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Mindfulness Skills Intervention for Alleviating Stress Manifestations Among Nursing Students in Ilorin Metropolis, Nigeria

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Abstract: The literature has indicated that nursing students are among the healthcare students that experience higher level of stress; which makes it imperative to provide them with relevant skills

they can employ to overcome stressful life conditions. This study thus adopted mindfulness skills intervention to alleviate stress manifestations among nursing students in Ilorin metropolis, Kwara State, Nigeria. The objectives of the study were to examine the effect of mindfulness skills training on physical, behavioural and psychological manifestations of stress among the participants. Using a quasi-experimental study of the pre-test, post-test design, three null hypotheses guided the conduct of this study. The population of the study consisted of 234 University of Ilorin Teaching Hospital nursing school students. A purposive sampling technique was used to select 15 participants in the treatment group. An adapted "Stress Questionnaire" (with a Reliability Index of .88) from Sinha et al. (2016) was used for data collection. The data collected were analysed using percentage and paired t-test was used to test the null hypotheses formulated at .05 level of significance. The findings revealed that mindfulness skills intervention reduced the physical ($t = 19.17, p < .05$); behavioural ($t = 11.25, p < .05$); and psychological ($t = 11.51, p < .05$) manifestations of stress among the study participants. Based on these findings, it was concluded that mindfulness skills intervention is not only applicable in clinical setting but can also be applied in an educational environment; hence, a comprehensive knowledge of the process and steps involved in these training becomes imperative for school counsellors to avail themselves with for imparting positive change in clients who are going through stressful situations. Therefore, it was recommended, among others, that professional counsellors should equip nursing students with such skills in order to help them overcome the physical, behavioural and psychological manifestations of stress.

Keywords: Mindfulness skills intervention; alleviating stress manifestations; nursing students; Ilorin metropolis, Nigeria.

Introduction

The phenomenon of stress is not new in educational research parlance. Human beings have been experiencing stress since time immemorial. Stress is part of everyday life and it arises from human relationship with the constantly changing world. Stress is defined as the sense of an imbalance between the demands of the environment (also known as stressors) and a person's ability to manage those demands. The impression of danger triggers an innate response system known as the fight or flight response, which is a response of mental action through hormone signalling. In general, the stress is not entirely negative, but it can be disastrous in extreme cases. Avoiding it could make life very boring, but excessive and unchecked stress can have terrible effects on one's mental, psychological, and physical health (Essel & Owusu, 2017). Hence, the stress is unavoidable because a minimum level of it is required to spur an individual into action.

Globally, advancements in educational delivery mechanisms have challenged the traditional higher education delivery system, which consists of a classroom setting with student and lecturer interactions. So, academic stress is one of the greatest challenges that students face in higher institutions of learning, particularly, among nursing students. Simonelli-Munoz, et al. (2018); Torre et al. (2018); and Rodriguez-Rey et al. (2019); noted that nursing students and those in other health-related disciplines have higher levels of stress than the general population. Akdeniz et al. (2018) showed in their finding among nursing students a high or severe level of stress; due to their exposure to various stressors that may hinder their learning and performance during nursing education. This follows that nursing students are experiencing significant levels of stress which usually affects their psychosocial experiences and health negatively.

Stress is a subjective mental distress originating from multiple aspects of the entire stressful life events. Stress can manifest physically, behaviourally and psychologically. The physical component manifests through tense muscles, weight loss, constant headache, sleep difficulty, fast heartbeat, and profuse sweating among others. Behavioural component is usually shown when an individual becomes aggressive, fidget, withdrawn from a social situation, engages in eating or smoking behaviours, has poor educational achievement, abuse substances, and procrastinating. Depression, suicidal thoughts, attention difficulties, loss of memory, burden, irritability, worry, excessive fear and other difficulties are the commonly observed psychological component of stress (Bjorkman, 2007).

