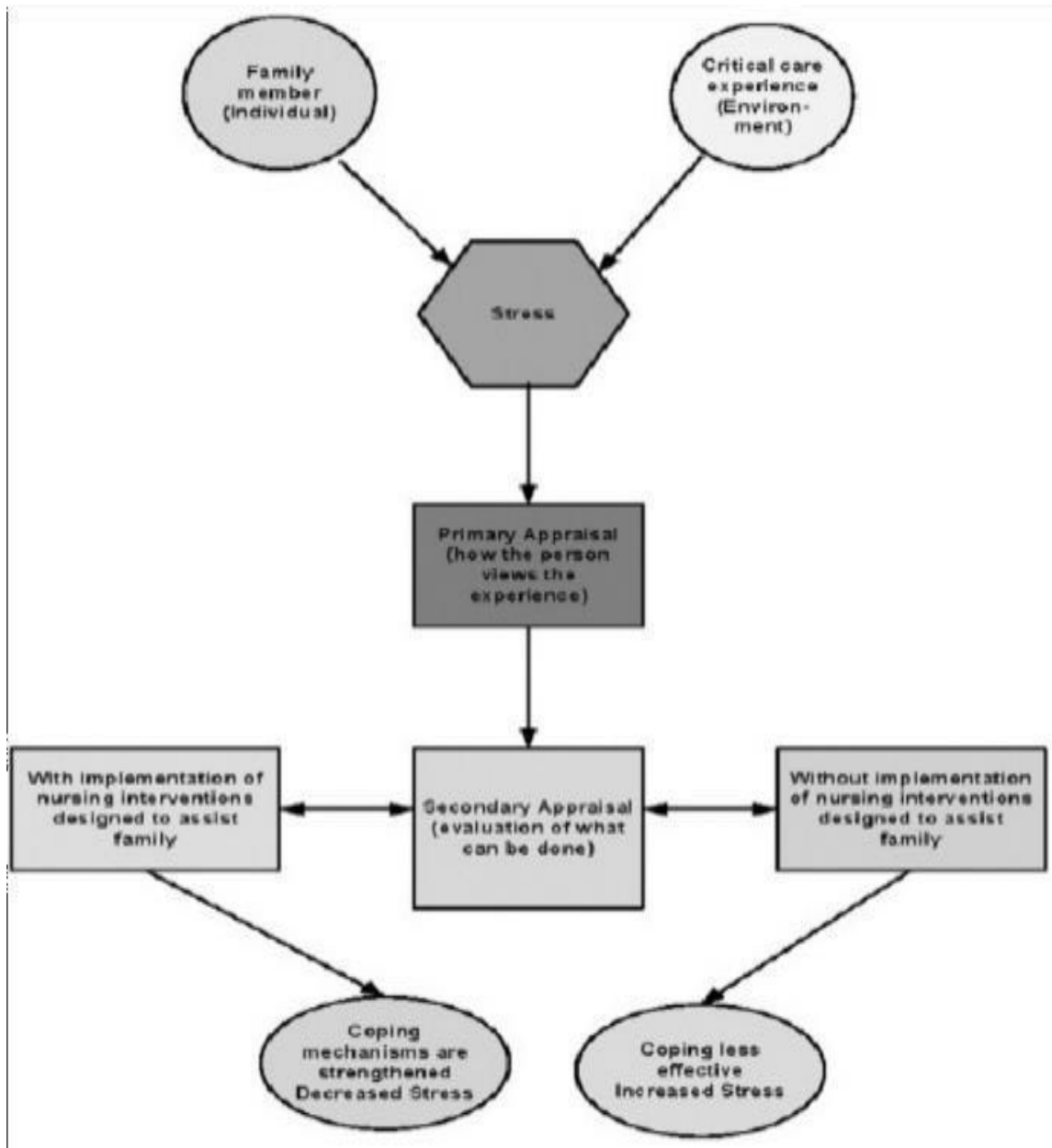


Figure 1: Summary of Lazarus and Folkman Theory Source: (Academia, 2016).

This study was based on Lazarus and Folkman's Stress, Appraisal, and Coping theory.

This theory is appropriate in adaptation of the model of stress management for students studying in selected schools of Nursing in Rwanda, as it describes the features of effective stress management program. It clearly states that, a stress management program could only be considered as efficient, once person's skill to lessen stressor is well evaluated, the related factors considered. Thus, during structuring and contextualizing the stress management model for students studying in selected schools

of Nursing in Rwanda, all the features predetermined in the Lazarus and Folkman's theory were taken into consideration.

2.3.2 Cox's Theory of Stress

In his theory, Cox states that a person is considered to be stressed if she or he is in a situation of imbalance between the perceived source of stress or environmental demands and his or her capability to get the appropriate response to that request. The above mentioned author continues explaining that the classic stressful situation is called so when the available resources of the concerned persons do not match with the level of his or her actual inquiries and that situation usually leads to coping problems. According to Cox, the ability of a stressed person to deal with the stressful moments should be taken into consideration as this plays the vital role in the process of stress management. His suggestion is that if a person can recognize a type of environmental request, then she or he can be assisted to put into practice the best interventions for better responding to the demands of daily life. For successful stress management process, two main factors should be considered that are the personal internal capabilities and external factors such as social support.

2.4 Conceptual framework

The following figure presents the conceptual framework where there are three variables as follows.

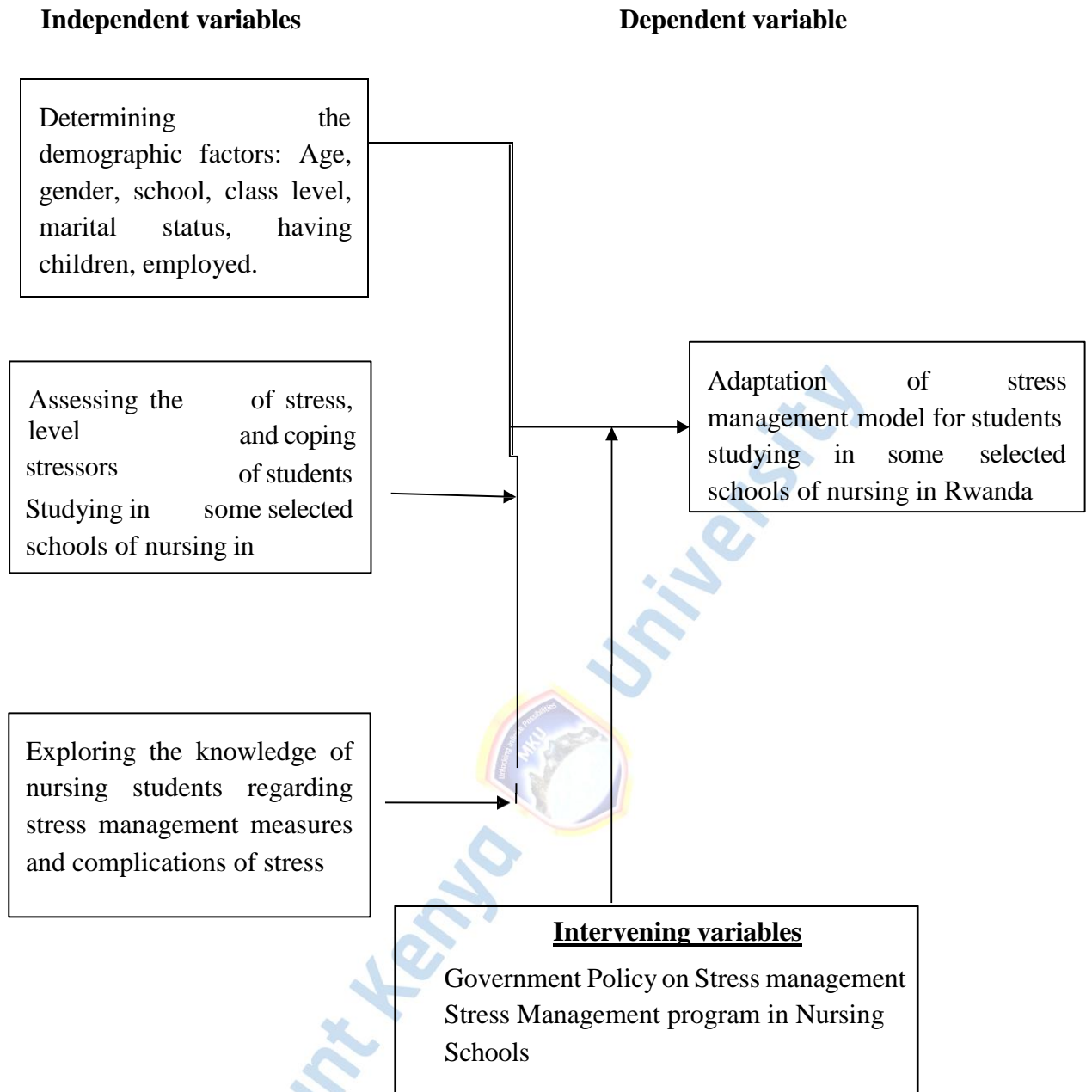


Figure 1: Conceptual Framework Author: Researcher.

This research has three variables: independent, dependent, and intervening variables. Independent variables are socio-demographic factors: age, gender, school, class level, marital status, having children; the level of stress, stressors and coping mechanisms of students studying in some selected schools of nursing in Rwanda; the knowledge of nursing students regarding stress management measures, and knowledge of nursing students regarding complications of stress. The dependent variable of this study is

adaptation of stress management model for students studying in some selected schools of nursing in Rwanda. These independent variables help the dependent variable to be attained. During this research, the intervening variables are the factors which are not the part of the study, but which may affect the study variables. The intervening variable in this research are government policies on stress management and stress management program in schools of nursing in Rwanda. As above mentioned, the independent variables that is: socio-demographic factors, the level of stress, stressors, coping mechanisms and the knowledge of nursing students studying in some selected schools of nursing in Rwanda, help the dependent variable to be attained that is adaptation of Stress Management Model for Nursing Students in Rwanda. The stress management model for nursing students in Rwanda was adapted by means of several sources, like study results and other relevant theories. The steps that were followed to adapt the model are described below (Dickson & Emad, 2018).

Step 1: Data Collection: Questionnaires were designed and submitted to nurse students to gather quantitative data related to stress levels among study participants. Also, interview guide for key informants and focused groups was used for collecting qualitative data. For this, two (2) key informants (Dean and Head of Department) from each institution have been interviewed to assess students' stressors and to get information about availability of stress management program to cope with stress of students at school. Also, students' members of six (6) focused group interview to assess students' knowledge on stress, stressors and their coping mechanisms were interviewed. For collecting data, researchers used existing tools and the review of literature showed that Perceived Stress Scale and Coping Behaviour Inventory are valid and reliable instruments to assess Perceived Stress among medical and health professionals' students (Anna et al., 2021). Those tools are as follows, and they have been adapted to Rwandan

context by the researchers:

Questionnaire Instructions

- *Kindly respond respecting the specific instructions to closed questions.*
- *Summarize your opinion on the open question.*
- *Don't write your name on the questionnaire.*

Questionnaire to assess level of stress among students. Students' identification

Code Number:

Age in years:

Gender: Male

Female

Marital status: Married

Single Divorced

Separated Widowed

School:

Nursing program: Advanced diploma

Bachelor

Educational level: Year 1

Year 2 Year 3

Year 4

Upgrading

Employed: Yes

No

If yes, working place (Institution).....

Evaluation of stress level

Instruction: Encircle the options matching with you:

During last month, how frequently do you:	Rarely: Almost never	Sometimes: Once or twice each week	Often: Four or more times each week
Experience headaches?	1	3	5
Find it not easy to focus on work due to closing date or other responsibilities?	1	3	5
Eat, drink, or smoke for reducing anxiety or pressure?	1	3	5
Worry about your responsibilities at night and/or on weekends?	1	3	5
Lose sleep in the night thinking about things to do the next day?	1	3	5
Become disturbed due to things that have not been done correctly?	1	3	5
Tend to get irritable?	1	3	5
Lose sleep in the night and have difficulties in getting back to sleep?	1	3	5
Interrupt people while they are talking?	1	3	5
Forget about appointments or forget where you have placed some objects?	1	3	5
Get diarrhoea or constipation?	1	3	5
Feel very tired?	1	3	5
Get appetite changes?	1	3	5
Feel anxious?	1	3	5
Feel disorganized?	1	3	5
Totals	= ...	= ...	= ...
Grand total	=		

Other instructions:

Add the numbers from 15 items you circled.

Enter your score here: _____

Evaluate your score according to the following criteria:

Potential level of stress

- **Low** :34 or lower
- **Moderate** :35-42
- **High** :43-50
- **Very high** :51 or higher

Source: (McGraw-Hill Higher Education, 2011)

Questionnaire to identify possible stressors among students.

List the 5 most stressors to you, by indicating into (...) the number according to how much, the stressor accounts for you: N⁰1, N⁰2, N⁰3, N⁰4 and N⁰5.

Separation from family (...)

Academic workload (...)

Exams (...)

Roommates (...)

Financial issues (...)

Family problems (...)

Illness (...)

Peer pressure (...)

Competition (...)

Choosing career (...)

Future profession (...)

Any other? Specify:

Questionnaire to identify students' coping mechanisms.

Instructions:

- Listed below are some positive ways of reacting to stress.
- Check the following items and put **your** appropriate number accordingly: Never (1), Sometimes (3) and Often (5)

Response	Never	Sometimes	Often
Meditation	_____		_____
Doing muscle relaxation	_____		_____
Listening to music	_____		_____
Watching television or movies		_____	_____
Reading books		_____	_____
Attending health club		_____	_____
Sitting outside		_____	_____
Participating in recreational activity		_____	_____
Socializing with friends		_____	_____
Relax		_____	_____

- ✓ **Listed below are some negative ways of reacting to stress.**

Response	Never	Sometimes	Often
Acting aggressively	_____	_____	_____
Shouting at somebody	_____	_____	_____
Overeating	_____	_____	_____
Lack of appetite for long time	_____	_____	_____
Drinking lots of alcohol	_____	_____	_____
Drinking lots of coffee	_____	_____	_____
Smoking tobacco	_____	_____	_____

Spending time alone	_____	_____	_____
Biting fingernails	_____	_____	_____
Taking Valium or other drugs	_____	_____	_____
_____	_____	_____	_____
Totals	= ...	= ...	= ... Grand Total: ...

If grand total of negatives is greater than grand total of positives, you need to pay attention about

your stress level and you are advised to try positive responses for reducing your level of stress.

Focus group discussion guide to assess students' knowledge regarding stress.

What are the measures do you know for stress management?

What are positive effects of low level of stress in our life?

What are the complications of high level and prolonged stress you know?

Interview guide for Key Informants

Institution:

Position: Dean / Head of Department

Length of service on that positionyears

Questions

From your observations, what are the likely causes of stress among nurse students?

Is there any supportive mechanism put in place in your institution to support students coping with stress?

From your observations, what are the likely consequences of stress among the nurse students?

Step 2: Construction of conceptual meaning

Conceptual meaning was built by choosing the pertinent concepts from the results of the study and then formulation of criteria for the concepts followed. For choosing the concepts as building blocks for the model, the researcher adopted inductive theory-generative study design. The following elements assisted in choosing the concepts: the background to the study shows that, for the case of Rwanda, there is no research that has been done on stress among nursing students and adapting a model of stress management for students studying in selected schools of Nursing in Rwanda.

Theoretical orientation of the study: the study was based on Lazarus and Folkman's Stress, Appraisal, and Coping theory.

This theory was appropriate for the adaptation of model of stress management for students studying in selected schools of Nursing in Rwanda, as it describes the features of effective stress management program. It clearly states that, a stress management program could only be considered as efficient, once person's skill to lessen stressor is well evaluated, the related factors considered. Thus, during structuring and contextualizing the stress management model for targeted students' population, all the predetermined features were taken into consideration.

Step 3: Structuring and contextualizing the model.

After data collection and once conceptual meaning have been constructed, the stress management model was structured by establishing relationships between the chosen concepts. Structuring and contextualizing the model was done based on the existing theory stated as "Transactional Model" of Doctor Richard Lazarus and Doctor Suzan Folkman, and summarised as follows.

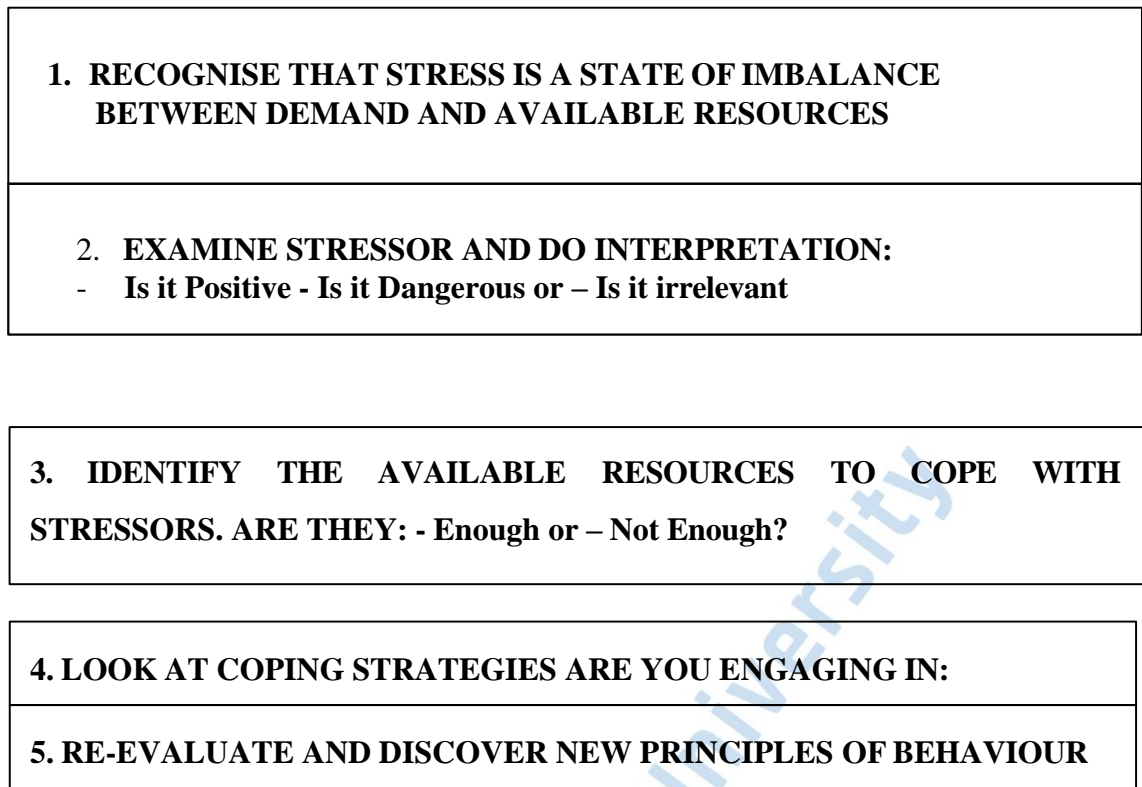


Figure 2: Summary of steps to use in Stress Management

Step 4: Validation and testing of the adapted model. Validation of the adapted model.

Model validation was done in the workshop with experts in nursing profession for checking the accuracy, and applicability of adapted model in management of stress among nursing students and propose the recommendations to improve it.

Signed Report of Validation Workshop of Stress Management Model for nursing students in

Rwanda

- ✓ **Date of Validation Workshop:** September 2nd, 2022.
- ✓ **Methodology of model validation:** Model validation was done in the workshop with experts in Nursing profession (Nursing education and Mental Health Nursing)
- ✓ **Purpose of validation workshop:** To check the accuracy, and applicability of

the adapted model “Stress Management Model for nursing students studying in Rwanda” and propose the recommendations to improve it.

✓ **Criteria for selecting workshop participants:**

The researcher used four criteria to select the participants in the validation workshop:

- Highest academic qualification in Nursing education and or mental health Nursing (PhD),
- At least 10 years’ experience in teaching, research and / or nursing practice,
- Working in academic institution and government health institution.
- With these criteria, we considered the participants as having nursing

professional knowledge and experience allowing them to review and propose the recommendations to improve Stress Management Model for nursing students in Rwanda.

In total, 4 nursing experts including 1 Professor of Nursing Education from University of Rwanda, 1

Mental Health nurse specialist from Rwanda Biomedical Center, 1 Associate Professor of community mental health from University of Rwanda and 1 Master’s prepared nurse educator from University of Rwanda, have been selected, invited and attended the workshop to validate the adapted model in management of stress among nursing students.

