Innovations

Efficacy of Mindfulness-Based Cognitive Therapy on Suicidal Ideation among Nigerian Undergraduatess and the Mediating Effect of Age, Gender, and Level of Study

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Abstract: *The phenomenon of suicide ideation seems to be very rampant in universities due to the frustration and restlessness that is associated with learning. Parents and teachers have expressed their displeasure with stories of undergraduates' untimely death through suicide. This study, therefore, examined the extent to which mindfulness-based cognitive therapy will be effective in the treatment of suicide ideation among undergraduates and the mediating effect of age, gender, and level of study. The study involved randomly assigning 234 participants between ages 16 and 25 years old, with mean age of 18.47±1.48 who had statistically significant suicide ideation scores to experimental and control groups. Two research hypotheses were posed andstatistical tools of Structural Equation Model (SEM), line chart, and independent t-test aided the analysis of the hypotheses. The significance criterion for testing the hypotheses was set at p<0.05. Results of the analysis revealed that the experimental groups' suicide ideation scores were significantly lower at the post-test (t = 5.063, p<0.05). Similarly, there was no significant mediation path of age, gender, or level of study on the effect of mindfulness-based cognitive therapy -0.021 (0.681). To reduce global suicide rates, it is essential to integrate these findings into existing research on suicide. This would enable earlier identification of warning signs and the development of more effective interventions.*

Keywords: *efficacy, mindfulness-based cognitive therapy, suicide ideation, undergraduates, age, gender, level of study.*

Introduction

The occurrence of suicide is on the rise globally, and is currently very rampant in Nigeria Universities like in most Universities in the world.Vigorous suicidal ideation involves assembling plans to commit suicide or formulating a plot to do so (Kumar et al., 2017). Suicide ideation is not a simple urge to die, but a dangerous mood and a clear symptom of mental illness, which encompasses thoughts about death and organised attempts on one's own life (Klonsky et al., 2016). With undergraduates, thoughts are symptomatic of severe psychological troubles which can result from ordinary causes such as studying stress, loneliness, and unfulfilled goals (Eisenberg et al, 2013).Researchers have studied suicidal ideation among male and female first-year college students. Suicide rates in males are 2 to 4 times higher than those in females, while suicide attempts occur 3 to 9 times more frequently in females (Mortier et al., 2017).

Most undergraduates, particularly those attending universities in developing countries like Nigeria, are especially vulnerable to mental health issues, including suicidal ideation, low self-esteem, sexual abuse, psychological abuse (Gesinde, 2020;Okunlola, Odukoya&Gesinde, 2021;Okunlola, Gesinde, &Odukoya, 2022). This is partially attributed to the fact that university students are exposed to certain stressors which may include: academicrelated stress, economic stress, and stress resulting from difficulties in adjusting to university life (Eisenberg et al., 2013). To Nigerian undergraduates, these difficulties are worse due to socio-economic factors within the country that include a high unemployment rate, lack of mental health facilities, and cultural perceptions that often undervalue mental health (Ibrahim et al., 2013). The interaction of these aspects results in a setting that might overload students with emotional pressure leading to the progression of depression and anxiety as well as frequent suicidal thoughts. Research has established that transitioning into university coupled with the pressure for performance due to scholarship and social expectations increase the level of psychological stress among students to the extent of generating suicide ideation (Bayram et al., 2008).

The integrated motivational-volitional model of suicidal behaviour (IMV) proposes that suicidal behaviour results from a complex interplay of factors, the proximal predictor of one's intention to engage in suicidal behaviour (O'Connor et al., 2011). The purpose, in turn, is determined by feelings of entrapment, where suicidal behaviour is seen as the salient solution to life circumstances (Sandford et al., 2022). Defeat/humiliation appraisals trigger these feelings of being trapped, often associated with chronic or acute stressors. The transitions from the defeat/humiliation stage to entrapment, from entrapment to suicidal ideation/intent, and ideation/intent to suicidal behaviour are determined by stage-specific moderators (factors that facilitate/obstruct movement between stages) (Ballegooijen et al., 2022). Also, background factors (deprivation, vulnerabilities)

and life events (relationship crisis), which comprise the pre-motivational phase (before the commencement of ideation formation), provide the broader biosocial context for suicide (Ballegooijen et al., 2022).