The stress among nursing students revolves around three main stress factors; namely academic stressors (such as tests and evaluations, fear of education failure, workload problems), clinical stressors (such as fear of making a mistake while on practical, negative responses to patients' death or pains, professional expectation of nursing programme) and personal/social stressors (such as financial problems, family issues, an imbalance between the housework/school study) (Blomberg et al., 2014). Jacob and Einstein (2016) attributed the causes of higher manifestation of academic stress in healthcare students to the expansion of the knowledge base of such profession and the acquisition of clinical skills which demand a significant amount of both theoretical and education practice hours.

Since the stress is inevitable, coping with the stress is important for students' academic and overall life success. Ajibade et al. (2016) revealed that many nursing students lack effective coping skills to manage stress. While some are involved in taking alcohol and other substances, some usually visit friends or engage in social media chat, which may in turn contribute to their level of stress. In this regard, the researchers deem it imperative to introduce mindfulness skills training and solution-focused brief counselling technique as stress-coping interventions among nursing students.

Studies like those by Chiesa and Serretti (2009) and Eberth and Sedlmeier (2012) have shown that interventions based on mindfulness significantly reduce stress. Mindfulness-Based Stress Reduction (MBSR), an accessible psycho-educational eight-session program, is a development of mindfulness skills training from Buddhist mindfulness meditation practices. It was subsequently included in the Cognitive Behaviour Theory under the name Mindfulness-based Cognitive Therapy (MBCT), which emphasizes cultivating detached observation and awareness of the contents of consciousness to alter how people react to occurrences in their lives. It contributes to several beneficial psychological effects, such as improved behaviour regulation, greater subjective well-being, and decreased psychiatric symptoms and emotional reactivity (Keng et al., 2011).

Problem Statement

Trainee nurses are supposed to be physically and psychologically fit to be able to surmount the academic rigors in nursing schools. However, high level of stress has been shown to have a negative influence on nursing students' overall adjustment. Based on the researchers' (as the school counsellor) observation and interaction with some nursing students on the level of stress they experienced during the course of their study and their coping strategies with the stressful situation; many of them complained of inability to manage their time, others talked about cumbersome workload, juggling from the teaching hospital to their school for practical, attending early morning lectures, lack of time for social activities, impromptu examinations among others.

Many of these students are using negative coping strategies such as the abuse of alcohol and other psychoactive substances, excessive sleeping, engaging in illicit sexual activities, indulging in excessive social media chatting and night clubbing. Consequently, they experienced negative changes in their psychosocial lives and long-term physical and mental well-being. They may also become irritable, show

a lack of concentration, decreased academic performance, poor inter-personal relations and poor academic achievers; some may become half-baked nurses after being employed and that has resulted in the current shortage of nurses and incompetent ones found in different hospitals in Nigeria causing a great number of havocs to the citizens.

There is a shortage of experimental studies on coping strategies that help in navigating stress among nursing students in Nigeria. Prominent research in this regard were survey studies (Dike et al., 2017), some focused on the solution to stress experienced by university students or the general population (Ilbay & Akin, 2014); and students in other medical-related fields (Spinelli, et al., 2019). Therefore, there is a need to fill the existing gap in the previous studies by investigating the mindfulness skills intervention on stress manifestations among nursing students in the Ilorin metropolis, Kwara State.

Literature Review

The stress is an unavoidable condition that every individual is bound to experience regardless of their socio-demographic variations. Fink (2016) and Fink (2017) described the stress as a psycho-physiological reaction that occurs in response to felt demands. In the context of nursing students, stress is considered an overload of tension that is generated by demanding situations or pressure either from academic or other life events, which may lead to different mental health challenges. Such stress may either be a positive or negative reaction. The positive stress allows or aids individuals navigating daily life challenges; while the negative part increases a person's vulnerability to other mental health problems such as anxiety or depression (Schonfeld et al., 2016; Segal et al., 2023). According to Soliman (2014), excessive stress can increase the likelihood of delinquent behaviour including cheating and poor performance in addition to causing anxiety and a loss of objectivity (Marks, 2023). In this regard, managing stress is an important factor in enabling nursing students to excel in their healthcare studies and one of the important stress management strategies is the mindfulness intervention.