- ✓ **Presentation by PI:** the research principal investigator presented the research findings, followed by the original stress management model of Dr Richard Lazarus and Dr Suzan Folkman, then the adapted stress management model for nursing students in Rwanda, and the implementation plan for testing the stress management model among 39 nursing students in a selected University of Rwanda Campus.

✓ **Recommendations from the experts who attended the validation workshop:**

For improving the stress management model for nursing students in Rwanda, the participants gave the following recommendations:



- Match the concepts of the original model and the adapted model and indicate the added or removed concepts and explain why.
- When someone is highly stressed, she / he cannot do self-management: the model will be convenient to those with minor or moderate stress levels.
- Add the concept of stress appraisal.
- Intervention to manage the stress is not clear in the model. Add the intervention concept.
- The model shall have the following steps:
Step 1. Evaluate the stress.
Step 2. Appraisal:
Primary appraisal: Identifying the harm/health problems caused by the stress.
Secondary Appraisal: Identifying the resources /coping mechanisms to cope with the stress.
Step 3. Coping
Apply positive coping mechanisms. Discourage/Reduce/Abandon negative coping mechanisms.
Step 4. Reinforce: Re-evaluate and maintain the positive behaviours.
- Add the bi - directional arrows (going and coming back) between Step 1 and Step 2
- Add the bi - directional arrows (going and coming back) between Step 2 and Step 3
- Better to read the document related to interventional research. Example of authors: Thomas and Rockman.

✓ **Conclusion**

The PhD student has been requested to work on the above-mentioned recommendations and then proceed with the testing of the stress management model for nursing students in Rwanda.



✓ Attendance list

Names	Qualification	Position	Institution	Phone	Signature
Assoc. Prof Madeleine Mukeshimana	PhD in Nursing (Community health)	Assoc. Professor	University of Rwanda	+250785256459	
Prof Adejumo Oluyinka	PhD in Nursing	professor	University of Rwanda	+250784445859	
Doctor Jean Damascene Iyamuremye	PhD in Nursing (Mental Health Nursing)		Rwanda Biomedical Center	+250782299718	
Juliet Norah Mukankusi	MSN	Lecture	University of Rwanda	+250788443106	
Christine Nyirahabimana	PhD student in Nursing	Student	MKU – Nairobi Kenya	+250788650325	

Testing of the adapted model.

The self-management model for nursing students in Rwanda was tested among 39 nursing students of UR- Huye Campus (representing 10% of participants in the main study).

The model testing concerned only nursing students with low and moderate levels of stress.

When someone is highly stressed, she / he cannot do self-management: the model was convenient to those with low or moderate levels of stress, and those with high and

very high level of stress have been advised to consult the mental health specialist. The model was tested just to check if students are able to understand and use the model.

Tools used in testing the Stress Management Model for adaptation of nursing students in Rwanda.

Evaluation of stress level before implementation of stress management model

Instructions

- *Don't write your name on this form.*

Students' Identification

Code Number:

Age in years:

Gender: Male Female

Marital status: Married Single Divorced Separated Widowed

Educational level: Year 1 Year 2 Year 3

Employed: Yes No

Evaluation of Stress Level

Instruction: Encircle the options matching with you:

During last month, how frequently do you:	Rarely: Almost never	Sometimes: Once or twice each week	Often: Four or more times each week
Experience headaches?	1	3	5
Find it not easy to focus on work due to closing date or other responsibilities?	1	3	5
Eat, drink, or smoke for reducing anxiety or pressure?	1	3	5
Worry about your responsibilities at night and/or on weekends?	1	3	5
Lose sleep in the night thinking about things to do the next day?	1	3	5
Become disturbed due to things that have not been done correctly?	1	3	5
Tend to get irritable?	1	3	5
Lose sleep in the night and have difficulties in getting back to sleep?	1	3	5
Interrupt people while they are talking?	1	3	5
Forget about appointments or forget where you have placed some objects?	1	3	5
Get diarrhoea or constipation?	1	3	5
Feel very tired?	1	3	5
Get appetite changes?	1	3	5
Feel anxious?	1	3	5
Feel disorganized?	1	3	5
Totals	= ...	= ...	= ...
Grand total	=		

Other instructions:

Add the numbers from 15 items you circled.

Enter your score here: _____

Evaluate your score according to the following criteria:

Potential level of stress

- **Low** :34 or lower
- **Moderate** :35-42
- **High** :43-50
- **Very high** :51 or higher

Source: (McGraw-Hill Higher Education, 2011)

Evaluation of stress level after implementation of stress management model

Instructions

- *Don't write your name on this form.*

Students' Identification

Code Number:

Age in years:

Gender: Male Female

Marital status: Married Single Divorced Separated Widowed

Educational level: Year 1 Year 2 Year 3

Employed: Yes No

Evaluation of Stress Level

Instruction: Encircle the options matching with you:

During last month, how frequently do you:	Rarely: Almost never	Sometimes: Once or twice each week	Often: Four or more times each week
Experience headaches?	1	3	5
Find it not easy to focus on work due to closing date or other responsibilities?	1	3	5
Eat, drink, or smoke for reducing anxiety or pressure?	1	3	5
Worry about your responsibilities at night and/or on weekends?	1	3	5
Lose sleep in the night thinking about things to do the next day?	1	3	5
Become disturbed due to things that have not been done correctly?	1	3	5
Tend to get irritable?	1	3	5
Lose sleep in the night and have difficulties in getting back to sleep?	1	3	5
Interrupt people while they are talking?	1	3	5
Forget about appointments or forget where you have placed some objects?	1	3	5
Get diarrhoea or constipation?	1	3	5
Feel very tired?	1	3	5
Get appetite changes?	1	3	5
Feel anxious?	1	3	5
Feel disorganized?	1	3	5
Totals	= ...	= ...	= ...
Grand total	=		

Other instructions:

Add the numbers from 15 items you circled.

Enter your score here: _____

Evaluate your score according to the following criteria:

Potential level of stress

- **Low** :34 or lower
- **Moderate** :35-42
- **High** :43-50
- **Very high** :51 or higher

Source: (McGraw-Hill Higher Education, 2011)

Note: Put (X) in place which is matching with your response

Individual Questions	Strongly agree	Agree	Disagree	Strongly disagree
Stress Management Model is easy to understand				
It is possible to apply / to use the Stress Management Model in my daily life				
For me, the Model is effective / helpful in Stress Management				
I advise other nursing students to use the Stress Management Model in their daily life				

2.5 Summary

In sum, the review of literature focused on stress level, stressors, and coping mechanisms to deal with stress. No research has been done in Rwanda on stress management among nursing students. Furthermore, the researcher realized that there is no "Model of Stress Management" at nursing education institution level. Thus, the necessity of adapting the model of stress management at nursing institution level.

CHAPTER THREE: RESEARCH METHODOLOGY

3.0 Introduction

This chapter offers the study structure within which data were collected and analysed. It details the study design that was adopted, study population, study area, sample size, instruments, and methods for collecting data and techniques of data processing. Also, this chapter states how validity and reliability were tested and gives clarification in relation to ethical considerations.

3.1 Research design

The study was designed as cross-sectional descriptive study and used mixed method (both quantitative and qualitative approaches) for granting a better understanding of the research problem than either of each alone. The philosophical underpinning of the present study is from both positivist and interpretivist paradigms. Maslow's hierarchy of basic human needs states that there is order in satisfying human needs. First of all, individuals have to satisfy the most important needs for survival. These are biological and physiological needs such air, drink, food, elimination, sleep... Followed by safety needs that is protection from harmful elements, security, and stability. Then, belongingness and love needs composed of work in group, family, affection, relationships... At the next level, there is esteem needs in which individuals look for self-esteem, achievement, independence, dominance, responsibility, etc. At the highest level, there is self-actualization needs for realizing personal potential, creative activities... According to Maslow, only when the lower order needs of physiological and emotional well-being are satisfied, individuals are concerned with the higher order needs of influence and personal development. Conversely, if the things that satisfy the lower order needs are swept away, individuals are no longer concerned about the maintenance of the higher order needs. According to his model, some human needs are more

importance than others, and they must be met before others. Example: biological and physiological needs must be met before the needs of love and belongingness. The above mentioned human needs are compromised by stressful conditions of individuals' daily life. Managing stress is a basic human need, and literatures reveal that philosophy can offer a frame of thinking that may be very helpful in the management of daily life stressors. It is also obvious that philosophical approaches are used for manage the everyday stressful situations, but their effectiveness depends on relationship between them and the real life. Classen stated that "stress cannot be overcome through blind faith; stress is human-made and self-imposed, so it is up to the humans to come to terms with it and to develop effective strategies to handle this unnecessary psychological problem effectively" (Atlantic University, 2022).

Through the above philosophy of stress management for meeting the basic human needs, the researcher used inductive theory-generating approach and followed the steps from Lazarus and Folkman's Stress, Appraisal, and Coping theory to adapt a "Model of Stress Management" for students studying in selected schools of Nursing in Rwanda. Before model development, both quantitative and qualitative data were collected, and both positivist and interpretivist paradigms were used. The positivism was used in quantitative method to deal with numerical data related to the students' level of stress, to identify their possible stressors and their coping mechanisms while interpretivist was used in qualitative method to deal with subjective data from key informants about possible students' stressors and to get information on availability of stress management programs at school level. In addition, the concepts of ontology and epistemology were applied in the present study. Being the study of the existence, ontology was used in assessing what exists in terms of students' level of stress, possible stressors, coping mechanisms and availability of stress management programs at school level. In other

hand, being the study of knowledge and how it is acquired, epistemology was also applied in the present study in implementation level of adapted model for stress management among students attending some selected schools of nursing in Rwanda.

3.2 Target population

The study was conducted in selected higher institutions of nursing schools located in the Republic of Rwanda; namely, 1) University of Rwanda (UR), Rwamagana Campus located in Rwamagana District, Eastern Province and Huye Campus located in Huye District, Southern Province; 2) Mount Kenya University Rwanda (MKUR) located in Kicukiro District, Kigali City and 3) Ruli Higher Institute of Health (RHIH) located in Gakenke District, Northern Province. See appendix V: Map of Rwanda indicating the study areas. The population refers to the whole aggregation of cases, in which a researcher is interested. Study population is defined as entire number of units from which data can be collected. These units may be individuals, organization, events, or patients' records (Kader, 2006). The target population in this study was all registered undergraduate nursing students attending selected public and private nursing schools in Rwanda. The target population for this study to adapt the model of stress management was 1790 undergraduate nursing students.

Table 1: Study population

Selected nursing schools of Rwanda	Current number of undergraduates nursing students (Target population)
University of Rwanda (UR)	830 undergraduates general nursing students
Mount Kenya University Rwanda (MKUR)	660 undergraduates nursing students
Ruli Higher Institute of Health (RHIH)	300 undergraduates nursing students
Total	1790 undergraduates nursing students

In relation to the model testing, only nursing students with low and moderate levels of

stress were concerned, as when someone is highly stressed, she / he cannot do self-management. Thus, the model was tested with those with low or moderate levels of stress.

3.3 Sample size and sampling technique

3.3.1 Sample size determination

For estimating the sample from population, the following formula of Cuemath, 2013 was used (for quantitative data):

$$\text{Sample Size} = \frac{z^2 * p (1-p)}{e^2} / 1 + \frac{z^2 * p (1-p)}{e^2} * N$$

N = population size: 1970

z = z-score: 1.96

e = margin of error: 0.05

p = standard of deviation: 0.5

By using the above-mentioned formula, the sample size is 384 respondents from nursing students. The following is stratification of the sample according to the nursing schools.

Table 2: Stratification of the sample

Selected nursing schools of Rwanda	Current number of undergraduates students	Sample	Number of focused groups
University of Rwanda (UR)	830	$\frac{830 \times 384}{1790} = 179$	2
MKUR	660	$\frac{660 \times 384}{1790} = 141$	2
Ruli Higher Institute of Health (RHIH)	300	$\frac{300 \times 384}{1790} = 64$	2
Total	1790	384	6

Source: The researcher

For quantitative data, 384 students participated in the study to adapt the model of stress

management by filling the self-administered questionnaires to assess the students' level of stress, to identify their possible stressors and their coping mechanisms. From 179 nursing students who were attending University of Rwanda, 107 students were pursuing the Bachelor Degree program in sciences of nursing at Rwamagana Campus, and 72 students were pursuing the Advanced diploma program in sciences of nursing in Huye Campus. All 141 nursing students from Mount Kenya University Rwanda were pursuing the Bachelor Degree program in sciences of nursing, and 64 nursing students from Ruli Higher Institute of Health were pursuing the advanced diploma program in sciences of nursing. For qualitative data, two (2) key informants (Dean and Head of Department) from each selected institution were interviewed to assess students' stressors and to get information about availability of stress management program to cope with stress of students at school. Also, 59 students' members of 6 focused group interview were interviewed to assess students' knowledge on stress coping mechanisms and complications of stress, and each focused group was composed of 8 to 12 nursing students. Coming to the phase of model testing, the self-management model for nursing students in Rwanda was tested among 39 nursing students of UR- Huye Campus (representing 10% of participants in the main study). Only nursing students with low and moderate levels of stress were concerned, as when someone is highly stressed, she / he cannot do self-management of stress.

3.3.2 Sampling techniques

For collecting quantitative data, stratified sampling technique was used to choose the nursing students who completed the questionnaires for data related to their stress levels, stressors, and coping mechanisms. Even if the study population was composed by only nursing students, the researcher considered it as the heterogeneous population, and stratified sampling was considered to be the best sampling technique to be used in this

research for maximizing the level of representability and minimizing the risk of bias. The researcher divided the accessible population into homogeneous strata or homogeneous subgroups and then the research participants were selected. The strata were divided according to the following characteristics institutions (University of Rwanda, Mount Kenya University Rwanda, and Ruli Higher Institute of Health), nursing programs (Bachelor Degree program and Advanced diploma), educational level (Year 1, Year 2, Year 3, and Year 4), and gender (male and female) .

For collecting qualitative data, purposive sampling technique was used to choose two (2) key informants. Known also as “judgmental or authoritative sampling technique”, purposive sampling technique is based on purposes of researcher where subjects are chosen according to the specific purpose in the mind of researcher. It is in that background that from the above mentioned institutions, the Dean and Head of Department were interviewed about students’ stressors and availability of stress management program to cope with stress of students at school. Dean and Head of Department are the right person in the school of nursing who know the daily life of students and who are aware of any available program to support nursing students. Two

(2) focused group discussions from each institution were conducted. Each focused group was composed of 8 to 12 nursing students selected using convenience sampling technique. To assess students’ knowledge on stress coping mechanisms and complications of stress, 59 students’ members of 6 focused groups’ interview were selected using convenience sampling technique. Called also accidental sampling, convenience sampling is a non- probability sampling technique in which subjects are simply selected because they are easy to access. In this study, 59 students who participated in groups’ interview were selected from 384 students who completed questionnaires by simply asking those who still have time to participate.

Inclusion criteria are undergraduate students attending general nursing program in selected Rwandan public and private nursing schools for more than 6 months were involved in the study; students who were available during the time of data collection and students who signed the consent form. To be included in this study, students from these institutions have been chosen because all categories of general nursing students were represented: University of Rwanda as the public institution has 2 campuses which have undergraduate students (Huye and Rwamagana). Mount Kenya University Rwanda and Ruli Higher Institute of Health as the private institutions, one is in urban and another in rural area respectively. Exclusion criteria are newcomers (less than 6 months at school) and nursing students pursuing postgraduate programs were not part of this study.


3.4 Data collection methods

3.4.1 Data collection instruments

For this study, validated instruments were used: to determine the level of stress, Perceived Stress Scale was used, and Coping Behaviour Inventory was used to identify nursing students' stressors. Study participants completed the self-administered questionnaire in English. According to Audrey (2017), a questionnaire is a list of structured questions designed to collect information about attitudes, benefits, behaviours, and characters from respondents. In this study, questionnaires were used to collect quantitative data related to stress levels among nurse students, possible stressors, and their coping mechanisms. For collecting data, researchers used existing tools and the review of literature showed that Perceived Stress Scale and Coping Behaviour Inventory are valid and reliable instruments to assess Perceived Stress among medical and health professionals' students (Anna et al., 2021). Those tools have been adapted to Rwandan context by the researchers.

Table 3: Description of the stress and coping scales.

Stress scale	Parameters of testing	Meaning of stress scale
<p>Perceived Stress Scale (PSS): The level of stress among nursing students were assessed using overall assessment with help of 15 parameters situation.</p> <p>The PSS is a tool which is easy to understand as the questions parameters are of a general nature, and the interpretation is simple.</p>	<p>The 15 parameters of Perceived Stress Scale:</p> <p>During last month, how frequently do you:</p> <ul style="list-style-type: none"> -Experience headaches? -Find it not easy to focus on work due to closing date or other responsibilities? -Eat, drink, or smoke for reducing anxiety or pressure? -Worry about your responsibilities at night and/or on weekends? -Lose sleep in the night thinking about things to do the next day? -Become disturbed due to things that have not been done correctly? -Tend to get irritable? -Lose sleep in the night and have difficulties in getting back to sleep? -Interrupt people while they are talking. -Forget about appointments or forget where you have placed some objects? -Get diarrhoea or constipation? -Feel very tired? -Get appetite changes? -Feel anxious? -Feel disorganized? <p>Coding:</p> <ul style="list-style-type: none"> -Each nursing student was requested to encircle “1” if the parameter or feeling was rare or almost never for him or her -To encircle “3” if the parameter or feeling happened 	<p>After doing aggregation:</p> <ul style="list-style-type: none"> -Respondents -They were categorized as having moderate level of stress if they scored 35 to 42. -They were categorized as having high level of stress if they scored 43 to 50, and -They were categorized as having very high level of stress if they scored 51 or higher.

	<p>sometimes that is once or twice each week for him or her</p>	
	<p>-To encircle “5” if the parameter or feeling occurred often that is four or more times each week for him or her.</p> <p>Before doing interpretation related to the level of stress, nursing students were requested to add the numbers from 15 items they circled, so that everyone can get his or her total score.</p> 	
Coping scales	Parameters of Coping Behavior Inventory (CBI)	Meaning CBI
<p>Coping Behavior Inventory (CBI)</p> <p>The coping mechanisms adopted by nursing students were assessed using 10 parameters of Coping</p>	<p>Each nursing student was requested to check the items on a list of 10 positive ways of reacting to stress and other 10 negative ways of reacting to stress; and then to put the appropriate number accordingly.</p> <p>Coding instructions:</p> <p>-1: corresponds to when the student “never” adopts the concerned coping mechanism.</p> <p>-3: corresponds to when the student “sometimes” adopts the concerned coping</p>	<p>Each nursing student was requested to make the total score from each list. If the total of negatives is greater than the total of positives, the concerned student needs to pay attention about his / her stress</p>

<p>Behavior Inventory.</p> <p>This CBI had a total of 20 items divided into two subscales: a list of 10 positive ways of reacting to stress and a list of 10 negative ways of reacting to stress.</p>	<p>Beh mechanism.</p> <p>-5: corresponds to when the student “often” adopts the concerned coping mechanism.</p> <p>Positive coping mechanisms: meditation, doing muscle relaxation, listening to music, watching television or movies, reading books, attending health club, relax, participating in recreational activity, socializing with friends, sitting outside.</p> <p>Negative coping mechanisms: acting aggressively shouting at somebody, overeating lack of appetite for long time, drinking lots of alcohol drinking lots of coffee, smoking tobacco spending time alone biting fingernails, taking valium or other drugs.</p>	<p>level and is advised to try positive coping mechanisms and reduce the negative coping mechanisms.</p>
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Interview guide for Dean and Head of Department was composed of 2 main questions about students’ stressors and availability of stress management program to cope with stress of students at school. For students’ FGD, the 2 main questions were to explore their knowledge about stress management measures and complications of stress.

3.4.2 Procedures of data collection

During this study, both quantitative and qualitative methods were used. For this, self-administered questionnaires and interview guides were used. Quantitative data consisted of information collected using different tools to determine the level of stress among

nursing students. Quantitative data was collected using Perceived Stress Scale and Coping Behaviour Inventory questionnaire. It was a self-administered questionnaire in English to collect quantitative data related to stress levels, stressors and coping measures adopted by nurse students. In this study, qualitative approach was used to collect in-depth knowledge level of the informants regarding stress. Also, two (2) key informants (Dean and Head of Department) from each institution were interviewed to assess students' stressors and to get information about availability of stress management program to cope with stress of students at school. We used an interview guide to collect data. After getting ethical clearance from Mount Kenya University Institutional Review Board, the researcher requested permission to conduct research within University of Rwanda (UR), Mount Kenya University Rwanda (MKUR) and Ruli Higher Institute of Health (RHIH). Once the permission was granted, some participants have been met at their respective schools with the assistance of nursing schools' leaders; and others who were in clinical placements have been met in the health facilities (hospitals or health centers) with the help of health facility administration and clinical instructors. Once the researcher was with nursing students, the strata or subgroups have been created taking into consideration nursing programs (Bachelor Degree program and Advanced diploma), educational level (Year 1, Year 2, Year 3, and Year 4), and gender (male and female). This was done to maximize the level of representativeness. Nursing students research participants have been explained that the information given during this research is for academic purpose only and the principle of confidentiality will be extremely respected, and that their participation will be highly appreciated. The research participants have been also informed that no known risks, nor immediate benefits for participation, that they are free to participate or withdraw from the research at any time. Those who agreed, signed the consent form to fill the self-administered questionnaire

and to participate in interview. To complete the questionnaires took between 25 to 30 minutes and questionnaires were taken back immediately.