In explaining the IMV model, De Beurs et al. (2019) simplify the three-phase factors of the IMV model. The pre-motivational phase factors assess background factors (perfectionism), environmental factors, and triggering events. Factors considered within the motivational phase are defeat, entrapment, (lack of) social support, etc. Thus, these model factors illustrate how suicidal thoughts occur in some individuals. However, volitional phase factors control the transition from suicidal thinking (ideation/intent) to suicidal behaviour; they embody exposure to suicide, fearlessness concerning death, and impulsivity (Sandford et al., 2022). So, the main driver of suicide ideation within the IMV model is conceptualised as entrapment.

The level or year of study is one of the important determinant of suicide ideation among undergraduates. Existing research shows that while undertaking undergraduate studies, the level of suicide ideation tends to rise as the year of study progresses due to the varying levels of psychological demand. First-year university students are often dealing with issues such as transition, self-management, and academic pressure, therefore stress and anxiety levels are significantly quite high at the beginning of the academic year (Beiter et al., 2015). Since such stressors emerge as students' progress academically, they may shift in the later years of a student's education as other stressors such as the pressure of high academic load and the reality of job hunting take over (Bashir & Nawaz, 2013). Final-year students, more than any other set, experience peak academic stress, and with uncertain post-graduation prospects, they face an increased risk of depression and suicidal thoughts (Voelker, 2003). Studies have also shown that students in their last two years of study present with the highest levels of psychological distress. Thus, active interventions should be made for students in their penultimate or final semesters (Hirsch et al., 2019).

Age bears a very close connection to the level of the study and is among the most influential factors that define the mental health status of undergraduates. Undergraduates are typically in late adolescence to early adulthood, a developmental stage marked by significant psychological and emotional changes (Arnett, 2000). This stage of life is characterised by identity formation, higher levels of self-governance, and setting of future career and personal life goals, which may at times, lead to stress and anxiety (Garlow et al., 2008). In Nigeria, stressors are intensified by cultural factors like academic pressure and family responsibilities. These stressors particularly impact younger undergraduates, who often have lower coping capacities than their older counterparts. (Barker et al., 2020). It is therefore

reasonable to deduce that, when developmental challenges from age-related factors combine with rising academic demands, they may contribute to suicidal ideation among students. This underscores the importance of providing age-sensitive mental health support tailored to the young student population.

Gender also influences the prevalence and perceived experience of suicidal ideation among undergraduates, with male and female students often differing in their perceptions and responses to mental health challenges. Recent studies indicate that female students are more willing than male students to report suicide ideation, and to seek professional assistance. In contrast, male students are more likely to die from suicide, pointing towards another key area of untapped resiliencies and resource support (Schrijvers et al., 2012). More so, in the Nigerian culture, expectations of manliness and masculinity are very high, and even males are discouraged from seeking help hence, these dynamics are still more complicated (Canetto et al., 1998). On the other hand, female students experience special social challenges including conflicts between student and family responsibilities, which might lead to increased susceptibility to psychological problems (Abdalla, et al., 2017). These gender-specific factors only call for the development of postsecondary mental health interventions that adapt to the experiences of male and female undergraduates.

Barriers affecting Nigerian undergraduates include inadequate access to healthcare, overcrowded and substandard accommodation, and limited mental health services, all of which collectively diminish their health-related quality of life, (Okwaraji et al., 2014). Hawton et al. (2012) documented that student's perceived stress, coupled with the poor quality of life, forms a vicious cycle that deepens the students' mental health thus worsening suicidal intention. It is, therefore, important that in any in any comprehensive suicide prevention approach for this demographic, it is crucial to address quality of life indicators.