According to Tams (2023), mindfulness training includes both formal meditation exercises (such as paying attention to the body, lying on the ground, or moving slowly while being aware of one's surroundings) and informal exercises (such as paying close attention to what one is doing or experiencing at any given time). People may cope with stress by being aware of their thoughts, their bodies and themselves. Turow (2023) stated that mindfulness meditation is both a mindset and a technique for alleviating personal suffering and growing in wisdom and compassion. Modern psychology views mindfulness as a way to heighten awareness and respond to mental processes that result in emotional pain and unhelpful behaviour in the best possible way (Gu et al., 2015). Janssen et al. (2018) claimed that mindfulness is an improved attention to and awareness of current experience or present reality. When someone is aware, they are conscious of what they are going through without making those feelings the centre of their attention. Focusing conscious awareness on certain experiences is the activity of paying attention.

Simply because mindfulness encourages acceptance of stressors rather than avoidance of them, it can be a useful stress management technique (Chaskalson & Hadley, 2015). Additionally, attentive observation helps people learn to control their attention, which is a valuable ability for those who struggle to finish critical tasks because they are side-tracked by anxieties, memories, or bad moods (Chaskalson & Hadley, 2015). An individual may discover how to more effectively assess their stressors if they see things as they truly happen. People who practice mindfulness may be able to see their pressures as more tolerable and less dangerous. By enhancing one's self-control and ability to

concentrate, mindful awareness can also assist people in better converting their intentions into behaviour (Jinpa, 2019).

According to Jinpa (2019), the practice of mindfulness is characterised by four key abilities: attentive observation of one's internal and external experience, mindful description of one's observations, acting with awareness, and non-judgmental acceptance. Attention and presence, compassion for oneself and others, empathy, and the ability to regulate one's emotions are therapeutic traits that can be developed via mindfulness practice (Schuman-Olivier et al., 2020). The goal of the MBCT is to help people become more conscious of their thoughts and feelings so they can connect them in a broader, detachment, detached perspective as mental events rather than cling to or concentrate on those unpleasant thoughts (Sedlmeier et al., 2023). Sedlmeier et al. (2023) stated that mindfulness training aids a person in developing the capacity to be kind and understanding of his or her present thoughts, feelings, and physical sensations. Between one's perception (such as a stressful stimulus) and response (thoughts, speech, and actions), it generates a psychological "space." Individuals are therefore able to respond positively rather than impulsively reacting with negative feelings. In other words, mindfulness aids in the mobilisation of inner resources that enable one to meet challenges head-on, to be conscious of and position oneself to deal with pressure, and to go past it.

The usefulness of mindfulness skills intervention in overcoming stressful situations has been demonstrated several scientific investigations. For instance, a study by Felton et al. (2015) looked into how mindfulness training affected Southern Sweden students' feelings of stress. The study's findings showed that the intervention had a positive impact on the participants' capacity to anticipate stress as well as their levels of confidence and compassion in dealing with it. Additionally, Sivasubramoney et al. (2017) discovered in their study that the general public, which is plagued by daily stress, can try a mindfulness intervention. Similar results were reported by Galante et al. (2018), Solhaug et al. (2019), and Spinelli et al. (2019), where the intervention groups reported a small reduction in psychological distress, no harm to oneself or others, or suicidality and fostered long-lasting effects on mental distress and coping in healthcare students at post-interventions.

Research Objectives

The objectives of the study include to examine:

1. The effect of mindfulness skills intervention on physical manifestation of stress among nursing students in Ilorin metropolis.
2. The effect of mindfulness skills training on behavioural manifestation of stress among nursing students in Ilorin metropolis.
3. The effect of psychological skills training on physical manifestation of academic stress nursing students in Ilorin metropolis.

Hypotheses

The following null hypotheses were tested:

H₀₁: There is no significant effect of mindfulness skills training on physical manifestation of stress among nursing students in Ilorin metropolis.

H₀₂: There is no significant effect of mindfulness skills training on behavioural manifestation of stress among nursing students in Ilorin metropolis.

H₀₃: There is no significant effect of mindfulness skills training on psychological manifestation of stress among nursing students in Ilorin metropolis.