For assessing the students' knowledge on stress coping mechanisms and complications of stress, two (2) focused groups discussions from each institution were conducted. Each focused group was composed of 8 to 12 nursing students selected using convenience sampling technique. In total, 59 students' members of 6 focused groups' interview were selected using convenience sampling technique. The above mentioned 59 students who participated in groups' interview were selected from 384 students who completed questionnaires by simply asking those who still have time to participate. Each session of focused groups' interview took between 10 to 15 minutes. In other hand, for key informants' interview, 2 key informants have been contacted face to face, and other 4 contacted through phone interviews. The process of qualitative data analysis was begun with data collection, where in-depth data was generated from the interview. The whole process of data collection took the period of 4 months from February to May 2022, and the main challenge was the availability of study participants. After that, a "Model of Stress Management" for the targeted population of nursing students was adapted. For model adaptation, the researcher used inductive theory-generating approach and followed the steps from Lazarus and Folkman's Stress, Appraisal, and Coping theory. The researchers chose the inductive approach because the model adaptation was based on the results from the collected data.

Adaptation of Stress Management Model for nursing students in Rwanda

The Stress Management Model for nursing students in Rwanda was adapted based on the existing theory stated as "Transactional Model" of Doctor Richard Lazarus and Doctor Suzan Folkman, and the following table shows the concepts as building blocks for the model. In both, original and adapted model, the concepts are the same (stress,

appraisal, and copying). The difference is at implementation level, where for the adapted model, nursing students are advised to put more emphasize on reinforcement by encouraging and repeating positive copying mechanisms and discouraging negative copying mechanisms. On regular basis, each nursing student should have a time for self-evaluation to verify if there is effectiveness of reinforcing the positive strategies and then maintain positive behaviours.

Table 4: Description of Concepts in Stress Management Models

Transactional Model by Doctor Lazarus and Doctor Folkman	Stress Management Model for nursing students in Rwanda
<p>Stress: Level of stress</p> <p>Appraisal:</p> <p>-Primary appraisal: Understanding the harm caused by the stress</p> <p>-Secondary appraisal: identifying available resources</p> <p>Coping:</p> <p>-Problem-focused coping and</p> <p>-Emotional focused coping</p>	<p>Stress: Evaluating the level of stress</p> <p>Appraisal:</p> <p>-Primary appraisal: understanding the harm/health problems caused by the stress</p> <p>-Secondary appraisal: Identifying the resources/coping mechanisms to cope with the stress</p> <p>Coping:</p> <p>Applying the positive mechanisms</p> <p>Reduce the negative coping mechanisms</p> <p>Reinforce:</p> <p>Encourage the positive mechanisms</p> <p>Discourage the negative coping mechanisms</p> <p>Re-evaluate the stress, repeat the positive coping mechanism (s) and make it (them) habits (maintain the behaviour)</p>

3.5 Reliability and Validity

Reliability refers to the consistence of the study instruments. The distribution of questionnaires was done in two stages. First stage was the pilot study carried on before the main study. The pilot study was conducted from 39 selected nursing students, representing 10% of participants of the main study. It was done at Rwamagana School of Nursing, and those 39 students were not included in the main study. The main objective of the pilot study was to find out the consistence of the study tools before being used in the main study. The reliability was measured by using Cronbach's coefficient alpha that was based on the mean correlation of each factor. Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group. A general rule for measuring reliability is if Alpha is above 0.70. Alpha above 0.60 is probably reliable but it should be considered how eliminating some elements from the tools to increase its consistency. Each variable was measured, the study obtained the reliability coefficient of 0.78 and this indicate higher consistence of the study tools. In addition, as existing tools, the review of literature showed that the PSS is a valid and reliable instrument to assess Perceived Stress among medical and health professionals' students (Anna et al., 2021). In other hand, the validity means that instrument is exactly measuring what it is intended to measure. For this study, the researchers used the existing validated tools: Perceived Stress Scale and Coping Behaviour Inventory were used as study instruments.

The validation of Stress Management Model for adaptation by nursing students in Rwanda was done in the workshop of experts and the signed validation report is attached as appendix XIII. For the methodology of model validation, the model validation was done in the workshop with experts in nursing profession. The purpose of validation workshop was to check the accuracy, and applicability of adapted model in

management of stress among nursing students and propose the recommendations to improve it. Criteria for selecting workshop participants were as follows: 1) highest academic qualification in Nursing education and or mental health Nursing (PhD), 2) at least 10 years' experience in teaching, research and / or nursing practice, 3) working in academic institution and / or in the government health institution. With these criteria, the researcher considered the participants as having nursing professional knowledge and experience allowing them to review and propose the recommendations to improve Stress Management Model for nursing students in Rwanda. A total of 4 nursing experts including 1 Professor of Nursing Education from University of Rwanda, 1 Mental Health nurse specialist from Rwanda Biomedical Center, 1 Associate Professor of community mental health from University of Rwanda and 1 Master's prepared nurse educator from University of Rwanda, have been invited and attended the workshop to validate the Stress Management Model for adaptation by nursing students in Rwanda. On the day of the validation workshop, the research principal investigator presented the research findings, followed by the presentation and explanation of the original stress management model of Dr Richard Lazarus and Dr Suzan Folkman. Then the adapted stress management model for nursing students in Rwanda was explained, and also, the research principal investigator presented the implementation plan for testing the stress management model for adaptation of nursing students in Rwanda.

After thorough discussion about the stress management model adapted for nursing students in Rwanda, the experts who attended the model validation workshop formulated the recommendations. For improving the stress management model for adaptation by nursing students in Rwanda, the experts in nursing formulated the following recommendations: 1) match the concepts of adapted model and the concepts in plan of the model testing, 2) when someone is highly stressed, she / he cannot do

self-management; thus, the model will be convenient to those with minor or moderate stress levels, 3) add the concept of stress appraisal, 4) intervention to manage the stress is not clear in the model, 5) Add the intervention concept, 6) the model shall have the following steps: step 1.

Evaluate the stress, step 2. Appraisal: primary and secondary appraisal, step 3. Coping: apply positive ways and discourage negative ways, step 4. Reinforcement and re-evaluation for maintaining the positive behaviours. In addition to the above mentioned recommendations, the members of the model validation workshop recommended to add the bi - directional arrows (going and coming back) between Step 1 and Step 2 of the model, and other bi - directional arrows (going and coming back) between Step 2 and Step 3 of the model to manage stress among nursing students. The members of the workshop validated the Stress Management Model for adaptation by nursing students in Rwanda, and the researcher has been recommended to test the model after implementing the workshop recommendations.

3.6 Data analysis

Once data collected, their storage was done by using computers and other devices like flash disk, Memory cards and DVDs. For the quantitative data analysis, the data were analysed by being sorted out and entered for analysis using SPSS (version 23). Descriptive analysis was used to analyse and present data using tables and charts. Furthermore, Chi Square test, correlation and linear regression were based on in establishing the relationship between variables. The process of qualitative data analysis was begun with data collection, where in-depth data was generated from the interview, and qualitative data were analysed through “thematic analysis” as predetermined by Ritchie and Spencer (2013). The data was complemented with the observational notes. Data collection and analysis in qualitative study went hand in hand and were done

simultaneous. The analysis of qualitative data was done using analysis of the content, and the following skills have been utilized throughout the process that is active listening, by reflecting on what is being said, request for clarification where necessary and intuition was also used during the interview process by asking the real life examples. Both voices recordings and transcripts have been used to ensure the accurate collection of information needed. In data analysis, the information taken during interview and summary notes written immediately after the interview were read and re-read for getting familiar with them. Field data from interviews were cleaned up and organised and arranged according to themes and sub-themes, and the relationships among the themes were established. The researchers also used the “voices” in the text: these are the messages given by the respondents and reported literally. In this study, the reference codes served the function of identifying specific information in the text and this helped to easily locate it. Then, the interpretation and generalisation followed: this required good analytical, interpretative, and writing skills from the side of the researcher. The data analysis was followed by the report writing. The report gives the clear description of the situation under study. It shows the relationships between the studied variables with explanations from the data. The descriptions, analysis of relationships and explanations led to some statements which used in development of stress management model for nursing students in Rwanda. Use of those quotations made the report rich, real, very informative as it expresses various feelings and attitudes from the study respondents. The model was tested just to check if students are able to understand and use the model. The findings of the model testing were presented as qualitative data showing the enthusiasm of participants through participants’ citations.

3.7 Ethical Considerations

As stated by Mugenda & Mugenda (2009) in their work on “Research methods”, the researchers are persons concerned about others’ lives; they should be individuals of integrity who will not carry out study for personal interest or study that will have negative consequences on the study participants or other related people. Ethical clearance was sought from Mount Kenya University Institutional Review Board and the researcher requested permission to conduct research within University of Rwanda (UR), Mount Kenya University Rwanda (MKUR) and Ruli Higher Institute of Health (RHIH). During this study, respecting the rights of the participants was considered by adhering to the following principles of ethics in research: beneficence (right to be protected from any harmful interventions), non-maleficence (right to be protected from any form of exploitation), informed consent, justice, confidentiality through anonymity. In data collection process, all the above principles were taken into consideration: The participants have been explained the purpose of the research, signed the consent form to fill the self-administered questionnaire and to participate in interview. The information given during this research are for academic purpose only. The participants have been assured of the anonymity of their identity and confidentiality of responses. They were free to participate or withdraw from the research at any time. In addition, the researcher took into consideration the scientific integrity by acknowledging the sources for the data used.

CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSION

4.0 Introduction

This chapter presents research findings, analysis, and interpretation. In addition, it covers discussion of results which is guided by research objectives and questions.

4.1 Research presentation and interpretation of results Demographic characteristics of respondents.

Table 4. 1: Socio-demographic characteristics of respondents

Variables	Frequency	Percentage
Age groups		
<25 Years	243	63%
25-29 Years	75	20%
30-34 Years	29	7%
35 and above	37	10%
Gender		
Female	223	58%
Male	161	42%
Marital status		
Married	139	36%
Single	242	63%
Widow	3	1%
Schools		
MKUR	141	37%
Ruli	64	16%
UR Huye campus	72	19%
UR Rwamagana campus	107	28%
Program		
Advanced diploma	178	46%
Bachelor	206	54%
Level of education		
Year 1	77	20%
Year 2	103	27%
Year 3	42	11%
Year 4	162	42%
Employment status		
Employed	108	28%
Not employed	276	72%

Of the 384 university students enrolled in this study, all have accepted to participate in the study, with a 100% response rate. Young participants below the age of 25 predominate the study population with more than sixty percent of the total population (63%). More than half of the population was female (58%) and most of them were single (63%). UR (Rwamagana and Huye campuses) have 47% of the students enrolled in the present study and most of the respondents (54%) are following bachelor program in nursing with 42% of them in their last year of studies (Year 4). With regards to employment, 72% of students are not employed.

4.2 Presentation of quantitative findings

Level of stress, coping mechanisms and reactions to stress among respondents

Table 4. 2: Level of stress and coping mechanisms.

Variable list	Frequency	Percentage
Level of stress		
Low (≤ 34)	243	63.28
Moderate (35-42)	92	23.96
High (43-50)	29	7.55
Very high (≥ 51)	20	5.21
Positive Coping mechanism scores		
Never	119	30.98
Sometimes	169	44.00
Often	96	25.02
Negatively reacting		
Never	295	76.93
Sometimes	14	3.80
Often	74	19.27

As indicated in Table 4.2, there has been a great variation between the levels of stress encountered by study participants. The level of stress among participants were assessed using overall score assessment with help of 15 parameters of Perceived Stress Scale. The possible smallest score was 1 coded as rare, the intermediate score was 3 coded as sometimes and the maximum was 5 coded as often. After doing aggregation,

respondents were categorized as having low level of stress if they scored 34 or lower. They were categorized as having moderate level of stress if they scored 35 to 42. They were categorized as having high level of stress if they scored 43 to 50, and they were categorized as having very high level of stress if they scored 51 or higher.

Only 63.2% of respondents scored a low level of stress while, the results indicated that 23.9% of participants scored moderate level of stress, and (12.7%) scored a high to very high levels of stress. This indicate that nursing students experience stress while at schools. In the context of this study, coping mechanism refer to all strategies, behavioural and psychological efforts undertaken by students enrolled in nursing program to manage stress. In this regard, refer to positive coping mechanism to make distinction with those that can lead individuals into negative activities such as alcohol abuse, and a mental state that keeps them from directly addressing stressful events in a proper way. Therefore, the coping mechanisms were assessed using 10 parameters of Coping Behaviour Inventory. The possible smallest score was 1 coded as never, score 3 for sometimes, and score 5 for often. After aggregating and converting them into percentages, it was found that 44% of respondents do not always use the positive coping mechanisms, but use them sometimes, compared to 25% who uses them often, and 30.9% who never use positive coping mechanisms. In addition, 19% (n=74) of respondents use often negative reactions or actions once exposed to a stress level. This indicates that nursing students use both positive and negative coping mechanisms if stressed.

Table 4. 3: Top five stressors as expressed by respondents

Stressors	Rank	Frequency (n)	Percentage (%)
Exams	First	86	22
Financial issue	Second	81	21
Academic workload	Third	59	18
Illness	Fourth	56	15
Family problem	Fifth	48	13
Total stressors		330	89

In a list of 12 potential items, each respondent was asked to list and rank the top 5 stressors. For this study, 22% (n=86) of respondents ranked exams as the first stressor, followed by financial issues (21%, n=81), academic workload (18%, n=59), illness (15%, n=56) and family problems (13%, n=48) as the fifth stressor.

Table 4. 4: Association of level of stress with socio-demographic characteristics and potential stressors

Variables	High n (%)	Low n (%)	Moderate n (%)	Very high n (%)	p-value
Age groups					
<25 years	14 (5.76)	157 (64.61)	58 (23.87)	14 (5.76)	
25-29 Years	9 (12)	50 (66.67)	13 (17.33)	3 (4)	0.025
30-34 Years	0 (0)	14 (48.28)	12 (41.38)	3 (10.34)	
35 and above	6 (16.22)	22 (59.46)	9 (24.32)	0 (0)	
Gender					
Female	26 (11.66)	136 (60.99)	48 (21.52)	13 (5.83)	0.003
Male	3 (1.86)	107 (66.46)	44 (27.33)	7 (4.35)	
Marital status					
Married	6 (4.32)	97 (69.78)	33 (23.74)	3 (2.16)	0.104
Single	23 (9.5)	143 (59.09)	59 (24.38)	17 (7.02)	
Widow	0 (0.0)	3 (100.00)	0 (0.0)	0 (0.0)	
Schools					
MKUR	12 (10.17)	74 (62.71)	29 (24.58)	3 (2.54)	0.010
Ruli	6 (5.66)	79 (74.53)	16 (15.09)	5 (4.72)	
UR Huye campus	3 (4.17)	39 (54.17)	27 (37.5)	3 (4.17)	
UR Rwamagana campus	8 (9.09)	51 (57.95)	20 (22.73)	9 (10.23)	
Program					
Advanced diploma	9 (5.06)	118 (66.29)	43 (24.16)	8 (4.49)	0.315
Bachelor	20 (9.71)	125 (60.68)	49 (23.79)	12 (5.83)	
Level of education					

Year 1	3 (3.9)	48 (62.34)	22 (28.57)	4 (5.19)	
Year 2	4 (3.88)	66 (64.08)	25 (24.27)	8 (7.77)	0.244
Year 3	6 (14.29)	26 (61.9)	10 (23.81)	0 (0)	
Year 4	16 (9.88)	103 (63.58)	35 (21.6)	8 (4.94)	
Employment status					
Employed	12 (11.11)	68 (62.96)	25 (23.15)	3 (2.78)	0.234
Not employed	17 (6.16)	175 (63.41)	67 (24.28)	17 (6.16)	
Exams					
Yes	8 (9.88)	57 (70.37)	11 (13.58)	5 (6.17)	<u>0.096</u>
Other stressors	21 (6.93)	186 (61.39)	81 (26.73)	15 (4.95)	
Family problems					
Yes	12 (21.43)	21 (37.5)	15 (26.79)	8 (14.29)	<u><0.001</u>
Other stressors	17 (5.18)	222 (67.68)	77 (23.48)	12 (3.66)	
Illness					
Yes	3 (5.08)	40 (67.8)	9 (15.25)	7 (11.86)	<u>0.030</u>
Other stressors	26 (8.00)	203 (67.68)	83 (23.48)	13 (3.66)	
Financial issues					
Yes	7 (8.14)	48 (55.81)	29 (33.72)	2 (2.33)	<u>0.066</u>
Other stressors	22 (7.38)	195 (65.44)	63 (21.14)	18 (6.04)	
Academic workload					
Yes	6 (12.5)	34 (70.83)	8 (16.67)	0 (0)	<u>0.096</u>
Other stressors	23 (6.85)	209 (62.2)	84 (25)	20 (5.95)	

Regarding stress levels and association with other factors; age group ($p=0.025$), gender ($p=0.003$), school ($p=0.010$), and family problems ($p<0.001$) showed a statistically significant association with the stress level. Participants in the age group below 25 years old showed more stress level, ranging from moderate to high levels 23.87% and 11.52% respectively. There is a statistical significance between level of stress and gender ($p=0.025$). Female participants exhibit higher levels of stress compared to their counterparts. More than 17% demonstrated high to very high level of stress combined (17.49%, $n= 39$). Although all respondents exhibit a certain level of stress, males were the most moderately stressed (27.3%, $n=44$) compared to females. The school where participants study was associated with the level of stress ($p=0.010$). Higher to very higher levels of stress were reported by participants who study at UR Rwamagana

campus (19.3%, n=17), and MKUR (12.7%, n=15). In addition, family problems ($p<0.001$), exams ($p=0.096$), illness (0.030), financial issues ($p=0.066$) and academic workload ($p=0.096$) was significantly associated with the level of stress. However, among participants who reported family problems as a potential stressor, 62.5% (n=35) was experienced moderate to very high level of stress. Participants who reported illness as a potential stressor 32.1% (n=19) has had moderate to very high level of stress. Close to thirty percent (29.6% n=24) of participants who reported exams as potential stressor experienced moderate to very high level of stress.

4.3 Presentation of qualitative findings

4.3.1 Knowledge of participants about stress management measures and complications of stress (n=6 FGDs)

To assess the knowledge of participants with regards to stress management and complications of stress, the researcher used a 3-items of the FGD. One being the measures of stress management, the second being the positive effect of low level of stress in one's life, and the third being the complications of high level and prolonged stress. Therefore, 3 themes were created, and categories were created under each theme. As for this, 5 categories were created in the first theme, 2 categories under the second theme, and 4 categories were created under the third theme. Emerging responses from each category are presented using verbatim quotes of respondents within groups.

4.3.2 Theme 1: Participants' knowledge about measures for stress management

Category 1-Sport: Sport was presented by all members during the FGD as one of measures contributing to manage stress among students in nursing schools.

“What I know as measure to manage stress is sport. For example, if I feel something which is not going well in my dairy life, I know that going in sport ground can reduce the stress and if I do so, I use to come back

comfortable". FGD-3S1.

Category 2-Isolation: During the FGD, isolation was emerged among others as a solution to adopt as a responsive measure once someone faces stress.

"I think that if someone is stressed can go in isolated place and take rest. That can help her / him to think deeply about the situation and take decision accordingly". FGD-6S1.

Category 3- Avoidance: Majority of respondents in FGD has quoted avoidance as one of the measures of stress management among students in nursing schools. Study participants believe that forgetting the situation may help though require more energy and not merely bring success.

"Another way of coping with stress is to try to forget the situation with causes the embarrassing state in yourself. For more explanation, I want to say that trying to escape the cause of stress can help but, it requests more energy, and it may fail". FGD-4S1.