Mindfulness-Based Cognitive Therapy (MBCT) appears to be a promising intervention for targeting these variables as it focuses on the improvement of emotional regulation and cognitive control skills (Segal et al., 2002). MBCT integrates mindfulness practices with elements of cognitive behavioural therapy to assist people in overcoming the negative thinking patterns which usually arise due to stress and poor quality of life (Kuyken et al., 2015). Access to mental health care remains limited for many undergraduates in Nigeria, making Mindfulness-Based Cognitive Therapy (MBCT) a valuable alternative. MBCT meets the unique needs of students while promoting resilience and mental well-being. MBCT meets the unique needs of students while promoting resilience and mental well-being. It also offers an accessible approach that reduces the stigma often associated with mental health

services. In MBCT, various formal meditation practices are introduced where the individual pays attention to a particular focus in a non-striving and non-judgmental way. Whenever attention drifts off, the individual is invited to acknowledge this mind-wandering and gently reorient attention back to the previous focus (Rusadi et al., 2021). The practices encourage the individual to recognise when the doing mode is taking over and to engage in the being mode instead. Through practice, this approach increasingly allows one to identify the problematic deployment of the doing mode (i.e., driven-doing mode) in everyday life and to disengage from this purposefully in later stages of the programme (Manjaly et al., 2020).

From the review of literature, there seems to be a paucity of research exploring the effectiveness of mindfulness-based therapy on suicide ideation among Nigerian undergraduates (Ajibola et al., 2022). To the best of the knowledge of these researchers attempt has not been made toalso explore the structural equation modelling analysis of the relationship between mindfulness-based cognitive therapy and suicide ideation. This study, therefore, aimed at determining the extent to which Mindfulness-based cognitive therapy will reduce suicidal ideation among undergraduates as well as establish the mediating effects of age, gender and level of study on the relationship between mindfulness-based cognitive therapy and suicide ideation. It is, therefore, hypothesised that mindfulness-based cognitive therapy will not be significantly effective in reducing suicidal ideation among undergraduates at the pretest and posttest stages and age, gender and level of study are not significant mediators of the relationship between mindfulness-based cognitive therapy and suicide ideation.

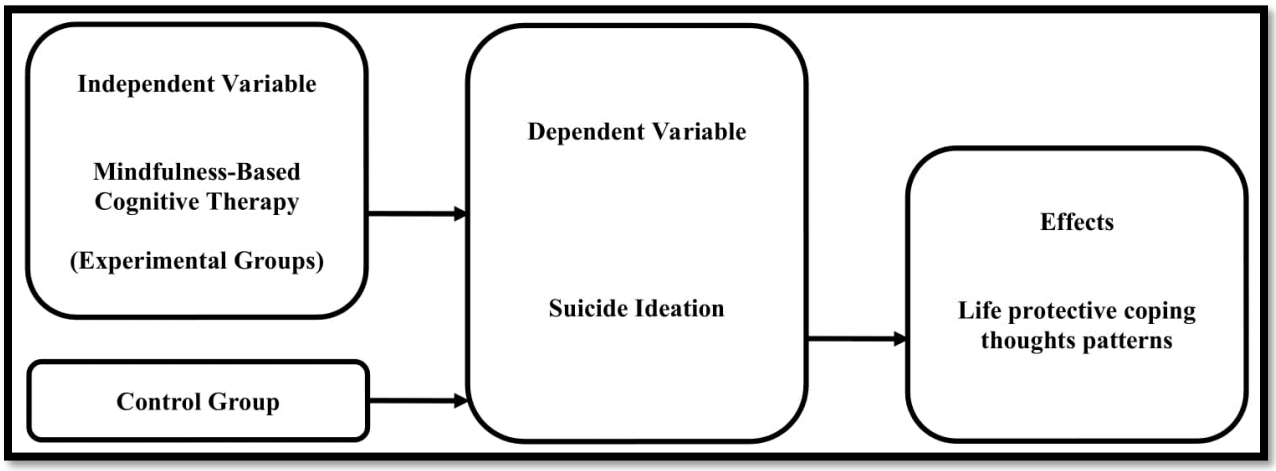

Fig 1 Model of the efficacy of Mindfulness-based Cognitive therapy on Suicide ideating Undergraduates

Figure 1 represent the conceptual model for the study. More specifically, figure 1 describes the efficacy of mindfulness-based cognitive therapy on suicide ideation of suicidal undergraduates in Nigeria. Mindfulness-Based Cognitive Therapy and suicide ideation represent the independent and dependent variables, respectively. Mindfulness-Based Cognitive Therapy as an intervention was administered to the experimental group, while the control group received no intervention. The possibility of the extraneous variables, which are not part of the independent variables affecting the results (of the dependent variable), was recognised. Extraneous variables were controlled through randomisation, as the undergraduate participants ranged from early, middle, and late adolescence to young adulthood.