Research Methodology

General Background

The research design adopted for this study was the quasi-experimental design which involved the pre-test and post-test design. It is often used to evaluate the effect of a treatment, perhaps, a type of psychotherapeutic or educational intervention on one or more dependent variable(s). The adoption of this research design went with the assertion of Shuttleworth (n. d.) that without undertaking extensive pre-screening and randomisation processes, a quasi-experimental design reduces the time and resources needed for experimentation. The researcher thus chose quasi-experiment because of its strength to maximise internal and external validity in the effects of mindfulness skills training on stress among nursing school students in the Ilorin metropolis. The design is graphically illustrated as follows:

G1 O1 ----- X1 ----- O2

Where: G1 = Experimental group (Mindfulness Skills Training)

O1 = Pre-test

O1 = Post-test

X1 = Treatment

Selection and Description of Participants

All 234 nursing students studying at the University of Ilorin Teaching Hospital (UITH) School Complex, Maraba, Ilorin constitute the population of this study. However, the nursing students in the 200 level were the target population of the study. This is based on the fact that they were at the intermediate level and just started combining clinical training with academic work, with which they have been struggling to cope effectively; thus, many of them are employing unhealthy coping strategies towards stress; as observed by the researchers. The sample size for this study was 15 participants. This is in line with the submission of Ezhumalai et al. (2018) who stated that between 6- and 15 clients are required in group counselling. The sample was selected using the purposive sampling technique. A purposive sampling technique was used to select 15 nursing students with high levels of stress. The pre-test exercise was used to determine those qualified to be in the treatment or experimental group.

Instrument and Procedures

The instrument used for data collection was an adapted Stress Questionnaire from Sinha et al. (2016). The instrument has two sections; A and B. Section A consists of the demographic data of the respondents. The bio-data information of the participants includes; gender and age; while section B of the instrument contains 30 items, with 3 sub-sections and 10 items under each sub-section.

The Stress Questionnaire was segmented into three categories physical, behavioural and psychological dimensions of stress. The scoring method adopted for the instrument was a five-point Likert rating format of; Always - 5; Often - 4; Sometimes - 3; Rarely - 2; and Never - 1 respectively. However, there is no standard for the number of points on rating scales and common practice varies widely (Krosnick & Presser, 2010). However, experts in measurement and evaluation (Dawes, 2008) have contended that the large number of intervals provides respondents with greater choice and

discrimination to find the point that is most reflective of their rating and it is also quite simple to analyse the research data; hence, the use of five-point rating system.

The content validity of the adapted Stress Questionnaire was determined by experts in the field of Guidance and Counselling, Educational Psychology; and Measurement and Evaluation. The instrument was subjected to an alternate reliability method to determine its internal consistency and 0.88 index of Cronbach Alpha statistics was obtained; which adjudged the instrument appropriate for the conduct of the study. The scoring procedure is illustrated in table 1 as follows:

Table 1

Level of Stress Scoring Method

Level of Stress	Score range	No of Items	Highest score	Lowest score
Lower stress	Between 1 and 60			
Moderate stress	Between 61 and 90	30 (10 items/segment)	150 (5 * 30)	30 (1 * 30)
High stress	Between 91 and 150			

The highest score participants can get for each of the items on the instrument is 5, while the lowest score is 1. However, based on the responses to the 30-items scale, the maximum score a participant could get when all items are responded to is 150 (that is, 5 * 30), while the lowest score is 30 (that is, 1 * 30). Given this, participants who scored between 1 and 60 were considered to having a low level of stress, participants between 61 and 90 ranges of score were regarded as average levels of stress; while those between 91 and 150 score range were regarded as having a high level of stress. At the pre-test stage, those with higher and average level of stress were considered for participation in this study; while those with lower levels of stress were exempted. The scoring format for the instrument was applied to all participants for both pre-test and post-test in the study.