Category 4- Meditation: Respondents in FGDs quoted meditation as a coping mechanism to stress among nursing students. They believe in faith, that playing would alleviate the stressful situation.

"According to one's faith, go to the church and pray can be also one of the strategies to cope with stressful situation. If going to the church is not possible, you can join the prayer group where you can sing the prayer songs, read the bible verses. This help also" FGD-2S1.

Category 5- Listen to music: Listening to music especially the favourite one, was quoted as a way of reducing stressful situation for students in nursing schools.

"I have read in one textbook that listening to the favourite songs can strongly reduce the stress".

FGD-4S1.

4.3.3 Theme 2: Participants' knowledge about complications of high level and prolonged stress

Category 1- Depression: Participants in FGDs testified that higher level of stress is harmful and that can lead to depression, once not properly managed.”

It is understandable that high level and prolonged stress is very dangerous to our health. It leads people in hopelessness situation and then depression if the stress is not managed”. FGD-6S3.

Category 2- Chronic diseases: Chronic diseases were also identified as one the effect of higher level and prolonged stressful conditions. Participants in FGDs mentioned chronic headache and blood pressure among others because of stress.

“I, too, consider high level and prolonged stress as life threatening because, it disturbs the normal functioning of body systems and different chronic diseases follow namely high blood pressure, chronic headache, skin diseases and others even death can occur”. FGD-2S3.

Category 3-Sleep disturbances and drug abuse: Sleep disruption and drug abuse can also be one of the results of higher level of stress as quoted by participants in FGDs. Students who are stressed may lose sleep for many nights.

“I know a family member who lost her husband. From that time, she lost sleep, she passed so many days without sleeping and finally for sleeping at least few hours in night she became dependent to alcohol”. FGD-4S3.

Category 4-Social problems: Higher level of stress was quoted as one negatively affecting the social relationship with others. Not only a student, but also his/her surrounding may suffer the consequences of stress.

“In addition to the complications of high level and prolonged stress,

above mentioned by my colleagues, I want to add social problems. Those social problems are mainly related to the irritability. For instance, in family, if a mother is stressed, all family members may suffer if she

Findings from Key Informants (n=6 KIIs)

becomes irritable". FGD-3S3.

In this study, two (2) key informants from each selected institution were interviewed to assess students' stressors and to get information about availability of stress management program to cope with stress of students at school.

4.3.4 Theme 1: Causes of stress among nursing students.

- **Category 1: Nature and organization of nursing courses** (stated by all 6 / 6 KI)

"Internationally, nursing courses are organized in special manner. Theory classes, skills labs sessions followed by OSCE and clinical placements at different levels of health care settings followed also by practical exams make nursing academic workload very heavy than other courses. That structure of nursing program requests nursing schools to cover long period (academic year) than other schools; and nursing students are often requested to work even extra hours, nights, and weekends. More stress is exhibited in preparing and during Nursing Council licensing exams. That nature and organization of nursing courses cause too much stress to nursing students".

- **Category 2: Tuition fees is high in Nursing schools** (stated by 4 KI

"I am with nursing students for more than 15 years. The organization of nursing courses (theory classes, skills labs sessions and clinical placements) make them very expensive than other courses. Difficult and expensive living conditions during their clinical practice also increases the stress to nursing

students”.



- **Category 3: Multiple responsibilities** (stated by 3 KI)

“Some students have multiple responsibilities especially those attending upgrading nursing program. In addition to the responsibility of being students, they are also full-time nurses in health centers or hospital. Furthermore, most of them are married (mothers or fathers in families). To combine the above-mentioned responsibilities is not easy and I use to see them overloaded”.

4.3.5 Theme 2: Supportive mechanisms put in place to support students coping with stress.

- **Career guidance and counselling center** (stated by 5 KI)

“In our institution, we have the office of the Director of students’ Welfare, the Director of Career and Guidance and the Students’ Guild Council, all responsible to assist students with social issues in addition to career guidance and counselling for students in needs”.

- **Playgrounds** (stated by 4 KI)

“Our students have opportunities to relax by joining the playgrounds for football, basketball, volleyball or by joining prayer groups and choirs. Unfortunately, most of nursing students do not join the above-mentioned groups due to their heavy workload”.

4.3.6 Theme 3: Consequences of stress among nursing students

- **Poor Performance** (stated by 6KI)

“Nursing curriculum is designed in a special manner which causes stress to the students. If X student do not know how to manage stress, absolutely, she / he exhibit poor performance and failure. Thus, there is a need of a special program to assist nursing students coping with stress in their journey towards

our noble profession”.

4.3.7 Stress Management Model for nursing students in Rwanda

The Stress Management Model for nursing students in Rwanda was adapted based on the existing theory stated as” Transactional Model” of Doctor Richard Lazarus and Doctor Suzan Folkman.



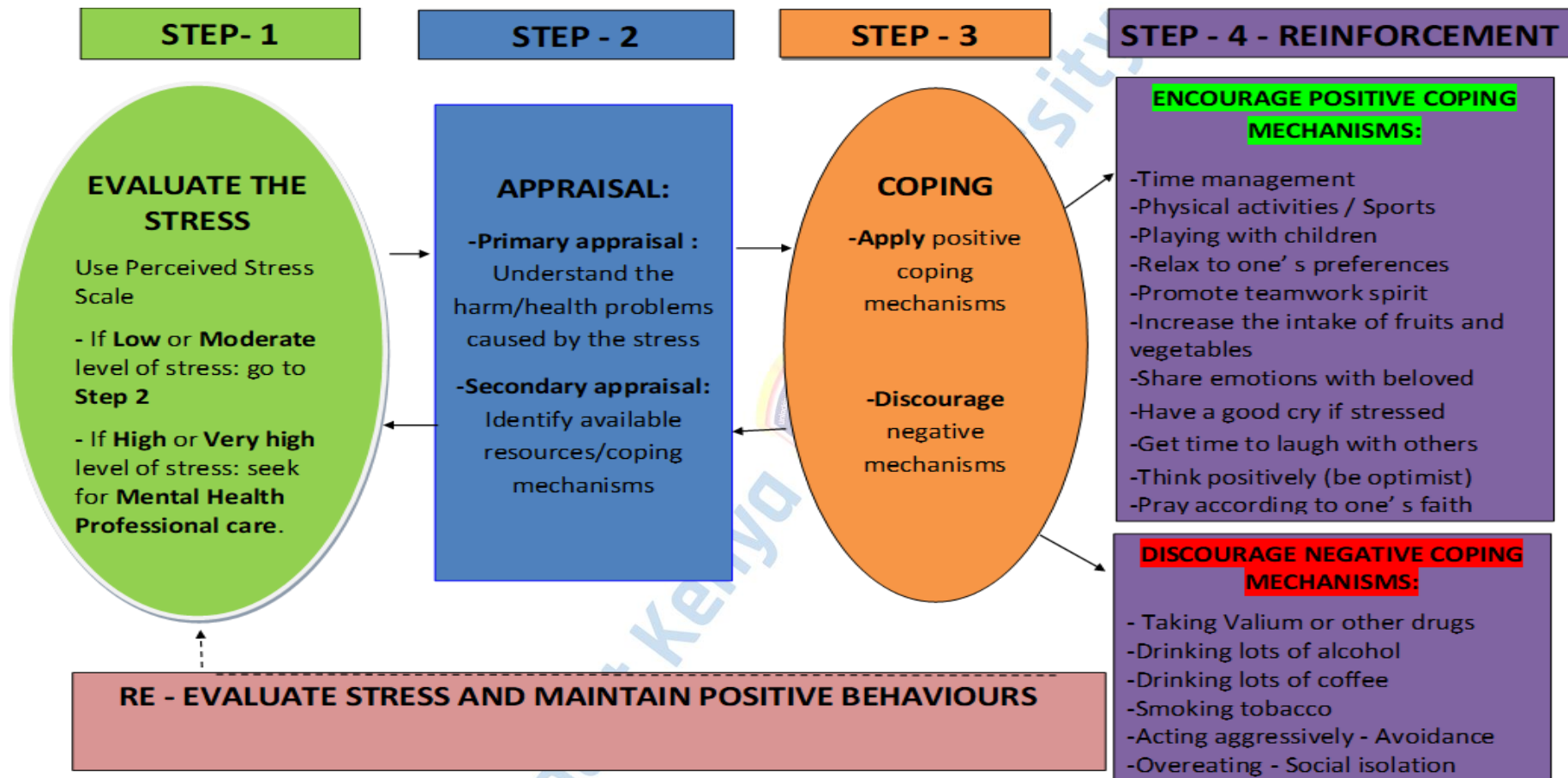


Figure 3: Stress Management Model adapted from "Lazarus and Folkman Transactional Model" for nursing students in Rwanda

4.4 Description of Stress Management Model for adaptation by nursing students in Rwanda

The Stress Management Model for nursing students in Rwanda (Figure 4) was adapted based on the existing theory stated as "Transactional Model" of Doctor Richard Lazarus and Doctor Suzan Folkman, and it has 4 major steps:

4.4.1 Step 1. Evaluate the stress.

Nursing students shall use the Perceived Stress Scale to evaluate stress level.

If she / he scored low or moderate level of stress, she / he will pass to Step 2 of the Self- Management Model.

In case of high or very high levels of stress, the nursing student is advised seek for Mental Health Professional care.

Step 2. Appraisal

Primary Appraisal: identifying the harm/health problems caused by the stress.

Secondary appraisal: identifying the available resources / what can be done to cope with the stress.

Step 3. Coping

Applying the positive coping mechanisms.

Reduce the negative coping mechanisms.

Steps 4. Reinforcement:

Encourage the positive coping mechanisms to cope with stress.

The following are some positive coping strategies: they should be reinforced to become habit and then culture.

Time management: Give priority to important actions, do those first, schedule time for both work and recreation: absolutely, the day will include less anxiety.

Body exercises or physical activities including playing with children: when you feel nervous, angry or upset, release the pressure through body exercise or physical activity.

Relax according to one's preferences.

Promote teamwork spirit: perform activities involving others to avoid social isolation: a good way to combat sadness, boredom and loneliness is to perform activities involving others.

Balanced diet with increased fruits and vegetables: the well-nourished bodies will cope better with stress.

Share emotions with beloved one: bottled up emotions increase frustration and stress. Talking with someone else can help to clear your mind of confusion.

Have a good cry during periods of stress: a good crying during periods of stress can be a healthy way to bring relief to your anxiety, and it might prevent a headache or other physiological consequences.

Get opportunities to laugh with others by maintaining our sense of humour, including the ability to laugh with others.

Think positively (being optimist): the optimist sees opportunity in every difficult situation, but the pessimist sees difficulties in every opportunity

Pray according to one's faith (meditation): reading Bible and offering prayers provide positive role models.

Discourage the negative coping mechanisms.

Naturally, in case of stress, there is automatically a coping strategy adopted: negative or positive. The following are some negative coping strategies, and nursing students are advised to discourage them:

Taking Valium or other drugs

Drinking lots of alcohol: avoid alcohol and smoking: alcohol and other drugs do not reduce stress. Although they may mask the problems, and researchers found that alcohol and tobacco increase stress instead of decreasing it.

Drinking lots of coffee - Smoking tobacco - Acting aggressively

Avoidance: trying to forget the embarrassing situation.

Overeating - Social isolation

Re-evaluate stress and maintain positive behaviours.

On regular basis, each nursing student should have a time for self-evaluation to verify if there is effectiveness of reinforcing the positive strategies and then maintain positive behaviours.

Validation of Stress Management Model for adaptation by nursing students in

Rwanda

(signed validation report in appendixes.

Methodology of model validation: Model validation was done in the workshop with experts in nursing profession.

Purpose of validation workshop: To check the accuracy, and applicability of adapted model in management of stress among nursing students and propose the recommendations to improve it.

Criteria for selecting workshop participants: four (4) experts in nursing who are essential to achieve the above-mentioned purpose. They have nursing professional knowledge and experience allowing them to review and propose the recommendations to improve Stress Management Model for adaptation by nursing students in Rwanda.

Presentation by PI: the research principal investigator presented the research findings, followed by the original stress management model of Dr Richard Lazarus and

Dr Suzan Folkman, then the adapted stress management model for nursing students in Rwanda, and the implementation plan of stress management model for adaptation of nursing students in Rwanda.

Recommendations from the experts who attended the validation workshop:

For improving the stress management model for adaptation by nursing students in Rwanda, the experts in nursing formulated the following recommendations:

Explain the methodology of model validation workshop.

Match the concepts of adapted model and the concepts in plan of the model testing.

When someone is highly stressed, she / he cannot do self-management: the model will be convenient to those with minor or moderate stress levels.

Add the concept of stress appraisal.

Intervention to manage the stress is not clear in the model. Add the intervention concept.

The model shall have the following steps: Step 1.

Evaluate the stress.

Step 2. Appraisal: primary and secondary appraisal

Step 3. Coping: apply positive ways and discourage negative ways

Step 4. Reinforcement and re-evaluation for maintaining the positive behaviours.

Add bi - directional arrows (going and coming back) between Step 1 and Step 2

Add bi - directional arrows (going and coming back) between Step 2 and Step 3

Testing the adapted Stress Management Model for nursing students in

Rwanda

The self-management model for nursing students in Rwanda was tested among 39 nursing students of UR- Huye Campus (representing 10% of participants in the main study).



4.4.2 Criteria of selection of students to participate in testing of self-management model.

The model testing concerned only nursing students with low and moderate levels of stress, as when someone is highly stressed, she / he cannot do self-management. Thus, the model was tested with those with low or moderate levels of stress.

Table 4. 5: Implementation plan of Stress Management Model for nursing students in Rwanda

Time	Activities to be performed
Day 1	- Explanation of how to use the stress management model. Step 1. Evaluation of stress level (using the Perceived Stress Scale)
Till Day 7 (1 week)	Step 2. Appraisal Primary Appraisal: identifying the harm / health problems caused by the stress. Secondary appraisal: identifying the available resources / what is done to cope with the stress
Till Day 28 (3 weeks)	Step 3. Coping Applying the positive coping mechanisms to cope with stress - Discouraging the negative coping mechanisms. Step 4. Reinforcement -Encouraging and repeating the positive coping mechanisms
	-Reducing progressively negative coping mechanisms
Day 30	Re-evaluate the stress level Maintain the positive coping mechanism (s) and make it (them) habits

4.5 Feedback from students who participated in testing the stress management model for nursing students in Rwanda.

Nursing students who participated in the model testing showed a high level of enthusiasm about the model of stress management. The appreciation of nursing students who participated in present study is summarized in the following quotations.

“Nursing students in Rwanda... we are very lucky to have our seniors who

think about us and who keep our nursing profession in their heart. The available stress management is very simple to understand, and very easy to use in our day-to-day life”.

Another nursing student who participated in the present study said:

“Having participated in this study is very important for me: I learned so many things from this model: I know the positive measures to reinforce and negative one to discourage. The model has changed my practice in general, and absolutely, I will share the gained knowledge and skills with my friends and my family members
. Finally, as nursing student, my future clients will benefit from services of good quality provided by a professional who know to manage stress effectively”.

4.6 The uniqueness of the study

The uniqueness of the study is in implementation of adapted model of stress management for students studying in selected schools of Nursing in Rwanda. The difference is at implementation level, where in adapted model, nursing students are advised to put more emphasize on reinforcement by:

Encouraging and repeating positive coping mechanisms: time management, physical activities / sports, playing with children, relax to one’ s preferences, promote teamwork spirit, increase the intake of fruits and vegetables, share emotions with beloved, have a good cry if stressed, get time to laugh with others, think positively (be optimist), pray according to one’ s faith.

Discouraging the negative coping mechanisms: taking valium or other drugs, drinking lots of alcohol, drinking lots of coffee, smoking tobacco, acting aggressively, avoidance, overeating, and social isolation. In addition, on regular basis, each nursing student should have a time for self- evaluation to verify if there is effectiveness of

reinforcing the positive strategies and then maintain positive behaviours.

4.7 Discussion of results

This chapter deals with the findings of the study based on the interpretation from the statistical analysis. The findings are discussed in relation to the objectives of the study and are supported by the review of literature. The purpose of the study is to assess stress, stressors and coping mechanisms among nursing students attending some selected nursing schools in Rwanda and adapt a stress management model for nursing students.

4.8 Assessment of stress level, stressors and coping mechanisms of nursing students and exploration of their knowledge about stress management measures and complications

In this study, the level of stress among nursing students were assessed using overall score assessment with help of 15 parameters of PSS. The possible smallest score was 1 coded as rare, the intermediate score was 3 coded as sometimes and the maximum was 5 coded as often. After aggregating and converting into percentage, respondents were categorized as low (34 or lower), moderate (35-42), high (43-50), and very high (51 or higher). Only 63.2% of respondents scored a low level of stress, while 23.9% of participants scored moderate level of stress, and (12.7%) scored a high to very high levels of stress. This indicate that nursing students experience stress while at schools. The results of our studies are in line with the results obtained in several studies and systematic reviews which have assessed stress levels, stressors, and coping strategies among nursing and medical students as follows. Seven systematic reviews and 42 primary studies with data from Bahrain, Egypt, Iraq, Jordan, Oman, Pakistan, Palestine, Saudi Arabia, and Sudan were analysed. Most studies included nursing students undergoing clinical training. They found that only 65% of respondents scored a low level of stress (Chaabane, et al. 2021).

Our results are lower, compared to the results of a study conducted among students of Ribeiro Preto College of Nursing, of the University of Sao Paulo. The students' responses to the Perceived Stress Scale showed that 73.9% presented a medium level of stress, only 9.1% of the students were in a comfortable situation, that is, with low stress levels (Moreira & Furegato, 2013). In the context of our study, coping mechanisms refer to all strategies, behavioural and psychological efforts undertaken by students enrolled in nursing program to manage stress. In this regard, positive coping mechanisms refer to meditation, doing muscle relaxation (sports), listening to music, watching television or movies, reading books, attending health club, socializing with friends. Negative coping mechanisms refer acting aggressively, alcohol abuse, tobacco smoking, taking valium or other drugs that keep individuals from directly addressing stressful events in a proper way. Therefore, the coping mechanisms were assessed using 10 parameters of Coping Behaviour Inventory. The possible smallest score was 1 coded as never, score 3 for sometimes, and score 5 for often. After aggregating and converting them into percentages, it was found that 44% of respondents do not always use the positive coping mechanisms, but use them sometimes, compared to 25% who uses them often, and 30.9% who never use positive coping mechanisms. In addition, 19% of respondents use often negative reactions or actions once exposed to a stress level. This indicates the low level of using positive coping mechanisms by nursing students while exposed to stressful factors.

The above-mentioned results are comparable to others found in a study conducted among nursing students in the Middle East and North Africa region. It aimed to identify the prevalence data on. Various stress levels, find out stressors among nursing students, describe stress coping mechanisms adopted by nursing students in the region, and formulate the recommendations for stress management. In that study, a total of 23

primary studies reported data on stress coping strategies used by nursing students in Saudi Arabia, Egypt, Jordan, Oman, Pakistan, and Sudan. The students adopt both positive and negative coping strategies: the most positive stress coping strategies are problem understanding and solving, seeking social support (e.g., asking others for help and developing social support), become involved in other activities, staying optimistic and finding comfort in religion or spiritual beliefs. In other hand, the most negative strategies are transference, avoidance, and social isolation (Chaabane, et al. 2021).

The above results are also supported by our qualitative results, in which the first theme was the measures of stress management known by nursing students. Emerging responses are sports (presented by all members during the FGD as one of measures contributing to manage stress among students in nursing schools). Social isolation was emerged among others as a solution to adopt as a responsive measure once someone faces stress. Majority of respondents in FGD has quoted avoidance as one of the measures of stress management among students in nursing schools. Students believe that forgetting the situation may help though require more energy and not merely bring success. Meditation and listening to music, were also quoted as a way of reducing stressful situation for students in nursing schools. Adoption of both positive and negative coping mechanisms by nursing students are confirmed by their quotations (typically presented in our results), as attitudes are always dependent to the knowledge. In relation to the stressors, during our study, nursing students were given a list of 12 potential items; each respondent was asked to list and rank the top 5 stressors. For this study, 22% of respondents ranked exams as the first stressor, followed by financial issues 21%, academic workload 18%, illness 15%, and family problems 13%, as the fifth stressor.

In line with our results, the researchers have identified different academic sources of stress including examination, long hours of study assignments, grade, lack of free time,

lack of timely feedback after their performance, special elements of the academic program like clinical placements, attending and conducting workshops (Reddy, Menon & Thattil, 2018). Another study was done on interventional strategies to decrease nursing student anxiety in the clinical learning environment. The clinical sources of stress were fear of making clinical error, caring for clients in critical conditions, conflicts with peer group, heavy clinical requirements, prolonged periods in standing positions (Devkota & Shrestha, 2018).