Methods

Research Design

The pre-test and post-test experimental research design was adopted in this study. It can be described as a procedure in which the participants are selected for different conditions from pre-existing groups (Singh, 2021). The research instruments were administered to all the participants at two time periods: baseline (pre-test) and immediately after the interventions (post-test).

The study participants included 234 male and female undergraduate adolescents and young adults from Covenant University based on their high scores on the German Beck Scale for Suicide Ideation (BSS). A purposive sampling technique was used after the simple random method. The purposive sampling employed a set of non-probability sampling techniques, selecting participants based on specific characteristics required for the study.

German Beck Scale for Suicide Ideation scale (BSS)was used to assess suicide ideation. It was developed by Luxton, et al. (2011). It is a 10-item scale with sample items such as 'I have been thinking of ways to kill myself,' 'I believe my life will end in suicide,' and 'I have told someone I want to kill myself.' To test the construct validity of the suicide ideation scale, Luxton, et al. (2011) first examined the association between the suicide ideation total score and the BASIS-241 subscales. The results indicated that the Self-Harm subscale was significantly associated with the total SIS scorer (3072)¼.83, $p<.001$. The correlations between the suicide ideation total score and each of the other BASIS-241 sub-scales were as follows: Depression, .24, Relationships, .27, Emotional Lability, .30, Psychosis, .30, and Substance Abuse, .24 (all ps<.001). These results are consistent with previous evidence of construct validity for the suicide ideation scale (Rudd, 1989).

Results of the pilot study validation of the German Beck Scale for Suicide Ideation (BSS) showed that the scale has a Guttman split-half reliability coefficient of .910 and

a Spearman-Brown coefficient of .913 for equal and unequal length, respectively. The result showed that the scale has an internal consistency of .947 Cronbach's alpha. When item analysis was conducted, the result showed that all the items met up with Cristobal, et al. (2007) criterion for returning items on the scale, which stated that an item must correlate at least .30 with the total correlation. Based on these criteria, all the items were returned for use in the scale.
The scale is a 10-item scale, scored on a 5-point response format ranging from 1 = never, 2 = infrequently, 3 = sometimes, 4 = frequently, and 5 = always. It could be scored using its composite score or three subscales of suicidal desire, resolved plan/preparations, and commonality. The total BSS score can range from 0 to 38, with higher values indicating a greater risk of suicide.

Students were given the consent form to sign to indicate their willingness to participate in the study. The participants were also informed that if, for any reason, any of them decided to withdraw from the study, it would not affect their studies in any way, shape, or form. The two groups of students who agreed to be part of the intervention programme had a 90-minute each, weekly intervention for eight weeks at Psychology Lab 2nd floor of the CLDS Building.
To ensure that extraneous variables were controlled in this study the participants were randomly assigned to the treatment and control groups using simple random technique, specifically the ballot method. This was done to give each participant equal chance of being in the group and to eliminate the influence of unknown variables that could affect the outcome of the study. The participants were also matched by age, awareness and intelligence. They were all students within the institution (Covenant University) affected by the same routines predisposed by the university and/or environmental circumstances to ensure a balanced effect.
The standard eight-session MBCT treatment package was deployed for eight weeks for the intervention programme as training sessions for the experimental groups, which lasted for 60 minutes per session. In this period, the participants were exposed to Mindfulness-based cognitive therapy. Treatment modules covered audio, videos, lectures, discussions, and personal practice assignments. The researchers maintained a good rapport with the participants, which enhanced their openness, sincere response, and participation.

Ethical consideration

Ethical standards were upheld in undertaking this investigation. The consent of the Covenant University Ethical Review Board was acquired. Participation was very voluntary. Before the study was conducted the respondents received a detailed briefing and key information about the purpose of the study. Through an informed consent document, the respondents indicated their willingness to take part in the

study. To guarantee anonymity, secrecy, and avoidance of potential harm, all information was held and handled with the utmost confidentiality by not disclosing the names or any identifying information of any research participant.