Treatment Procedure

The mindfulness skills intervention template was adapted from the book entitled “Mindfulness-Based Cognitive Therapy: The CBT Distinctive Feature Series” (Wills, 2022). The book provides the practical and accessible applications of mindfulness skills practice. At the initial stage of the session and having created a safe and conducive counselling environment, the researcher introduced himself and did orientation for the class. This was done by honouring the commitment they have all made, asking that they come and continue coming with an open mind and heart; setting the ground rules regarding confidentiality, participation and timekeeping; and asking the participants to tune in to their intentions for coming and then pair up and introduce themselves to each other and then to the group as a whole.

Table 2

Mindfulness Skills Training Template

Week 1	Automatic Pilot
Activities	Setting the group rules and regulations, raising awareness and body scan meditation
Assignment	A 45-minute body scan meditation.
Week 2	Dealing with Barriers
Activities	Body scan meditation. Ten minutes of mindfulness of breathing.
Assignment	Bringing attention to a different routine activity.
Week 3	Mindfulness of the Breath and Body Movement
Activities	Standing mindful stretches, followed by sitting meditation focusing on awareness of breath and body.
Assignment	Keeping a daily record of the experience of an unpleasant event. 3 minutes breathing space three times per day.
Week 4	Staying Present
Activities	5 minutes mindfulness of seeing or hearing.
Assignment	Sitting meditation. 3-minutes breathing space
Week 5	Acceptance and Allowing/Letting Be
Activities	Exercise exploring habitual patterns of reaction and the potential use of mindfulness skills to facilitate greater responsiveness to present-moment experience.
Assignment	Sitting meditation – 3 minutes breathing space
Week 6	Thoughts are not facts
Activities	Sitting meditation; 3 minute breathing space
Assignment	Beginning to develop a personal relapse signature and action plan.
Week 7	How can I best take care of myself?
Activities	Explorations of the links between activity and mood. Generate list of daily activities and consider which feel “depleting” or “nourishing” and which give a sense of “mastery” or “pleasure”. Consider ways of increasing the “nourishing” activities. Identifying relapse signatures and actions to deal with the threat of relapse/recurrence
Assignment	Develop action plan to be used in the face of uncomfortable experience.
Week 8	Using what has been learned to deal with future experience
Activities	Ending meditation.
Assignment	Set a plan of home practice that they can sustain for the next month. The follow up session was done through a phone call.

Ethical Consideration

Permission and cooperation were sought from the authority of the healthcare institution in which this study was carried out. Confidentiality on the participants’ information was maintained and they voluntarily participated in the research exercise.

Data Analysis

The data collected was analysed using paired t-test statistic. A paired t-test is used when a researcher is interested in the difference between two variables for the same subject; an instance is where same participants are tested repeatedly; before and after receiving the treatment (Hayes, 2023). The statistical software was the SPSS statistical package (version 23).

Research Results

The descriptive statistic of frequency and percentage was used to presents the demographic profiles of the participants. This is illustrated as follows:

Table 3

Percentage Distribution of Participants by Gender

Gender	Frequency	Percentage %
Male	3	20.0
Female	12	80.0
Total	15	100.0

Table 3 presents the percentage distributions of participants' gender in the mindfulness and solution-focused groups. The table shows that, 3 (20.0%) of the participants were males; while 12 (80.0%) were females. This implies that, female nursing students were more represented in the intervention than their female counterparts.

Table 4

Percentage Distribution of Participants by Age

Age	Frequency	Percentage %
19-22 years	12	80.0
23 years & above	3	20.0
Total	15	100.0

Table 4 presents the percentage distributions of participants' age in the mindfulness and solution-focused groups. The table shows that, 80 (80.0%) of the participants were between 19-22 years of age; while 20 (20.0%) were between 23 years and above. This suggests that, nursing students in the adolescence stage of development were more represented in the research experiments than their older counterparts.

H₀₁: There is no significant effect of mindfulness skills training on physical manifestation of stress among nursing students in Ilorin metropolis.