Stress does not affect nursing students only. A study was done to assess depression and stress amongst undergraduate medical students. End cycle exam was reported as first stressor experienced by final year students (Ludwig et al., 2015). In addition, one study was done among students at a medical school to relate depression to the stress caused by demands during academic life and clinical placements. Among the causes, they reported high volume academic workload, the lack of time for leisure and social events, and the clinical duty exposing them to the situations requiring emotional and critical thinking skills like the severe illnesses and death of clients (Moreira & Furegato, 2013). The below quotation is from one of our KIIs, when asked about the causes of stress among nursing students.

“Internationally, nursing courses are organized in special manner. Theory classes, skills labs sessions followed by OSCE and clinical placements at different levels of health care settings followed also by practical exams make nursing academic workload very heavy than other courses. That structure of nursing program requests nursing schools to cover long period (academic year) than other schools; and nursing students are often requested to work even extra hours, nights, and weekends. More stress is exhibited in preparing and during NCNM

licensing exams. That nature and organization of nursing courses cause to much stress to nursing students”.

As part of our study, assessment of the association of stress level with potential stressors was done. Age group ($p=0.025$), gender ($p=0.003$), school ($p=0.010$), and family problems ($p<0.001$) showed a statistically significant association with the stress level. Students in the age group below 25 years old showed more stress level, ranging from moderate to high levels 23.87% and 11.52% respectively.

Contrary to the above results, some researchers revealed increased levels of stress as the students do progress in their nursing educational program (Naqvi et al, 2018); while other studies concluded no statistical significance between the stress level and students' educational levels (Pulido-Martos et al., 2012). In a study conducted among students of Ribeiro Preto College of Nursing, of the University of Sao Paulo, the results revealed a statistical significance between level of stress and educational level of students. The students in last year of nursing training exhibited increased levels of stress compared to the junior students. The researchers added that the transitional process from the academic atmosphere to professional life requires important personal decisions, such as searching job, getting married, and taking on financial responsibilities, this may be stressful to the final year students. (Moreira & Furegato, 2013).

New students face enormous challenges, including the fear of taking decision in clinical setting during their internships than the older ones. They also face financial constraints, limiting their ability to effectively afford transportation, accommodations, and other basic needs, to advance their academic performance (María, D.O. et al., 2020). Students in higher academic levels, may be required to gain more practical experiences that are needed yet to be nurse professionals. These students feel the need to start new responsibilities, but it is obvious to realise that this can generate some level of stress

too. However, this may justify the fact that students in more advanced academic levels may feel more stressed than those in lower levels. Coupled with the above, there is also a need to reflect on multitude of uncertainties and doubts that may arise when students in nursing schools think on labour market in nursing profession. These students undergo a tough process or certification, licensing, and approvals, which may affect or delay the realization of their expectations as prospective health professionals (Reddy, K.J.; Menon, K.R. & Thattil, A., 2018).

Our results show that female students exhibit higher levels of stress compared to their counterparts. More than 17% demonstrated high to very high level of stress combined (17.49%, n= 39). Our results are supported by other research works which found that for the females, the career (academic and or professional) stress is exacerbated by personal, biological, hormonal, sexual and social demands (27, 28, 29) (Santos & Radunz, 2011); (Furegato, Santos& Silva, 2010); (Fanco et al., 2012). Worldwide, the health consequences of stress are equally distributed among women and men. Despite, some particularities may exist, as a matter of gender. Therefore, women will be more prone to the consequences than men, because women are believed to experience more stress than men, and all have different way of coping on stress. For instance, headaches and migraines are more common among women than men because women muscles tend to tense up more quickly among women than men, thus leading to tension type headaches. In relation to depression and anxiety, the recent evidence proved that women are as twice as more likely as men to experience the effects of depression globally (MedlinePlus, 2022). The existing research suggests that women are more prone to have anxiety disorders including PTSD, panic, obsessive compulsive disorders, and are more likely to acquire and demonstrate the signs of stress than their counterparts, men which can increase the risk of depression and anxiety in general.

Taking into account the heart problems, it has been observed that high level of stress that persist over time contribute enormously to the likelihood of higher blood pressure, and in turn may translate into serious health conditions such as stroke and heart attacks. Similarly, women who are young, and who have experienced the history of heart problems may suffer increased negative effects of stress on heart health. As documented widely, long or short-term stress level can negatively affect the function of the stomach, thus yielding in diarrhea, vomiting and constipation. However, longer stressing level may be more serious and lead to irritable bowel syndrome (IBS), a condition more pronounced in men than women, and characterized by gas and bloating worse (Harvard University, 2015). The World Health Organization has established that the link between stress and increased weight is strongly pronounced among women that it is among men. This is mainly due to hormonal factor, cortisol present in high level among women, and influence the overeating habit, thus causing the body of women to store more fat than men do (WHO, 2021). Problems of getting pregnant can be also the consequences of stress among women. Women who are under greater stress than those who are under less stress are more likely to experience difficulties getting pregnant. Stress might also result from not being able to conceive when you want to. Women who experience chronic or long-term stress may have more severe premenstrual syndrome (PMS) symptoms or irregular periods. Some studies link past abuse or trauma to more severe PMS. Women with long-term stress may take longer to get aroused and may have less sex drive than women with lower levels of stress. While not surprising, at least one study found that women with higher stress levels were more distracted during sex than other women (National Institute of Mental Health, 2022).

In our days, colleges and schools of nursing are now recognized as environment which cause stress that often affect the academic performances and psychological well-being

of students and vice-versa (Chaabane, et al., 2021). Additionally, published studies report that emotional and behavioural problems, among high stress exposure groups, such as in nursing students may affect their lifetime risk of mental health disorders (Furegato, Santos & Silva, 2010); (Fanco, et al., 2012). Another theme of our qualitative results was about the knowledge of nursing students about complications or consequences of high level and prolonged stress. Participants in FGDs testified that higher level of stress is harmful and can lead to depression, once not properly managed. Chronic diseases, sleep disruption, drug abuse and poor social relationship can also be the consequences of prolonged and higher level of stress as quoted by participants in FGDs. The American College Health Association in National Health Assessment (2009, 2010) data revealed over one third (1/3) of all post-secondary education student ranked stress as their highest health obstacle having consequences of sleep issue, depression, and anxiety (Schlarb, Friedrich & Claben, 2017). Published literature has reported that a significant percentage of nursing students leave school before program completion (Smith-Wacholz et al., 2019). University students attending nursing schools find themselves constantly stressed by their academic workload due to clinical placement rotations, night duties and heavy assignment during their academic life. They are therefore exposed to great levels and prolonged stress. As a result, university students attending nursing schools are highly vulnerable to depression, with some research findings showing that up to 38.7% of nursing students are depressed (Tung, et al., 2018). Stress and poor academic performance can become part of a vicious circle (increasing stress leads to decreasing performance, which, in turn, increases stress) during medical education with a potential negative impact on students' and physicians' health and, potentially, the quality of patient care (Voltmer, Kotter & Spahn, 2012).

These findings agree with our qualitative results, in which KIIs when asked about

consequences of stress among nursing students, they responded, “poor performance” and one of them stated is as follows:

“Nursing curriculum is designed in a special manner which causes stress to the students. If X student do not know how to manage stress, absolutely, she / he exhibit poor performance and failure. Thus, there is a need of a special program to assist nursing students coping with stress in their journey towards our noble profession”.

To become professional and competent nurse, requires both practical and theoretical proficiencies in clinical settings. The practice has been proven to advance knowledge and skills among students who study nursing profession, by supporting their ability and efforts to translate theoretical knowledge into practices that aim to improve patient outcomes. There is scientific evidence that supports that to acquire required skills in this profession, problem solving, a sense of professionalism and critical thinking and decision making are required among others (Fernanda, et al, 2020). Yet, negative experiences in this profession can lead to lack of self-esteem and confidence, poor satisfaction, and performance. To build much the practical part, clinical and practical placements are arranged for these students in different clinical settings, including hospitals, clinics, and health centres. Therefore, these students undergone a huge stress in these placements, and may feel more stressed to cope effectively especially on environmental factors, workmate relationships, and work overload. These situations seem to be challenging to these students, and sometimes their capacity or ability to cope are exhausted, leading to chronic stress. However, chronic stress may affect undoubtedly their physical, psychological, emotional, and behavioural life, thus compromising their general wellbeing. This is also considered to be a major risk factor of stress among students studying nursing professions (Baluwa, M.A., 2022).

In 2022, Zheng, et al conducted a study to determine the prevalence of stress among nursing students in their internship. In this meta-analysis, the prevalence of stress among practicing nursing students was estimated to be 61.97% using a random effects model. Thus, the results suggest a high prevalence of psychological stress among practicing nursing students, which is very concerning. The reasons for this may be analysed as follows: first, nursing students enter an unfamiliar clinical environment from the campus, a wide variety of nursing operations, and the gap between the theoretical knowledge learned in school and clinical practice, which can bring some psychological stress to the students. Secondly, nursing students have less social experience and relatively less ability to communicate with people, and poor communication with their supervising teachers, patients, and families as well as complex interpersonal relationships can bring corresponding stress (Zheng, et al. 2022).

Pawan, et al. (2016) did a study in a College of Medicine located in Gujarat in India, and they realized that there are high levels of stress in newly admitted students. As other health related students attending newly established institution, the students who participated in this study confirmed to have experienced academic stressors specifically caused by inadequate facilities. Based on those findings, the investigators recommended that the concerned organs in charge to regulate the health professions should make sure that the minimum required infrastructures are available prior to students' admission (Pawan et al., 2016). Another study done in 2013 by Leodoro assessed student nurses stress and related stressors. The whole population of the university's nursing students was selected to participate in the study. In that research, the participants were requested to provide information related to their stressful situations experienced during their past clinical attachments and college life. The results revealed that nursing students recalled several stressors including heavy academic workload and

among the recommendations formulated by investigators highlight that the stakeholders of nursing education need to be sensitive to students' stressors and find out the ways to improve their coping mechanisms (Leodoro, 2013). In relation to stress and stressors, Edward did a study in 2015 among nursing students in Tamale, Ghana. The study mainly examined the severity of stress and stressors which have been reported more. The study findings indicated that 13% of nursing students were affected by severe stress. Personal issues have been reported by 43 % of participants as stressors followed by academic and finally social matters by 27 % and 9 % respectively. In concluding, the investigators recommended that students' orientation program should include sensitive topics like students counselling and measures to deal with stress (Edward, 2015). In the same line, Chris (2013), carried out research about stress and related coping mechanisms adopted by nursing students. In his study, it has been found that clinical placement experience was reported as the main cause of stress among the studied population at 39 %.

On the other hand, avoidance (which is the negative coping mechanism) and peer support as stress coping mechanisms were the most measures applied by nursing students. Nurse leaders and educators have been recommended to intervene accordingly for improving the teaching and learning process of nurse students (Chris, 2013).

Another study has been done to compare the levels of stress among the students from different professions. It has been found that nurse students experienced higher levels of stress compared to other students enrolled in medical, social work and pharmacy departments. Besides contesting examinations, high workload and other commitments, nurse students identified hospital attachments as their major stressor. Inadequate profession experience, panic related to possibility of making profession errors, complicated clients, anxiety caused by continuous clinical assessments and presentations have been reported as few of the stressors for the nurse students in clinical

areas (Gibbons, 2014; Jimenez, Navia-Osorio & Diaz, 2015).

Respectively, in the year of 2014 and 2017, in School of nursing at the University of Louisville, studies have been conducted with the main aim to identify nurse students' stressors. It has been shown that nursing students find clinical placements more stressful in their educational process than the theoretical component (Sheu, et al., 2014; Katrina & Valerie, 2017). In relation to the culture of competition, Atlantic University conducted research among university students and findings showed that currently the young people live with different levels of psychological stress. One of respondents said "we now live in a time when people are more worried than relaxed. There is never enough time due to tremendous competition in every facet of life. This results in a high level of worry, mental strain, and, of course, displeasure and stress" (Atlantic University, 2022). In other hands, Thomas stated that the psychological stressors from workplaces may also be higher than those from schools or universities. He continued saying that students may attain the highest academic rankings, and that does not give them assurance of getting jobs. Even if they get job, other factors like payment, promotion, getting marriage and others may stress them (Thomas, 2022). MedlinePlus added that sleeplessness due to extreme utilisation of technology materials has negative impact on the overall health of present population and the life in general. The typical example given by MedlinePlus is stated as follows "people's eyesight has deteriorated since they were children due to prolonged exposure of the naked eye to the screens of electronic devices. Overuse of electronics causes anxiety because people forget to look up from their phones and appreciate nature and its wonderful beauty" (MedlinePlus, 2022).

In his research, Thomas found special stressors for university students such as multiple duties, inadequate time management, variations in patterns of eating, drinking, and

sleeping, and lack of time and sometimes means for self-care. More specifically, new students of first year may express psychological stress as they are in transitional period to the academic life and its new contacts and responsibilities. If psychological stress is not well managed, it may have serious physiological complications like lack of concentration in cognitive activities, inadequate social relationship, excessive tiredness, lack of appetite or excessive appetite, a weak immune system, insomnia, and others (Thomas, 2022). Mild stress can stimulate the organism to be in a state of tension and stimulate students to study, while high levels of stress or stress lasting too long can cause an imbalance in the organism and lead to physical and mental illness, affecting nursing students' ability to work in the clinic and even shaking their determination to pursue nursing. If nursing students lack appropriate strategies to cope with stress and the negative effects of their work life, it will not only affect their personal physical and psychological health, but also affect their clinical professional competence, affect the quality of care, and lead to burnout (Baluwa, M.A., 2022).

They reported that internship nursing students' stressors to their knowledge and skills are the main stressors of nursing students' internship. The reason for this is that nursing students end their familiar campus life and step into clinical practice, which brings them different degrees of stress due to the change of identity, learning environment, and employment pressure. Other showed that intern nursing students' professional identity and psychological resilience were influential factors of psychological stress. Stress was negatively correlated with nursing students' professional identity, and the higher the professional identity and the stronger the psychological resilience of intern nursing students, the lower their psychological stress levels (Atlantic University, 2022).

Several studies revealed that nursing students undergone a huge stress in clinical placements, and may feel more stressed to cope effectively especially on environmental

factors, workmate relationships, and work overload. The current studies have identified higher level of stress among students and the biggest contributor to their well-being and health, but also impair their academic performance and ability to deliver much in their nursing profession. However, in the viewpoints of individual perception, stress may vary depending on individual perception on how to cope and manage stressful situations and events. Therefore, in nursing profession, it is of paramount importance to consider the academic context in which these students are, for better addressing their needs (Chaabane, S. et al. 2021). Eventually, students undertaking nursing profession are exposed to a wide range of stressors compared to other students in different disciplines. Coupled with academic stressors, these students face additional stressors such as extreme workload in their training, responsibilities in clinical settings during their placements, and field attachments, tough evaluation combined with accumulation of academic duties among others. In addition, stressing environment may be coupled with the content of the semester in which the student is enrolled. However, the stressing outcome differ to student by student, and may be lesser or higher depending on student cognitive and emotional abilities to manage stress (Baluwa, M.A., 2022).

Different assessments or studies are conducted by depending on the year and the semester in which the students are enrolled. Others may orient their efforts on the program level such as undergraduate or graduate studies in clinical practice. Therefore, the studies have clearly demonstrated that there is a huge difference in terms of stress acquired depending on the above factors. However, this calls a need to continuously advance further researches in terms of what drives these differences (Fernanda, M. S., et al., 2020). Furthermore, the studies in Brazil have demonstrated that there are other factors that were not considered but proved to influence the likelihood of stress. These include marital status, working activity, age of the students, gender, and other socio-

demographic factors. However, this study concluded by suggesting further studies on association between socio-demographic factors and stress level, because their results were inconsistent with other international study results. It is apparent that national surveys on stress level among students in nursing profession are more concentrated in Southern regions of Brazil than other parts of the country. And those focused mainly on factors other than socio-cultural and academic contexts, which highlight the need and importance of extending researches on other fields such as sociodemographic and academic characteristics globally, and in different institutions including where placements are conducted (María, D.O. et al., 2020). The recent study showcased that psychological and physical stimulus that are involved in disrupting homeostasis originates from a stress factor, thus the name of stressor. This stimulus either physical or psychological may initiate changes that are denoted as stress response. However, the stressor response starts by preparing the body to respond to the internal or external challenges, thus presentation of physiological responses. Sometimes, if the exposure lasts too long, or is persistent or recurrent, the response may adapt otherwise, with many negative effects such as depression, anxiety, cognitive impairment, and cardiovascular diseases (Atlantic University, 2022).

The recent studies have shown that professionals in medical fields experience increased levels of stress compared with other professions. In addition, students in nursing and medical practices face higher levels of stress, compared to other disciplines. This is coupled that students in these fields of study face extreme consequences of stress other than groups (Tung, Y.J., et al., 2018). Therefore, it is of paramount importance to start assessing stress level beginning the time when a student starts its internship, to promote his or her physical, mental and emotional health, but also improving his/ her academic performance, and also the quality of its profession in general after graduation and

joining clinical practices in clinical settings (María, D.O. et al.,2020). The subject matter of stress was given consideration overtime in scientific literature and other medical profession documentation as it is nowadays. Most importantly the practical section of the training is believed to bring more stress than others. In this section, lack of practical skills or lower adaptability to skilfully master the technical practices are all perceived as the key stressors in nursing field of education. Other stressors include but not limited to making mistakes in clinical placements, handling emergency cases in emergent situations, and lack of adaptability in specialized clinical units (Fernanda, M. S., et al., 2020). In fact, given that nurse students are normally not considered as same as the registered nurses, may bring some frustrations and stress, thus exposing them to some feeling of lack of confidence, and expose them to some tasks that are not usually done by nurses. Coupled with this, students delay making adaptation specially to build strong work relationships with other health professionals, the rankings observed in hospitals, situations and cultural behavioural of different patients and families (caregivers), complexity of some treatment options may all add up to the existing stressors, thus building more negative effects. Furthermore, nursing students cohabit with other stressors of the kind that are expected given their status as students, such as those connected to their academic program and their status as nursing students. This is because, in contrast to students in other degree programs, nursing students are in touch with the job market, which necessitates a certain level of responsibility in the wellbeing of their patients, distancing them, at times, from campus life and particularly from the typical social activities that their peers take part in (Tung, Y.J., et al., 2018).

Either lower or moderate levels of stress are able to influence student behaviour in terms of motivating positively or negatively the students' performance. Contrarily, higher levels of stress are known to negatively impact the student's academic

performance, thus leading to depression and despair, and therefore affecting students' health and academic level. Although stress might be inevitable among students in nursing discipline, and sometimes difficult to overcome, it is imperative to have adaptable coping mechanism that may help students to improve both their health and academic performances. Consequently, the recent longitudinal studies have demonstrated that stress level may either increase or decrease during academic programs because of behaviour or coping mechanisms that are successful or not (Baluwa, M.A., 2022). As the recommendations in different studies, the analysis of studies on stress level among nursing student may reflect gender, course, and clinical placement, based on the available literature. Therefore, as different countries have different programs that may also differ by country and programs, these variables must be considered with caution. This is because in some studies, the first year was identified as being the most stressing while for others the third or last year was concluded as the most stressful year due to more clinical practices and placements are to be accomplished. Therefore, as much as reacting to stressors may be different among students, it is the same as when it comes to manage stress. However, problem-solving strategy was identified to be the most important and successful strategy that can be used to deal with stress among students. Besides, emotional based coping approaches also appear to be effective too (Zheng, et al. 2022). The existing literature provides that coping mechanisms can be sought as ideas, behaviours and actions undertaken by a person towards adapting his internal and external influences that are believed or perceived as stressful. Studies have demonstrated that these stressful conditions either internal or external affect negatively students' academic performance and their life in general. It is recommended that educational institutions assess all causes and factors that can bring stressing level on high level, and try to minimize, reduce, or avoid them wherever possible.

This can be achieved on one hand by formulating program policies and interventions that aim at supporting students' efforts towards academic performance and improved well-being in general (Baluwa, M.A., 2022).

Moreover, although this field of stress and coping strategies was largely investigated in different countries, little to none was sufficiently studied on this subject matter in sub-Saharan African countries. Existing evidence is documented on the available types of stressors among students enrolled in nursing programs, and the types of adaptability, but countries in this regions did not clearly provide levels of stress by country, or by program or by curriculum to inform academic institutions, policy developers, and implementing institutions on the trends of the threat and recommend on remedial strategies, for the best country outcomes (Fernanda, M. S., et al., 2020). Taking academic program in nursing field can be believed to be with not effects, most importantly negative ones. Students in nursing may feel anxious, stressed, and depressed throughout their academic program in comparison with their counterparts in other education programs. Nursing program embodies enormous challenges and stress, that will negatively impact students' creativity and their ability to improve learning performance, thus causing them mental fatigue, stress, and depression among others. However, the complex curriculum of nursing program coupled with other stressors encountered in daily life may exacerbate the impact of stress on students in nursing programs. Therefore, early identification of sources of stress, can meaningfully bring more impactful change toward overall performance, thus motivating them to acquired required skills needed in the nursing profession (Atlantic University, 2022).

However, the study in Singapore have documented the evidence that students in nursing schools use mostly strategies such as talking their stressing circumstances with their peers as the best useful to prevent or control their level of stress. Conjointly, the

relationship of students, educators and other university staff have also been documented, to influence the level of stress students experience during their academic journey. Therefore, educators and mentors are important to be considered when it comes to elaborate strategies and interventions aiming to prevent, reduce or control stress level among students. They must be included in these approached for the proper implementation of coping strategies (Tung, Y.J., et al., 2018). Another study done in 2013 by Leodoro assessed student nurses stress and related stressors. The whole population of the university's nursing students was selected to participate in the study. In that research, the participants were requested to provide information related to their stressful situations experienced during their past clinical attachments and college life. The results revealed that nursing students recalled several stressors including heavy academic workload and among the recommendations formulated by investigators highlight that the stakeholders of nursing education need to be sensitive to students' stressors and find out the ways to improve their coping mechanisms (Leodoro, 2013).

A study was conducted among nursing students in Tamale, Ghana. It mainly examined the severity of stress and stressors which have been reported more. The study findings indicated that 13% of nursing students were affected by severe stress. Personal issues have been reported by 43 % of participants as stressors followed by academic and finally social matters by 27 % and 9 % respectively. In concluding, the investigators recommended that students' orientation program should include sensitive topics like students counselling and measures to deal with stress (Edward, 2015). Another study was carried out about stress and related coping mechanisms adopted by nursing students. In his study, it has been found that clinical placement experience was reported as the main cause of stress among the studied population at 39 %. On the other hand,

avoidance (which is the negative coping mechanism) and peer support as stress coping mechanisms were the most measures applied by nursing students. Nurse leaders and educators have been recommended to intervene accordingly for improving the teaching and learning process of nurse students (Chris, 2013).

Other researchers compared the levels of stress among the students from different professions. It has been found that nurse students experienced higher levels of stress compared to other students enrolled in medical, social work and pharmacy departments. Besides contesting examinations, high workload and other commitments, nurse students identified hospital attachments as their major stressor. Inadequate profession experience, panic related to possibility of making profession errors, complicated clients, anxiety caused by continuous clinical assessments and presentations have been reported as few of the stressors for the nurse students in clinical areas (Gibbons, 2014; Jimenez, Navia-Osorio & Diaz, 2015).

Respectively, in the year of 2014 and 2017, in School of nursing at the University of Louisville, studies have been conducted with the main aim to identify nurse students' stressors.

It has been shown that nursing students find clinical placements more stressful in their educational process than the theoretical component (Sheu, et al., 2014; Katrina & Valerie, 2017). Coupled with the known stressors, clinical practices intensify the stress level among students in nursing programs. One can understand a student who use to sit in the class for theoretical sessions, how he or she can feel dealing with patients extremely suffering to die, managing extreme emergences, and wounded patients. Together with inadequate skills and knowledge, poor relationships with other clinicians and unfamiliarity with the clinical setting environment may all exaggerate the stress level of these students. Therefore, initial period of clinical placement is observed to be

the most stressing period in nursing placements, although students have reported similar patterns in advanced years (Tung, Y.J., et al. 2018). Yet, students feel more stressed with external factors such as accommodation, financial constraints, as well as classmates' relationships and peer pressures. However, this calls the need to have in place adaptive and coping mechanisms that motivate students to keep being optimistic towards their academic goals and orientations. These strategies are meant to support students alleviate the effects that these stressors may have on their academic performance, but also their well-being in general. Though some studies may have been done in African countries such as the one conducted in Malawi, that identified numerous factors that may lead to stress among students in nursing programs, the aspects of stress, and its level was not fully subjected to investigation. Therefore, there is a strong need to design academic programs that fully support to address students' needs in terms of preventing, controlling and alleviating stressors that students in nursing programs may encounter (Reddy, K.J.; Menon, K.R. & Thattil, A.,2018).

Though some factors such as financial issues and level of study are known to influence stress, there is a need to adequately provide the extent to which these factors contribute to the stress levels among students in nursing programs. Therefore, it is worth to note that knowledge and skills of students with regards to stress management is important in terms of preventing students to face stress by managing stressors adequately (Zheng, et al., 2022). Compared with other countries especially globally, African countries report a considerable number of students who experience elevated levels of stress. This may be dictated by different contextual factors that are solely encountered in Africa, such as poverty. As for instance, 50% of African countries are categorized below poverty line, and 25% live in extreme poverty, and these situations alone may increase the level of stresses African population including students.

Similarly, this pattern is coupled with the insufficient resources in many educational institutions and clinical settings in Africa (Baluwa, M.A., 2022). Again, studies have reported insufficient number of human resources, and inadequate knowledge among available staff, to effectively support students in their clinical practice engagements. This implies higher burden of fear to these students, of acquiring or contracting some of hospital acquired infections such as HIV, tuberculosis, and others (Fernanda, M.S., et al., 2020). The results obtained through different studies suggest that attention should be focused on the stress level of intern nursing students and bring it down to an appropriate level. Nursing students face multiple psychological stressors during their internship, and studies shown that among the stressors of internship nursing students, employment stress is the first stressor of nursing students during their internship. It is said that this may be related to the fact that the number of nursing students graduating has been increasing year by year in recent years, while the number of jobs offered by major hospitals is becoming less and less, the employment situation is becoming increasingly severe, and the gap between nursing students' career expectations and employment reality causes them greater stress (Fernanda, M. S., et al., 2020).

Globally, the immense literature in medical research have documented that the level of stress for students in nursing schools vary depending on different factors. This supports the existing need to implement a wide range of interventions that target to improve the level of stress among these students, for not only their academic performance but also their well-being and health in general.

Similarly, studies have documented the evidence that the stress level may increase as a factor of level of education. As for this, it was observed that from the 6th to the 10th semester, students in nursing schools gradually experience the increasing level of stress compared to other professions, this however, reduces their ability to communicate, and

interact with the external environment, or other professionals (Joyce University of Nursing and Health Sciences, 2022). The above evidence is supported by the fact that, these students face many challenges, that are coupled with both theoretical and practical clinical workload compared with students in other semesters, especially lower semesters. In addition, these works are of paramount importance, since they make students mature in the field of nursing practice, improve their abilities to articulated effective communication with others in the same professions (healthcare providers) (Fernanda, M. S., et al., 2020).

Additionally, students in higher academic levels, may be required to gain more practical experiences that are needed as yet to be nurse professionals. These students feel the need to start new responsibilities, but it is obvious to realise that this can generate some level of stress too. However, this may justify the fact that students in more advanced academic levels may feel more stressed than those in lower levels. Coupled with the above, there is also a need to reflect on multitude of uncertainties and doubts that may arise when students in nursing schools think on labour market in nursing profession. These students undergo a tough process or certification, licensing, and approvals, which may affect or delay the realization of their expectations as prospective health professionals (Reddy, K.J.; Menon, K.R. & Thattil, A., 2018).

The types of courses, and programs may also affect the level of stress among students in nursing schools. However, although practical sessions bring more stress, it was reported that theoretical sections of the course need to be considered when it comes to implementing strategies and interventions that aim to prevent or reduce the burden of stress among these students. Especially students in undergraduate, may feel more stressed and concerned to better assimilate the theoretical contents. In addition, they express the fear of failure when it comes the time for assessment (Baluwa, M.A., 2022).

Contrary, other studies have demonstrated that students in lower academic levels and semesters appear to experience higher levels of stress, that are mostly related to both theoretical and practical parts of the courses. This may be explained by the fact that there is a lot of academic works, coupled with that these students are new in the field of nursing, and that are facing new courses in the discipline, and all these may bring more concerns to these students, thus increasing the level of stress.

Therefore, researchers have continued to document the need of improved knowledge on coping mechanisms and strategies. Existing scientific evidence supports the idea that these students use most of the time problem solving, followed by cognitive reconstructive approaches as the most important coping mechanisms (Atlantic University, 2022).

As per the findings of Folkman and Lazarus, problem solving was identified to be the most important and effective strategy to cope with higher levels of stress used by students in nursing schools. However, it was demonstrated that problem solving, cognitive reconstruction and social or psychological support may inversely correlate, which indicate that people who suffer less level of stress, will use more often these strategies compared to those who suffer higher level of stress. In the similar way, positive correlation was documented among those who experience greater level of stress, with traits of anxiety. However, they prefer to use wishful thinking, self-criticism, social withdrawal, and problem avoidance as the best strategies to overcome higher level of stress (Zheng, et al., 2022). In line with the above evidence, the recent research findings have proven that greatest perceived stress was mostly identified amongst those who was having anxiety traits. However, predictors of lower levels of stress among others included problem solving and cognitive reconstructing strategies, while wishful thinking appears to be a predicting factor of higher level of stress (María, D.O. et al., 2020). In

other hand, the study in Singapore have documented the evidence that students in nursing schools use mostly strategies such as talking their stressing circumstances with their peers as the best useful to prevent or control their level of stress. Conjointly, the relationship of students, educators and other university staff have also been documented, to influence the level of stress students experience during their academic journey. Therefore, educators and mentors are important to be considered when it comes to elaborate strategies and interventions aiming to prevent, reduce or control stress level among students. They must be included in these approached for the proper implementation of coping strategies (Tung, Y.J., et al., 2018).

4.9 Adaptation of a stress management model for nursing students studying in some selected nursing schools in Rwanda.

Stress is the physiological reaction of the body to the internal or external pressure leading to the imbalance of psychological status, and it is an event considered as inevitable in the life of all normal human beings (Mohammad, et al., 2020). For effectively managing stress, several researchers and specialists have suggested to cultivate different mechanisms such as time management, physical activities / sports, playing with children, relax to one' s preferences, promote teamwork spirit, increase the intake of fruits and vegetables, share emotions with beloved, have a good cry if stressed, get time to laugh with others, think positively (be optimist), and pray according to one' s faith (Thiel, Connelly & Griffith, 2011); (Isaksson, et al., 2017); (Bakker, Pechenizkiy & Sidorova, 2011); (Glazer & Liu, 2017).

In other hands, always for effective stress management, researchers and specialists have advised to discourage some habits like taking valium or other drugs, drinking lots of alcohol, drinking lots of coffee, smoking tobacco, acting aggressively, avoidance, overeating, and social isolation (Lewis, et al., 2016); (Hu. et al., 2016); (Toulabi,

Hassanabadi & Izanloo, 2017). Stress is an inevitable event commonly associated with college life. It usually occurs from numerous factors such as academic, physical, physiological, psychological, social, and environmental aspects. In different occasions, researchers found that students use positive and negative measures to fight against stress (Yikealo, Yemane & Karvinen, 2018); (Schlarb, Friedrich & Claben, 2017). It is in that line; other studies suggested the well-structured program which may be the personal management techniques or professional assistance to improve stress controlling capability of the students (Shikai, et al., 2010). More specifically for nursing students, the personal program to manage stress, will contribute towards holistic well-being of themselves (Reddy, Menon & Thattil, 2018) and may also support them in the future professional life in helping clients who present problems resulting from stress and depression (Moreira & Furegato, 2013).

In this study, two (2) key informants from each selected institution were interviewed to assess students' stressors and to get information about availability of stress management program to cope with stress of students at school. The following is the quotation of one among the KII.

“Nursing curriculum is designed in a special manner which causes stress to the students. If X student do not know how to manage stress, absolutely, she / he exhibit poor performance and failure. Thus, there is a need of a special program to assist nursing students coping with stress in their journey towards our noble profession”.

Bearing in our mind the above-mentioned results, the third objective of the present study was to adapt a model of stress management for nursing students studying in some selected nursing schools in Rwanda. The model was adapted based on the existing theory stated as “Transactional Model” of Doctor Richard Lazarus and Doctor Suzan

Folkman (1984) and the adapted model has 4 major concepts or steps, namely stress, appraisal, coping and reinforcement. The adapted model for stress management among nursing students studying in some selected nursing schools was validated by a team of experts in nursing profession and then tested among 39 nursing students of UR-Huye Campus (representing 10% of participants in the main study). Nursing students who participated in the model testing showed a high level of enthusiasm about the model of stress management. The appreciation of nursing students who participated in present study is summarized in the following quotations.

“Nursing students in Rwanda... we are very lucky to have our seniors who think about us and who keep our nursing profession in their heart. The available stress management is very simple to understand, and very easy to use in our day-to-day life”.

Another nursing student who participated in the present study said:

“Having participated in this study is very important for me: I learned so many things from this model: I know the positive measures to reinforce and negative one to discourage. The model has changed my practice in general, and absolutely, I will share the gained knowledge and skills with my friends and my family members. Finally, as nursing student, my future clients will benefit from services of good quality provided by a professional who know to manage stress effectively”.

In the same context of our study, other research works were done and found the effectiveness of stress management program among students. Studies were done to understand the causes of stress affecting nursing students and their coping measures. Both studies concluded that the results would enable nursing schools to use evidence-based interventions and supportive programs to minimize the burden of stress among

nursing students (Devkota & Shrestha, 2018). Several research findings related to health professional education, revealed that nursing and medical students are the most affected by stress. In this regard, a study was done and investigated the effectiveness of brief program designed to decrease stress by means of mindfulness-based or guided meditation methods. They concluded that brief, individually focused, mindfulness-based programs were effective in decreasing levels of stress in medical and nursing students (Shikai, et al., 2010); (Witt, et al., 2019).

In the same context, Rudman and Gustavsson conducted a study on the Self-Care Skills to Prevent Burnout in an Undergraduate Nursing Course. They concluded that the Mindfulness education program was effective in reducing the stress level and increased self-care in nursing students who implemented the program (Rudman & Gustavsson, 2012). Another project implemented a stress reducing workshop and an instructional deep breathing compact disk (CD) to determine the effects of this intervention upon the stress levels of nursing students. The results demonstrated that students' stress levels were decreased after the stress reducing interventions (Kristiann, 2014). Iyamuremye and Brysiewicz conducted a study on the development of an intervention model to manage secondary traumatic stress in mental health workers in Rwanda. They found that the developed model to manage secondary traumatic stress played an essential role in providing effective mental health services to traumatized and other psychiatric clients. They concluded that the model developed can serve as effective framework to mental health professionals for improving the quality of services (Iyamuremye & Brysiewicz, 2015).

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter focuses on the summary of the result findings and conclusion which is strictly based on the research findings. In addition, this chapter covers the recommendations formulated at different levels.

5.1 Summary of findings

The main objective of this study is to adapt a model of stress management for students attending some selected nursing schools in Rwanda, and the study findings revealed that the study objectives were attained.

5.1.1 Assessment of the level of stress, stressors and coping mechanisms of nursing students studying in some selected schools of nursing in Rwanda.

Results indicate that nursing students experience stress while at schools: only 63.2% of respondents scored a low level of stress while, 23.9% of participants scored moderate level of stress, and 12.7% scored a high to very high levels of stress. About coping mechanisms, 44% of respondents do not always use the positive coping mechanisms, but use them sometimes, compared to 25% who uses them often, and 30.9% who never use positive coping mechanisms. In relation to stressors, 22% of respondents ranked exams as the first stressor, followed by financial issues (21%), and academic workload (18%).

5.1.2 Exploring the knowledge of nursing students studying in some selected nursing schools in Rwanda about stress management measures and complications of stress.

The first theme of our qualitative results was the measures of stress management known by study participants. Emerging responses are sports (presented by all members during the FGD as one of measures contributing to manage stress among students in nursing

schools). Social isolation was emerged among others as a solution to adopt as a responsive measure once someone faces stress. Majority of respondents in FGD has quoted avoidance as one of the measures of stress management among students in nursing schools. Study participants believe that forgetting the situation may help though require more energy and not merely bring success. Meditation and listening to music, were also quoted as a way of reducing stressful situation for students in nursing schools. Adoption of both positive and negative coping mechanisms by nursing students are confirmed by their quotations (typically presented in our results), as attitudes are always dependent to the knowledge. The above-mentioned data are supported by the qualitative data from KIIs.

5.1.3 Adaptation of a stress management model for nursing students studying in some selected nursing schools in Rwanda.

The Stress Management Model for nursing students in Rwanda was adapted based on the existing theory stated as” Transactional Model” of Doctor Richard Lazarus and Doctor Suzan Folkman, and it has 4 major concepts namely stress, appraisal, coping and reinforcement. The adapted model for stress management among nursing students studying in some selected nursing schools was validated by a team of experts in nursing profession and then tested among 39 nursing students of UR- Huye Campus (representing 10% of participants in the main study). Nursing students who participated in the model testing showed a high level of enthusiasm about the model of stress management and the appreciation of nursing students who participated in present study is summarized in their quotations.

5.2 Conclusion

The purpose of the study is to assess stress, stressors and coping mechanisms among nursing students attending some selected nursing schools in Rwanda and adapt a stress management model for nursing students. The results revealed that nursing students experience stress while at schools, and they use both positive and negative coping

mechanisms if stressed. Adoption of both positive and negative coping mechanisms by nursing students are confirmed by their quotations (typically presented in our results), as attitudes are always dependent to the knowledge. The stress management model for nursing students in Rwanda was successfully adapted, validated, and it has 4 concepts namely stress, appraisal, coping and reinforcement. It emphasizes on the reinforcement of positive coping mechanisms and discourages the negative ones for promoting the capability of human body to cope effectively with the daily life stressors and thus improve the academic and overall health of nursing students in Rwanda and beyond. The appreciation of nursing students who participated in present study is summarized in their quotations.

5.3 Recommendations

Based on the findings of the study, the following recommendations are formulated:

- **To nursing students from University of Rwanda, Mount Kenya University Rwanda, Ruli Higher Institute of Health:** It is suggested to adapt the stress management model in daily life by reinforcing the positive coping mechanisms and discouraging the negative ones for promoting the capability of body to cope effectively with the daily life stressors and thus improve the academic and overall health.
- **Schools of nursing in University of Rwanda, Mount Kenya University Rwanda, Ruli Higher Institute of Health:** It is recommended to promote the use the of available model to prevent and manage stress among nursing students.
- **Ministry of education in Rwanda:** It recommended to use the results of this study and develop policies related to stress management among nursing students in Rwanda.
- **Other researchers** are suggested to:

Use the results of this study as a point of reference when involved in research

related to stress management.

Carry out a comparative study between nursing students and students from other departments.



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APPENDICES

Appendix I: Consent form to participate in the study. To: The respondent of research,

Dear Participant,

Re: Request of the participation in the research's data collection process

I, Christine Nyirahabimana, a student at Mount Kenya University (MKU) / Thika – Nairobi Campus, pursuing a PhD program in Nursing, I am conducting research on the adaptation of stress management model for nurse students studying in schools of nursing of Rwanda. The information given during this research is for academic purpose only and the principle of confidentiality will be extremely respected. I would be very grateful if you would support my study by responding to the questionnaire. Your participation will be highly appreciated, and the questionnaires will take about 30 minutes. No known risks, nor immediate benefits for your participation. You are free to participate or withdraw from the research at any time. If you agree, kindly sign this consent form.

Thank you.

Signature of participant

Date.

Researcher's signature

Date.....

Christine Nyirahabimana (PhD Candidate)

Email: krina2020@yahoo.fr / nkrina2020@gmail.com

Tel: +250788 650 325

Appendix II: Questionnaire Instructions

- Kindly respond respecting the specific instructions to closed questions.
- Summarize your opinion on the open question.
- Don't write your name on the questionnaire.

Questionnaire to assess level of stress among students. Students' identification

Code Number:

Age in years:

Gender: Male

Female

Marital status: Married

Single Divorced Separated Widowed

School: - UR Campus: Rwanjagana

Huye

MKUR

RHIH

Nursing program: Advanced diploma

Bachelor

Educational level: Year 1

Year 2 Year 3 Year 4 Upgrading

Employed: Yes

No

If yes, working place (Institution).....