Table 5

Paired Sample t-test Comparing Pre-Test and Post-Test Intervention on Physical Manifestation of Stress among Participants

Variables	N	Mean	SD	df	Cal. t	p-value
Pre-test	15	31.00	2.976			
				14	19.17*	.000
Post-test	15	13.87	1.642			

Note. Sig. at $p < .05$

Table 5 shows that at the degree of freedom (df) of 14, the calculated t-value is 19.17 ($p = .000 < .05$). This indicates that there is statistically significant effect of mindfulness skills intervention on physical manifestation of stress among nursing students in Ilorin metropolis; hence, the null hypothesis is rejected.

H₀₂: There is no significant effect of mindfulness skills training on behavioural manifestation of stress among nursing students in Ilorin metropolis.

Table 6

Paired-Sample t-test Comparing Pre-Test and Post-Test Intervention on Behavioural Manifestation of Stress among Participants

Variables	N	Mean	SD	df	Cal. t	p-value
Pre-test	15	30.53	5.527			
				14	11.25*	.000

Post-test	15	13.07	1.438			
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Note. Sig. at $p < .05$

Table 6 shows that at the degree of freedom (df) of 14, the calculated t-value is 11.25 ($p = .000 < .05$). This indicates that there is statistically significant effect of mindfulness skills intervention on behavioural manifestation of stress among nursing students in Ilorin metropolis; hence, the null hypothesis is rejected.

H₀₃: There is no significant effect of mindfulness skills training on psychological manifestation of stress among nursing students in Ilorin metropolis.

Table 7

Paired Sample t-test Comparing Pre-Test and Post-Test Intervention on Psychological Manifestation of Stress among Participants

Variables	N	Mean	SD	df	Cal. t	p-value
Pre-test	15	28.00	5.210			
				14	11.51*	.000
Post-test	15	15.07	1.580			

Note. Sig. at $p < .05$

Table 7 shows that at the degree of freedom (df) of 14, the calculated t-value is 11.51 ($p = .000 < .05$). This indicates that there is statistically significant effect of mindfulness skills intervention on psychological manifestation of stress among nursing students in Ilorin metropolis; hence, the null hypothesis is rejected.

Discussion

The study's findings showed that compared to the pre-test group, nursing students who participated in the post-test experienced a significant decrease in physical stress. Physical signs of stress, such as headaches, stiffness in the muscles and exhaustion, were reduced in the mindfulness group. These findings imply that teaching mindfulness techniques may be a useful intervention for nursing students to reduce physical stress. There are few studies like this one that use rigorous research designs, even though this a non-randomised, without-control design was used. The generalisability and reproducibility of the findings may be constrained by the lack of randomised controlled trials. Small sample sizes are another issue with studies like the one under consideration. For instance, the study by Smith et al. (2020) is no exception. The small sample size reduced the statistical power of this study and increased the likelihood of Type II errors. Future studies should thus aim for larger sample sizes to enhance the validity and generalisability of their findings.

Previous studies on mindfulness practices with different demographics have produced encouraging stress-reduction effects. This finding is consistent with other research that showed mindfulness has a positive impact on stress reduction among healthcare workers like nurses. The research by Regehr et al. (2014), Burton et al. (2016), and Smith et al. (2020), which focused on the physical signs of stress in nursing students, added to this body of knowledge. The majority of this research concentrates on the immediate results of mindfulness therapies. Future research should look into how mindfulness training affects nursing students' long-term physical stress levels. It would be

insightful to investigate whether the advantages persisted over time and to look at potential moderators and mediators of long-term impacts.

Future studies could compare several mindfulness-based therapies to find the best strategy for lowering physical stress in nursing students. One way to determine the ideal length and intensity of mindfulness training is to compare the mindfulness-based stress reduction programs with shorter mindfulness interventions. The incorporation of mindfulness training into the nursing curriculum is another unknown topic. The viability and effectiveness of teaching nursing student's mindfulness techniques might be investigated through research, which would also look at how it affects students' resilience, stress management, and general well-being.