Evaluation of stress level

Instruction: Encircle the options matching with you:

During last month, how frequently do you:	Rarely: Almost never	Sometimes: Once or twice each week	Often: Four
Experience headaches?	1	3	5
Find it not easy to focus on work due to closing date or other	1	3	5

responsibilities?			
Eat, drink, or smoke for reducing anxiety or pressure?	1	3	5
Worry about your responsibilities at night and/or on weekends?	1	3	5
Lose sleep in the night thinking about things to do the next day?	1	3	5
Become disturbed due to things that have not been done correctly?	1	3	5
Tend to get irritable?	1	3	5
Lose sleep in the night and have difficulties in getting back to sleep?	1	3	5
Interrupt people while they are talking?	1	3	5
Forget about appointments or forget where you have placed some objects?	1	3	5
Get diarrhoea or constipation?	1	3	5
Feel very tired?	1	3	5
Get appetite changes?	1	3	5
Feel anxious?	1	3	5
Feel disorganized?	1	3	5
Totals	= ...	= ...	= ...
Grand total	=		

Other instructions:

Add the numbers from 15 items you circled.

Enter your score here: _____

Evaluate your score according to the following criteria:

Potential level of stress

- **Low** :34 or lower
- **Moderate** :35-42
- **High** :43-50
- **Very high** :51 or higher

Source: (McGraw-Hill Higher Education, 2011)

Questionnaire to identify possible stressors among students

List the 5 most stressors to you, by indicating into (...) the number according to how much, the stressor accounts for you: N⁰1, N⁰2, N⁰3, N⁰4 and N⁰5.

Separation from family (...)

Academic workload (...)

Exams (...)

Roommates (...)

Financial issues (...)

Family problems (...)

Illness (...)

Peer pressure (...)

Competition (...)

Choosing career (...)

Future profession (...)

Any other? Specify:



Questionnaire to identify students' coping mechanisms.

Instructions:

Listed below are some positive ways of reacting to stress.

Check the following items and put **your** appropriate number accordingly: Never (1), Sometimes (3) and Often (5)

Response	Never	Sometimes	Often
Meditation	_____	_____	_____
Doing muscle relaxation	_____	_____	_____
Listening to music	_____	_____	_____
Watching television or movies	_____	_____	_____
Reading books	_____	_____	_____
Attending health club	_____	_____	_____
Relax	_____	_____	_____
Participating in recreational activity	_____	_____	_____
Socializing with friends	_____	_____	_____
Sitting outside	_____	_____	_____
_____	_____	_____	_____
Totals	= ...	= ...	
Grand Total:	= ...	= ...	

Listed below are some negative ways of reacting to stress.

<i>Response</i>	<i>Never</i>	<i>Sometimes</i>	<i>Often</i>
Acting aggressively	_____	_____	_____
Shouting at somebody	_____	_____	_____
Overeating	_____	_____	_____
Lack of appetite for long time	_____	_____	_____
Drinking lots of alcohol	_____	_____	_____
Drinking lots of coffee	_____	_____	_____
Smoking tobacco	_____	_____	_____
Spending time alone	_____	_____	_____
Biting fingernails	_____	_____	_____
Taking Valium or other drugs	_____	_____	_____
_____	_____	_____	_____
Totals	= ...	= ...	= ... Grand Total: ...

If grand total of negatives is greater than grand total of positives, you need to pay attention about your stress level and you are advised to try positive responses for reducing your level of stress.

160

Focus group discussion guide to assess students' knowledge regarding stress.

What are the measures do you know for stress management?

What are positive effects of low level of stress in our life?

What are the complications of high level and prolonged stress you know?

Appendix III: Interview guide for Key Informants

Institution:

Position: Dean / Head of Department

Length of service on that positionyears

Questions

From your observations, what are the likely causes of stress among nurse students?

Is there any supportive mechanism put in place in your institution to support students coping with stress?

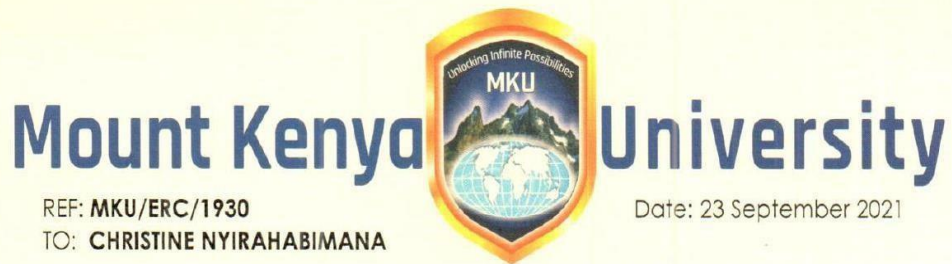
From your observations, what are the likely consequences of stress among the nurse students?

Thanks a lot for your time and collaboration!!!!



Mount Kenya University

Appendix IV: ERC Letter



REF: MKU/ERC/1930
TO: CHRISTINE NYIRAHABIMANA

Date: 23 September 2021

REG: PhDNS/47028/2016

Dear Sir/Madam,

RE: DEVELOPMENT OF STRESS MANAGEMENT MODEL FOR STUDENTS STUDYING IN SELECTED SCHOOLS OF NURSING IN RWANDA

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **1003**. The approval period is **23/09/2021 - 22/09/2022**.

This approval is subject to compliance with the following requirements;

- i. Only approved documents including informed consents, study instruments, MTA will be used
- ii. All changes including amendments, deviations and violations are submitted for review and approval by **Mount Kenya University**
- iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to **Mount Kenya University** within 72 hours of notification
- iv. Any changes, anticipated or otherwise that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to **Mount Kenya University** within 72 hours
- v. Clearance for export of biological specimens must be obtained from relevant institutions
- vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal
- vii. Submission of an executive summary report within 90 days upon completion of the study to **Mount Kenya University**

Prior to commencing your study, you will be expected to comply with any additional requirements from the relevant authorities in the country where this study will be conducted

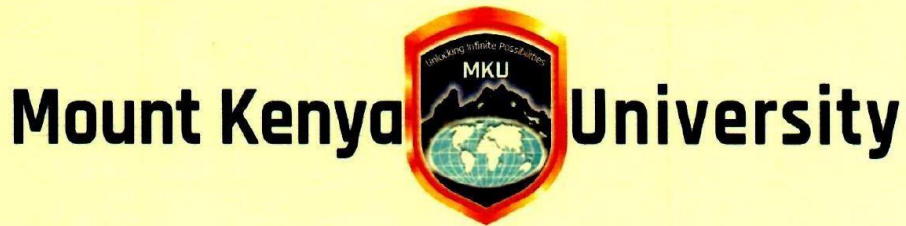
Yours sincerely,



Dr. Peter G. Kirira
Chairman, Mount Kenya University IERC

The Chairman
Mount Kenya University
Ethics Review Committee
P. O. Box 342 - 0100, Thika

Appendix V: Introductory Letter



DIRECTORATE OF GRADUATE STUDIES

PHDNS/47028/2016

2nd November, 2021

To Whom It May Concern

Dear Sir/Madam,

RE: CHRISTINE NYIRAHABIMANA - REGISTRATION NO. PHDNS/47028/2016


The purpose of this letter is to introduce the above named student who is pursuing Doctor of Philosophy in Nursing in the Department of Nursing in the School of Nursing.

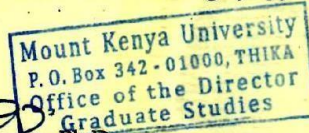
The title of her research is *"Development of Stress Management Model for Students Studying in Selected Schools of Nursing in Rwanda."*

She has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data for her research between November and April, 2022.

Any assistance accorded to her will be highly appreciated.

Thank you.


Dr. Samuel M. Karenga, Ph.D
Director, Graduate Studies
Enc.



Main Campus, General Kago Road, P.O. Box 342-01000 Thika. Tel: +254 67 2820 000,

Cell: +254 720 790 796, 0709 153 000

Email: info@mku.ac.ke, Web: www.mku.ac.ke

Chartered and ISO 9001 : 2015 Certified Institution.

Unlocking Infinite Possibilities

Appendix VI: Letter requesting for Research affiliation at UR

Christine Nyirahabimana

Muhanga, December 1st, 2021.

PhD Candidate at Mount Kenya University / Nairobi Campus

Email: nkrina2020@gmail.com / krina2020@yahoo.fr

Tel: +250788 650 325

To: The College Director of Research and Postgraduate Studies at UR

Dear Sir,

RE: REQUEST FOR RESEARCH AFFILIATION.

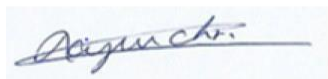
I am Christine Nyirahabimana, a student at Mount Kenya University (MKU) Thika – Nairobi Campus, pursuing a PhD program in the Department of Nursing. I am conducting research on “The development of stress management model among students’ nurses studying in selected schools of nursing in Rwanda. This research is conducted under the guidance of Doctor Connie Mureithi, Doctor Rosemary Okova, both from Mount Kenya University, Rwanda, and my Internal Supervisor Assoc. Prof Madeleine MUKESHIMANA from UR.

Mount Kenya University has reviewed and approved my research proposal including all research instruments of data collection (Introduction Letter from University and Certificate of University Ethics Review Committee attached).

Quantitative and qualitative approaches will be used. Data will be collected from undergraduate nursing students studying in selected schools of Nursing in Rwanda including UR.

Dear Sir, it is in that background, I am writing this letter to request for research affiliation for the above-mentioned study. Information given during this research will be for academic purpose only.

Thanking you so much,



Christine Nyirahabimana

PhD Student at Mount Kenya University.

CC:

- Internal Supervisor Assoc. Prof Madeleine MUKESHIMANA

Appendix VII: Affiliation with UR – Research



UNIVERSITY of
RWANDA

COLLEGE OF MEDICINE & HEALTH SCIENCES

OFFICE OF THE PRINCIPAL

Kigali, ... 21 / ... 01 / ... / 2022
Ref.No: 022 / UR-CMHS/2022

NYIRAHABIMANA Christine
Student Number: Ph.D. NS/47028/2016
Mount Kenya University/ Nairobi Campus
Email: nkrina2020@gmail.com | krina2020@yahoo.fr
Phone: +250788650325 / 735037473

Dear Christine,

Re: Affiliation with University of Rwanda, College of Medicine and Health Sciences

Reference is made to your request dated 01 December 2021 requesting for affiliation with the University of Rwanda College of Medicine and Health Sciences (UR-CMHS) under the research topic detailed below;

Research Topic	The development of stress management model among students' nurses studying in selected schools of nursing in Rwanda.
Research Team	<ol style="list-style-type: none">1. Christine Nyirahabimana, PhD Candidate and <i>Principal Investigator</i>, Mount Kenya University, Nairobi Campus;2. Associate Professor Madeleine MUKESHIMANA, PhD, <i>UR Supervisor</i>, School of Nursing and Midwifery, College of Medicine and Health Sciences (CMHS), University of Rwanda, Rwanda; Mobile: +250785256459; Email: angemado20@gmail.com;3. Dr Connie Mureithi, PhD, Research Supervisor, Nursing, Mount Kenya University Rwanda (MKUR), Rwanda;4. Dr Rosemary Okova, PhD, Research Supervisor, Nursing, Mount Kenya University Rwanda (MKUR), Rwanda.

Email: principal.cmhs@ur.ac.rw

P.O Box 3286 Kigali,

Rwandawww.ur.ac.rw

4



Research Objectives	<ol style="list-style-type: none">1. To establish knowledge level regarding stress among nurse students studying in some selected nursing schools in Rwanda.2. To assess the level of stress, stressors and coping mechanisms of nurse students studying in some selected schools of nursing in Rwanda.3. To develop a model of stress management for nurse students studying in some selected nursing schools in Rwanda.
Purpose of Research:	This study aims to develop a model of stress management for students attending some selected nursing schools in Rwanda.
Data Collection Location:	Selected Rwandan public and private nursing schools: University of Rwanda, Mount Kenya University Rwanda, and Ruli Higher Institute of Health.
Dates Research will commence	January 2022
Estimated Period of Research	One year.
Data Collection Target Group	<ul style="list-style-type: none">- Undergraduate nursing students studying in selected public and private institutions;- Deans and Heads of Departments of the selected nursing schools.

I am pleased to inform you that your application for affiliation is approved. You are advised to obtain the necessary approvals before proceeding with the research project as well as work with the University of Rwanda College of Medicine and Health Sciences Directorate of Research and Innovation for more assistance.

I wish you success in your research.

Sincerely,

Assoc. Prof. Jeanne Kagwiza
Ag. Principal, College of Medicine and Health Sciences, University of Rwanda

Appendix VIII: Request for UR / CMHS - IRB Ethical Clearance

Christine Nyirahabimana

Muhanga, April 26th, 2022.

PhD Candidate at Mount Kenya University / Nairobi Campus

Email: nkrina2020@gmail.com / krina2020@yahoo.fr

Tel: +250788 650 325

To: The Chairperson of CMHS - IRB

Dear Professor,

RE: Request for CMHS - IRB Ethical Clearance

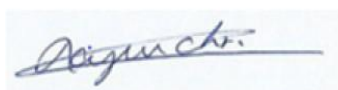
I am Christine Nyirahabimana, a student at Mount Kenya University (MKU) Thika – Nairobi Campus, pursuing a PhD program in the Department of Nursing. I am conducting research on “The development of stress management model among students’ nurses studying in selected schools of nursing in Rwanda. This research is conducted under the guidance of Doctor Connie Mureithi and Doctor Rosemary Okova, both from Mount Kenya University, Rwanda; and my Internal Supervisor Assoc. Prof Madeleine MUKESHIMANA, School of Nursing and Midwifery at CMHS / UR.

Mount Kenya University has reviewed and approved my research proposal including all research instruments of data collection (Introduction Letter from University and Certificate of University Ethics Review Committee attached); and I am affiliated with UR, CMHC (affiliation attached).

In the above-mentioned research, Quantitative and qualitative approaches will be used. Data will be collected from undergraduate nursing students studying in selected schools of Nursing in Rwanda. Also, two (2) key informants (Dean and Head of Department) from each institution will be contacted for interview. In the case of UR, a total sample of 179 nursing students will be selected to participate in the main study: 61 and 118 from Huye and Rwamagana campuses respectively.

Dear Professor, I am writing this letter to seek for CMHS - IRB Ethical Clearance so that I can proceed with the data collection. Information given during this research will be for academic purpose only. All required documents are attached to this letter.

Thanking you so much,



Christine Nyirahabimana

PhD Student at Mount Kenya University.

Appendix IX: UR - IRB ethical Clearance



UNIVERSITY of
RWANDA

COLLEGE OF MEDICINE AND HEALTH SCIENCES

DIRECTORATE OF RESEARCH & INNOVATION

CMHS INSTITUTIONAL REVIEW BOARD (IRB)

Kigali, 19th /April /2022

Christine Nyirahabimana,
PhD Candidate, Mount Kenya University / Nairobi Campus.

Approval Notice: No 273/CMHS IRB/2022

Your Project Title “*Development of Stress Management Model for Students Studying in Selected Schools of Nursing in Rwanda*” has been evaluated by CMHS Institutional Review Board.

Name of Members	Institute	Involved in the decision		
		Yes	No (Reason)	
			Absent	Withdrawn from the proceeding
Prof Kato J. Njunwa	UR-CMHS	X		
Prof Stefan Jansen	UR-CMHS	X		
Dr Brenda Asimwe-Kateera	UR-CMHS	X		
Prof Ntaganira Joseph	UR-CMHS	X		
Dr Tumusiime K. David	UR-CMHS	X		
Dr Kayonga N. Egide	UR-CMHS	X		
Mr Kanyoni Maurice	UR-CMHS		X	
Prof Munyanshongore Cyprien	UR-CMHS	X		
Mrs Ruzindana Landrine	Kicukiro district	X		
Prof Gishoma Darius	UR-CMHS	X		
Prof Donatilla Mukamana	UR-CMHS	X		
Prof Kyamanywa Patrick	UR-CMHS		X	
Prof Condo Umutesi Jeannine	UR-CMHS		X	
Dr Nyirazinyoye Laetitia	UR-CMHS	X		
Dr Nkeramihigo Emmanuel	UR-CMHS		X	
Sr Maliboli Marie Josee	CHUK	X		
Dr Mudenge Charles	Centre Psycho-Social	X		

After reviewing your protocol during the IRB meeting of where quorum was met and revisions made on the advice of the CMHS IRB submitted on 14th April 2022, **Approval has been granted to your study.**

Please note that approval of the protocol and consent form is valid for **12 months.**

Email: researchcenter@ur.ac.rw

P.O Box 3286 Kigali, Rwanda

www.ur.ac.rw

You are responsible for fulfilling the following requirements:

1. Changes, amendments, and addenda to the protocol or consent form must be submitted to the committee for review and approval, prior to activation of the changes.
2. Only approved consent forms are to be used in the enrolment of participants.
3. All consent forms signed by subjects should be retained on file. The IRB may conduct audits of all study records, and consent documentation may be part of such audits.
4. A continuing review application must be submitted to the IRB in a timely fashion and before expiry of this approval
5. Failure to submit a continuing review application will result in termination of the study
6. Notify the IRB committee once the study is finished

Sincerely,



Date of Approval: The 19th April 2022

Expiration date: The 19th April 2023

Prof Stefan JANSEN
Ag. Chairperson Institutional Review Board,
College of Medicine and Health Sciences, UR

Cc:

- Principal College of Medicine and Health Sciences, UR
- University Director of Research and Postgraduate Studies, UR

Appendix X: Request for permission to conduct study at MKUR

Christine Nyirahabimana

Muhanga, January 20th, 2022.

PhD Candidate at Mount Kenya University / Nairobi Campus

Email: nkrina2020@gmail.com / krina2020@yahoo.fr

Tel: +250788 650 325

To: The Vice Chancellor / MKUR

Dear Professor,

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH.

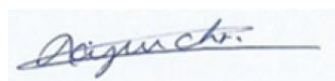
I am Christine Nyirahabimana, a student at Mount Kenya University (MKU) Thika – Nairobi Campus, pursuing a PhD program in the Department of Nursing. I am conducting research on “The development of stress management model among students’ nurses studying in selected schools of nursing in Rwanda. This research is conducted under the guidance of Doctor Connie Mureithi and Doctor Rosemary Okova, both from Mount Kenya University, Rwanda.

Mount Kenya University has reviewed and approved my research proposal including all research instruments of data collection (Introduction Letter from University and Certificate of University Ethics Review Committee attached).

Quantitative and qualitative approaches will be used. Data will be collected from undergraduate nursing students studying in selected schools of Nursing in Rwanda. Also, two (2) key informants from each institution will be contacted for interview. In the case of MKUR, a sample of 59 nursing students will be selected to participate in the main study which is scheduled in February 2022.

Dear Professor, I am writing this letter to seek your permission in conducting the above-mentioned research. Information given during this research will be for academic purpose only.

Thanking you so much,



Christine Nyirahabimana

PhD Student at Mount Kenya University.

CC:

- Head of Department / Nursing at MKUR.

Dear Christine,

This is to inform you that the permission to conduct research at MKUR is granted.

Thank you.

Dr. Catherine Wanjiku

**Ag. DEPUTY VICE-CHANCELLOR ACADEMICS AND RESEARCH AFFAIRS
MOUNT KENYA UNIVERSITY, RWANDA**

Email Address: dvcara@mkur.ac.rw

From: Dr. Catherine Wanjiku <cwanjiku@mkurwanda.ac.rw>
Sent: Tuesday, January 25, 2022 2:09 PM
To: DVC ARA Rwanda <dvcara@mkur.ac.rw>
Subject: FW: REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT MKUR

Dear Honorine,

Please inform the student she can conduct the research.

Sent from [Mail](#) for Windows

From: [VC Rwanda](#)
Sent: Thursday, January 20, 2022 5:05 PM
To: [Dr. Catherine Wanjiku](#)
Subject: FW: REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT MKUR

DVC, ARA
for your action.

From: nkrina2020@gmail.com <nkrina2020@gmail.com>
Sent: Thursday, 20 January 2022 15:55
To: VC Rwanda <vcrwanda@mkur.ac.rw>
Cc: Connie Mureithi <cmureithi@mkur.ac.rw>
Subject: REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT MKUR

Dear Professor,

I am Christine Nyirahabimana, a student at Mount Kenya University (MKU) Thika – Nairobi Campus, pursuing a PhD program in the Department of Nursing. I am conducting research on “The development of stress management model among students’ nurses studying in selected schools of nursing in Rwanda.

On this email, I attach the detailed documents for seeking your permission to conduct the above-mentioned research in MKUR.

Thanking you Dear Professor.

Stay Safe and Healthy.