This study also showed a substantial decrease in behavioural stress among participants who followed the mindfulness-based stress reduction program compared to the pre-test stage. The interpersonal relationships and emotional weariness were reduced in the mindfulness group. These findings imply that teaching mindfulness techniques could help nursing students reduce behavioural stress and improve their overall wellbeing. While numerous researches have demonstrated the effectiveness of mindfulness interventions in lowering behavioural stress among nursing students (de Vibe et al., 2013; Whitesman & Mash, 2015), there is significant variation in the intervention components across studies. It is challenging to evaluate study results and identify the best elements of mindfulness therapies because of this diversity. Similarly, the majority of studies examining the effects of mindfulness interventions on behavioural stress among nursing students are cross-sectional or short-term longitudinal studies. There is a lack of long-term follow-up studies to analyse the sustained effects of mindfulness interventions on behaviour stress.

Previous studies on mindfulness therapies with different groups have produced encouraging outcomes in terms of lowering stress and enhancing wellbeing. The results of the studies conducted by Sivasubramoney, et al. (2017), Galante et al. (2018), and Zhang et al. (2020) are in line with earlier studies that have shown the value of mindfulness-based therapies for lowering behavioural stress in healthcare professionals. Future studies might look at the best aspects of mindfulness programs for lowering behavioural stress in nursing students. The most efficient solution for nursing students may be found by contrasting several methods such as cognitive-behavioural therapy, mindfulness-based cognitive therapy, and programs for reducing stress based on mindfulness. Future studies might concentrate on figuring out the processes by which mindfulness therapies reduce behavioural stress in nursing students. Examining potential moderators and mediators, such as self-compassion, emotion regulation, and resilience, could provide valuable insights. The majority of studies investigating the effects of mindfulness interventions on behavioural stress among nursing students have been conducted in Western countries. Future studies should examine the generalizability of these findings to other cultural contexts and diverse populations.

The finding further revealed that, when compared to the pre-test stage, nursing students who took part in the mindfulness-based stress reduction programme had a significant decrease in psychological stress. In addition to higher levels of self-compassion and mindfulness, the mindfulness group showed lower levels of perceived stress. These findings imply that teaching mindfulness techniques can help nursing students reduce their psychological stress. Studies exploring the impact of mindfulness exercises on psychological stress in nursing students include a range of intervention lengths. Longer interventions (like 8 weeks) were employed in certain research (like those by Felton et al., 2015; de Vibe et al., 2013) whereas shorter interventions (like 4 weeks) were used in others. The variations in intervention length make it challenging to determine the optimal duration of mindfulness training for maximum stress reduction. This study lacked well-designed control groups, which limits the ability to

attribute the observed effects solely to mindfulness training. Some studies utilise passive control groups, such as waitlist controls, which may introduce confounding variables and reduce the validity of the findings.

Previous studies on mindfulness practices with a range of populations have consistently demonstrated beneficial effects on psychological stress reduction. The results of the studies by Lu et al. (2016), Solhaug et al. (2019), and Spinelli et al. (2020) were consistent with other studies that had shown how mindfulness training reduced psychological stress in a variety of populations, including students and healthcare workers. Future studies might examine the varying impacts of various mindfulness practices (such as group versus individual, in-person versus online, etc.) on psychological stress in nursing students. It would be easier to identify the most appropriate and approachable mindfulness interventions for this population by comparing different formats. It is necessary to carry out further research on the processes that underlie the success of mindfulness therapies. Examining potential moderators and mediators (such as personality factors, prior mindfulness experience, and self-compassion) may provide insights into the precise mechanisms through which mindfulness skills affect psychological stress in nursing students. The majority of studies looking at how mindfulness practices affect psychological stress in nursing students employ a short-term outcome-oriented approach. Future studies could look into the impact of mindfulness training over the long term to see if the advantages persist.

Conclusion

The research findings demonstrated a positive effect of mindfulness skills on physical, behavioural and psychological stress among nursing students. However, future research is needed to address the limitations of existing studies, compare different mindfulness interventions and explore the long-term effects and integration of mindfulness in nursing education. Also, there is a need to examine optimal components of mindfulness interventions, investigate potential mediators and moderators, identify mechanisms of change, and investigate the findings generalisability. These areas offer potential for further investigation and hold promise for enhancing the well-being of nursing students and improving their ability to manage stress.

Recommendations

Based on the findings, it was recommended that:

1. Counsellors should be trained on appropriate ways or processes involved in the use of mindfulness skills training to combat stress among nursing school students. Having in-depth knowledge of this will help them assist students better to adjust effectively to their life endeavours and perceive stress as a motivation to accomplish a task effectively.
2. Professional counsellors should adopt mindfulness skills intervention on varying manifestations of stress (physical, behavioural and psychological) experienced by nursing students.
3. Since the practices of mindfulness skills programmes reinforce coping skills with stress among nursing students, professional counsellors can utilize those techniques in the context of preventive guidance services by, on a regular basis, educating nursing educators and healthcare professionals in the school system on ways to adopt these strategies in overcoming stressful conditions.

Limitations of the Study

One of the limitations of this study was the sample size of 15. With a small sample size, the findings may have limited generalisability to the broader population. The smaller the sample, the greater the

risks of obtaining results that are specific to the sample itself, rather than reflecting the true population characteristics. In addition, a smaller sample size may reduce the statistical power of the study. Insufficient power increases the risk of false-negative results, where a real effect is not detected due to the small sample size. The smaller sample size has wider confidence intervals, which reflect the range of values within which the true population parameter is likely to fall. However, this sample size was considered appropriate because of the difficult access to the participants, as their academic schedule was so cumbersome that it hardly gave room for the researcher to conduct the exercise. This is also necessary to detect the larger effect of the independent variable on the dependent variable. According to Serdar et al. (2021), if the effect being studied is large, a smaller sample size may be sufficient to detect a statistically significant effect. With a large effect size, the sample size requirement decreases, as larger effects are generally easier to detect with smaller samples.

Another limitation of this study was the lack of a control group, which might affect the internal validity of its findings. Without a control group, it may become challenging to establish a causal-effect relationship between the independent variable (mindfulness training) and the dependent variable (stress). There may be other factors at play, such as participants' pre-existing characteristics, external events, or other concurrent interventions, that could account for the observed changes. However, the study lacks a control group because it was conducted in an educational setting where it was difficult to assign the students to different classrooms due to logistics limitations and educational policy. Given these implications, it is important to interpret these findings cautiously. While this study can provide valuable insights and generate hypotheses, it may not allow for strong causal claims or generalisability beyond the specific sample and context.

Suggestions for Future Research

The quasi-experimental study on mindfulness skills intervention for alleviating stress manifestations among nursing students in Ilorin metropolis, Nigeria provides valuable insights into the potential benefits of mindfulness in a specific population. To further enhance the understanding of this topic and contribute to the existing body of knowledge, it was suggested that future researchers should:

- Conduct a longitudinal study with an extended follow-up period to examine the long-term effects of mindfulness skills intervention on stress reduction among nursing students to further advance our understanding of this topic and add to the body of knowledge already in place. This would assist in ascertaining whether mindfulness benefits endure after the intervention period and whether its effects are sustainable.
- Examine how well mindfulness skills interventions work in comparison to other stress-reduction strategies or tactics, like cognitive-behavioral therapy or relaxation methods. This would give a thorough grasp of mindfulness's relative effectiveness over other well-researched therapies and determine the best strategy for nursing students in the city of Ilorin.
- Explore the lived experiences and perspectives of nursing students who have received mindfulness skills instruction using qualitative research techniques like focus groups and interviews. This would offer a more thorough comprehension of the individualized experiences, difficulties, and advantages linked to mindfulness in the context of nursing students' stress management.
- Determine how mindfulness interventions can be culturally adjusted for nursing students in the city of Ilorin. Examine the potential impact of cultural variables on the adoption, efficacy,

and acceptance of mindfulness practices in Nigeria. The results of this study will be useful in adapting mindfulness therapies to the target population's unique cultural demands and preferences.

- Examine the impact of mindfulness therapies affect nursing students' academic achievement. This will help determine whether adopting mindfulness techniques might lower stress levels and lead to better academic results, such as test scores, GPA, or clinical performance.

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