Appendix XI: Feedback from MKUR

Appendix XII: Request for permission to conduct study at RHIH



ARCHDIOCESE OF KIGALI
RULI HIGHER INSTITUTE OF HEALTH (RHIH)
SAINTE ROSE DE LIMA

P.O.BOX: 1285 KIGALI TEL: (+250)781850008

E-mail: rhih2013@gmail.com // info@rhih.org Website: www.rhih.org

Office of Vice Chancellor

Ruli, on 03rd February, 2022

Ref: 0.3.8..../RHIH/2022

NYIRAHABIMANA Christine,
PhD student Candidate, Mount
Kenya University/Nairobi Campus
Email: krina2020@yahoo.fr.
Tel:+250788650325

RE: Approval for Permission to conduct research.

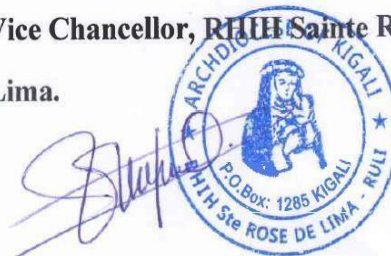
Dear Christine,

Reference is made to your letter dated on 20th January 2022, requesting permission for conducting research on “The development of stress management model among students’ nurses studying in selected schools of nursing in Rwanda”, I would like to inform you that your request has been approved.

More information you can contact **NTIRENGANYA Sylvestre** (Deputy Vice Chancellor Academic Affairs and Research, Tel: +250783136457).

Yours sincerely,

Dr. DUSHIMIYIMANA Innocent (Fr.),
Vice Chancellor, RHIH Sainte Rose de
Lima.



C.C:

- Deputy Vice Chancellors, RHIH.

Appendix XIII: Feedback from RHH

Christine Nyirahabimana

Muhanga, January 20th, 2022.

PhD Candidate at Mount Kenya University / Nairobi Campus

Email: nkrina2020@gmail.com / krina2020@yahoo.fr

Tel: +250788 650 325

To: The Vice Chancellor / Ruli Higher Institute of Health (RHH)

Dear Father,

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH.

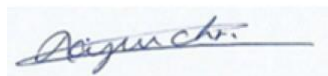
I am Christine Nyirahabimana, a student at Mount Kenya University (MKU) Thika – Nairobi Campus, pursuing a PhD program in the Department of Nursing. I am conducting research on “The development of stress management model among students’ nurses studying in selected schools of nursing in Rwanda. This research is conducted under the guidance of Doctor Connie Mureithi and Doctor Rosemary Okova, both from Mount Kenya University, Rwanda.

Mount Kenya University has reviewed and approved my research proposal including all research instruments of data collection (Introduction Letter from University and Certificate of University Ethics Review Committee attached).

Quantitative and qualitative approaches will be used. Data will be collected from undergraduate nursing students studying in selected schools of Nursing in Rwanda. Also, two (2) key informants from each institution will be contacted for interview. In the case of RHH, a sample of 25 nursing students will be selected to participate in the main study which is scheduled in February 2022.

Dear Father, I am writing this letter to seek your permission for conducting the above-mentioned research. Information given during this research will be for academic purpose only.

Thanking you so much,



Christine Nyirahabimana

PhD Student at Mount Kenya University.

CC:

- DVC Academic Affairs & Research at RHH

Appendix XIV: Signed Report of Validation Workshop of Stress Management

Model for nursing students in Rwanda

- ✓ **Date of Validation Workshop:** September 2nd, 2022.
- ✓ **Methodology of model validation:** Model validation was done in the workshop with experts in Nursing profession (Nursing education and Mental Health Nursing)
- ✓ **Purpose of validation workshop:** To check the accuracy, and applicability of the adapted model “Stress Management Model for Nursing students studying in Rwanda” and propose the recommendations to improve it.
- ✓ **Criteria for selecting workshop participants:**

We used four criteria to select the participants in the validation workshop:

- Highest academic qualification in Nursing education and or mental health Nursing (PhD),
- At least 10 years’ experience in teaching, research and / or nursing practice,
- Working in academic institution and government health institution.
- With these criteria, we considered the participants as having nursing professional knowledge and experience allowing them to review and propose the recommendations to improve Stress Management Model for nursing students in Rwanda.

A total of 4 nursing experts including 1 Professor of Nursing Education from University of Rwanda,

1 Mental Health nurse specialist from Rwanda Biomedical Center, 1 Associate Professor of community mental health from University of Rwanda and 1 Master’s prepared nurse educator from University of Rwanda have been selected to participate in the model validation workshop.

✓ **Presentation by PI:** the research principal investigator presented the research findings, followed by the original stress management model of Dr Richard Lazarus and Dr Suzan Folkman, then the adapted stress management model for nursing students in Rwanda, and the implementation plan for testing the stress management model among 39 nursing students in a selected University of Rwanda Campus.

✓ **Recommendations from the experts who attended the validation workshop:**

For improving the stress management model for nursing students in Rwanda, the participants gave the following recommendations:

- Match the concepts of the original model and the adapted model and indicate the added or removed concepts and explain why.
- When someone is highly stressed, she / he cannot do self-management: the model will be convenient to those with minor or moderate stress levels.
- Add the concept of stress appraisal.
- Intervention to manage the stress is not clear in the model. Add the intervention concept.
- The model shall have the following steps:
Step 1. Evaluate the stress.
Step 2. Appraisal:
Primary appraisal: Identifying the harm/health problems caused by the stress.
Secondary Appraisal: Identifying the resources /coping mechanisms to cope with the stress.
Step 3. Coping
Apply positive coping mechanisms. Discourage/Reduce/Abandon negative coping mechanisms.
Step 4. Reinforce: Re-evaluate and maintain the positive behaviours.
- Add the bi - directional arrows (going and coming back) between Step 1 and

Step 2


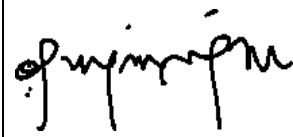


- Add the bi - directional arrows (going and coming back) between Step 2 and Step 3

- Better to read the document related to interventional research. Example of authors: Thomas and Rockman.

✓ **Conclusion**

The researcher has been requested to work on the above-mentioned recommendations and then proceed with the testing of the stress management model for nursing students in Rwanda.

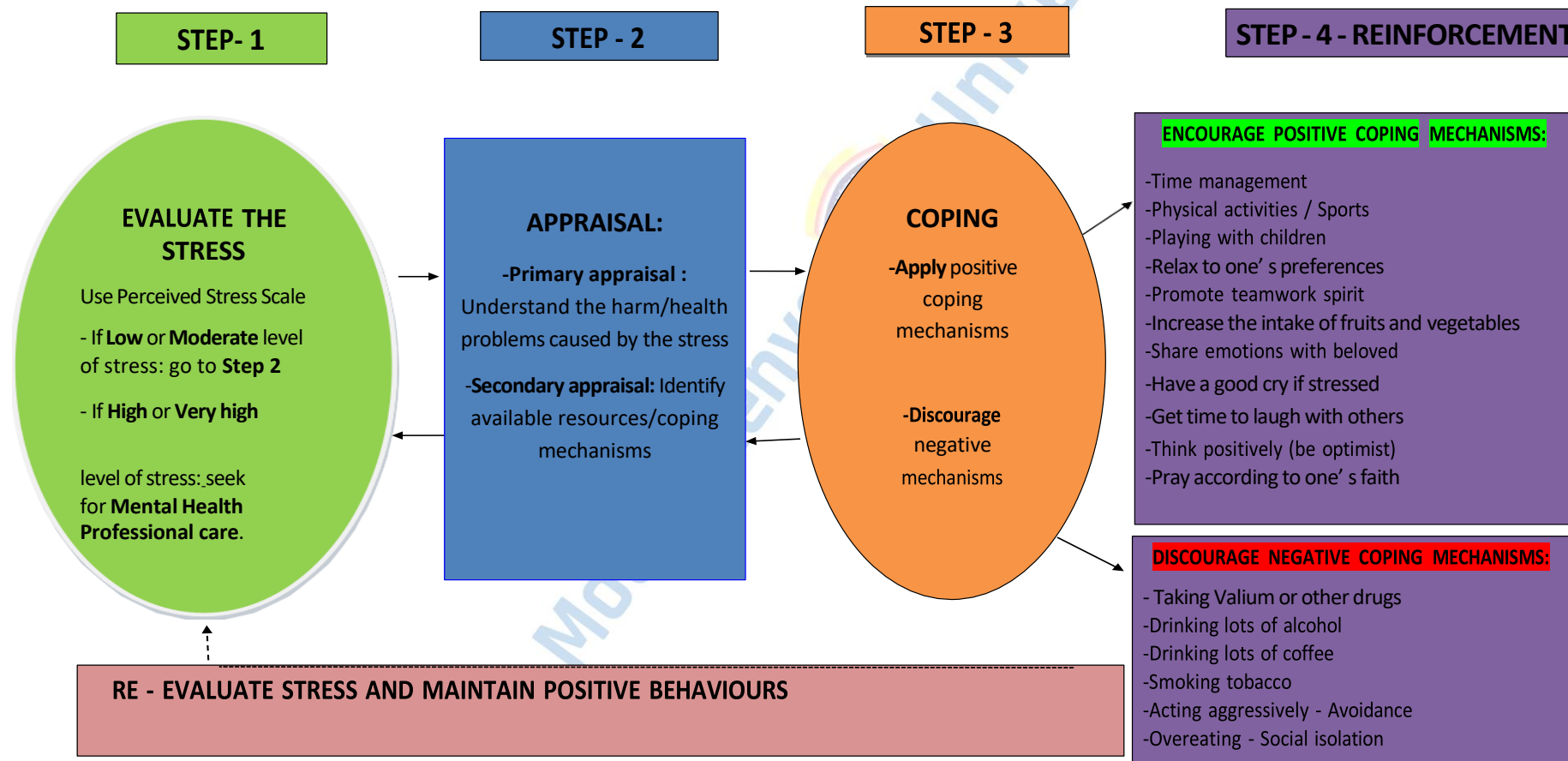
✓ **Attendance list**

Names	Qualification	Position	Institution	Phone	Signature
Assoc. Prof. Madeleine Mukeshimana	PhD in Nursing (Community health)	Assoc. Professor	University of Rwanda	+250785256459	
Prof. Adejumo Oluyinka	PhD in Nursing	Professor	University of Rwanda	+250784445859	
Doctor Jean Damascene Iyamuremye	PhD in Nursing (Mental Health Nursing)		Rwanda Biomedical Center	+250782299718	
Juliet Norah	MSN	Lecturer	University	+25078844310	

Mukankusi			of Rwanda	6	
Christine Nyirahabimana	PhD student in Nursing	Student	MKU – Nairobi / Kenya	+25078865032 5	<i>Christine</i>



Appendix XV: Corrected Stress Management Model adapted from "Lazarus and Folkman Transactional Model" for nursing students in Rwanda



Appendix XVI: Tools used in Testing the Stress Management Model for nursing students in Rwanda.

Implementation plan of Stress Management Model for nursing students in Rwanda

Time	Activities to be performed
Day 1	<ul style="list-style-type: none"> - Explanation of how to use the stress management model. Step 1. Evaluation of stress level (using the Perceived Stress Scale)
Till Day 7 (1 week)	Step 2. Appraisal <ul style="list-style-type: none"> Primary Appraisal: identifying the harm / health problems caused by the stress. Secondary appraisal: identifying the available resources / what is done to cope with the stress
Till Day 28 (3 weeks)	Step 3. Coping <ul style="list-style-type: none"> Applying the positive coping mechanisms to cope with stress Step 4. Reinforcement <ul style="list-style-type: none"> - Discouraging the negative coping mechanisms. - Encouraging and repeating the positive coping mechanisms - Reducing progressively negative coping mechanisms
Day 30	<ul style="list-style-type: none"> Re-evaluate the stress level Maintain the positive coping mechanism (s) and make it (them) habits

Mount KE

Appendix XVII: Evaluation of stress level before implementation of stress management model

Instructions

-Don't write your name on this form.

Students' Identification

Code Number:

Age in years:

Gender: Male

Female

Marital status: Married

Single Divorced Separated Widowed

Educational level: Year 1

Year 2 Year 3

Employed: Yes

No

EVALUATION OF STRESS LEVEL

Instruction: Encircle the options matching with you:

How frequently do you:	Rarely: Almost never	Sometimes: Once or twice each week	Often: Four week
Experience headaches?	1	3	5
Find it not easy to focus on work due to closing date or other responsibilities?	1	3	5
Eat, drink, or smoke for reducing anxiety or pressure?	1	3	5
Worry about your responsibilities at night and/or on weekends?	1	3	5
Lose sleep in the night thinking about things to do the next day?	1	3	5
Become disturbed due to things that have not been done correctly?	1	3	5
Tend to get irritable?	1	3	5
Lose sleep in the night and have difficulties in getting back to sleep?	1	3	5

Interrupt people while they are talking?	1	3	5
Forget about appointments or forget where	1	3	5
You have placed some objects?			
Get diarrhoea or constipation?	1	3	5
Feel very tired?	1	3	5
Get appetite changes?	1	3	5
Feel anxious?	1	3	5
Feel disorganized?	1	3	5
Totals	= ...	= ...	= ...
Grand total	=		

Other instructions:

Add the numbers from 15 items you circled.

Enter your score here: _____

Evaluate your score according to the following criteria:

Potential level of stress

- **Low** :34 or lower
- **Moderate** :35-42
- **High** :43-50
- **Very high** :51 or higher

Source: (McGraw-Hill Higher Education, 2011)

Thanks a lot for your strong support in this study!!!!

Appendix XVIII: Evaluation of stress level after implementation of stress management model

Instructions

- Don't write your name on this form.

Students' Identification

Code Number:

Age in years:

Gender: Male

Female

Marital status: Married

Single Divorced Separated Widowed

Educational level: Year 1

Year 2 Year 3

Employed: Yes

No

Evaluation of Stress Level

Instruction: Encircle the options matching with you:

How frequently do you:	Rarely: Almost never	Sometimes: Once or twice each week	Often: Four or more times each week
Experience headaches?	1	3	5
Find it not easy to focus on work due to closing date or other responsibilities?	1	3	5
Eat, drink, or smoke for reducing anxiety or pressure?	1	3	5
Worry about your responsibilities at night and/or on weekends?	1	3	5
Lose sleep in the night thinking about things to do the next day?	1	3	5
Become disturbed due to things that have not been done correctly?	1	3	5
Tend to get irritable?	1	3	5
Lose sleep in the night and have difficulties in getting back to sleep?	1	3	5

Interrupt people while they are talking?	1	3	5
Forget about appointments or forget where you have placed some objects?	1	3	5
Get diarrhoea or constipation?	1	3	5
Feel very tired?	1	3	5
Get appetite changes?	1	3	5
Feel anxious?	1	3	5
Feel disorganized?	1	3	5
Totals	= ...	= ...	= ...
Grand total	=		

Other instructions:

Add the numbers from 15 items you circled.

Enter your score here: _____

Evaluate your score according to the following criteria:

Potential level of stress

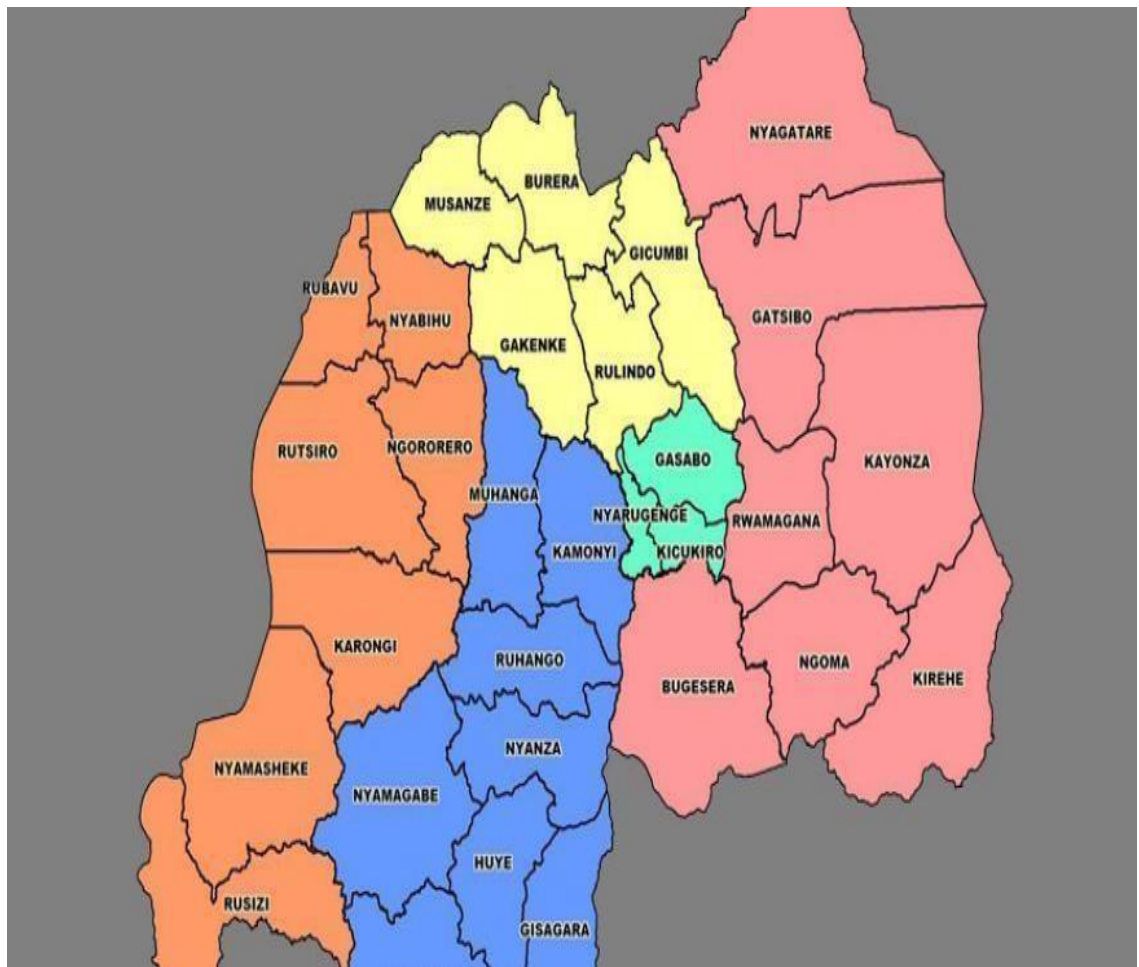
- **Low** :34 or lower
- **Moderate** :35-42
- **High** :43-50
- **Very high** :51 or higher

Note: Put (X) in place which is matching with your response

Individual Questions	Strongly agree	Agree	Disagree	Strongly disagree
Stress Management Model is easy to understand				
It is possible to apply / to use the Stress Management Model in my daily life				
For me, the Model is effective / helpful in Stress Management				
I advise other nursing students to use the Stress Management Model in their daily life				

Once again, thanks a lot for your strong support in this study!!!!

Appendix XIX: Map of Rwanda with districts



Mount Kenya

Appendix XX: Similarity Index Report

**ADAPTATION OF STRESS
MANAGEMENT MODEL FOR
STUDENTS STUDYING IN
SELECTED SCHOOLS OF
NURSING IN RWANDA**

by Nyirahabimana Christine

Submission date: 29-Apr-2024 06:48PM (UTC+0300)

Submission ID: 2365675934

File name: Christine_Nyirahabimana_Final_Thesis_29.04.2024.docx (4.89M)

Word count: 51615

Character count: 284864

ADAPTATION OF STRESS MANAGEMENT MODEL FOR STUDENTS STUDYING IN SELECTED SCHOOLS OF NURSING IN RWANDA

ORIGINALITY REPORT

15%	14%	7%	8%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

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2	erepository.mkuit.ac.rw Internet Source	1%
3	listens.online Internet Source	1%
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8	Submitted to Cebu Institute of Technology Student Paper	<1%

• • • •

181	www.wjgnet.com Internet Source	<1 %
182	Gamze TUNÇER ÜNVER, Nihal ÜNALDI BAYDIN. "Determination of Nursing Students' Perceived Stress Levels and Competency: A Cross-Sectional Study", <i>Turkiye Klinikleri Journal of Nursing Sciences</i> , 2024 Publication	<1 %
183	Moen, M, I Ndateba, A Collins, and J D Iyamuremye. "Evidence Based Practice: Valuable and Successful Examples from Nursing and Midwifery in Rwanda", <i>Rwanda Journal</i> , 2015. Publication	<1 %
184	Valerio Salvarani, Stefano Ardenghi, Giulia Rampoldi, Marco Bani et al. "Predictors of psychological distress amongst nursing students: A multicenter cross-sectional study", <i>Nurse Education in Practice</i> , 2020 Publication	<1 %

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