Results

Mindfulness-based cognitive therapy does not have a significant effect on suicide Ideation of undergraduates at the pre-test and post-test stages.

Table 1: Test for difference in the level of suicide ideation between the experimental and control groups at the pre-test stage

Groups	N	Mean	SD	T	Df	Sig.
Experimental	117	2.98	0.774	-0.384	232	0.701
Control	117	3.01	0.687			

Table 1 shows that the experimental group's mean at pre-test is 2.98 (SD = 0.774), and the control group's mean score on the same scale is 3.01 (SD = 0.687). There is no statistically significant difference between the suicide ideation scores of the two groups (t = -0.384, p = 0.701).

Table 2: Test for difference in the level of suicide ideation between the experimental and control groups at the post-test stage

Groups	N	Mean	SD	T	Df	Sig.
Experimental	117	1.59	1.326	5.063	232	0.000
Control	117	2.30	0.734			

From Table 2, the mean of the experimental group at the post-test is 1.59 (SD = 1.326), and the mean score of the control group on the same scale is 2.30 (SD = 0.734). Also, a statistically significant difference exists between the suicide ideation scores of the two groups (t = 5.063, p = 0.000). This implies that participants who were exposed to mindfulness-based intervention had a reduction in their suicide ideation score, unlike those in the control group.

Table 3: Descriptive Statistics for experiment

Suicide Ideation Measure	Grouping Variable	Mean	Std. Deviation	N
Pre-test	Experiment	2.98	0.773	117
	Control	3.01	0.687	117
	Total	3.00	0.730	234
Post-test (log10)	Experiment	0.34	0.129	117
	Control	0.12	0.233	117
	Total	0.23	0.219	234

From Table 3 the mean score for suicide ideation for both the experiment and control group dropped in the post-test (second measurement) after the mindfulness-based intervention.

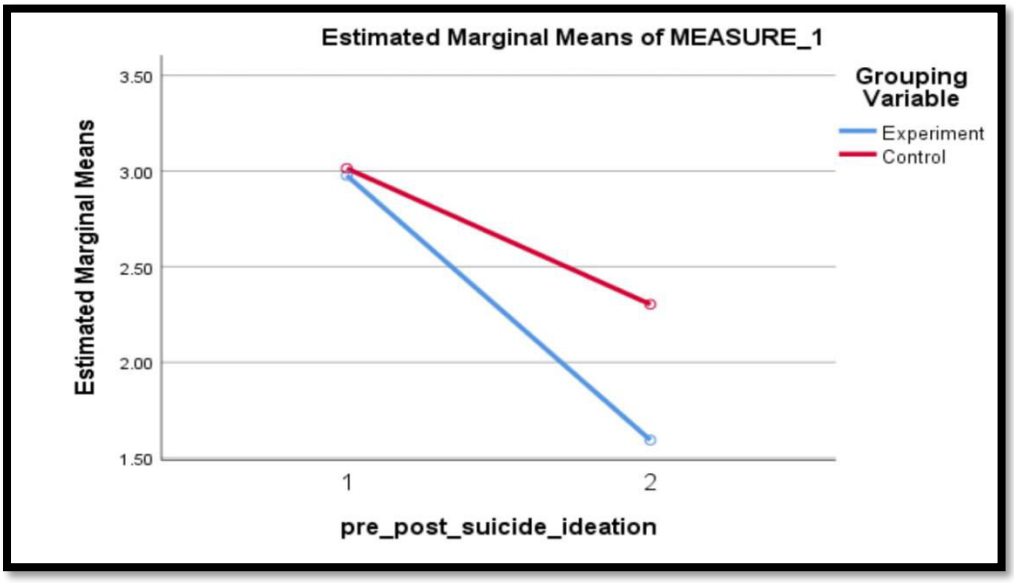

Fig. 2: Line chart of the pre-post suicide ideation by groups

The chart showed that there was a drop in the suicide ideation of both the experimental and control groups from the pre-test to the post-test. It went further to reveal that the drop was higher for the experimental group that had undergone mindfulness-based intervention compared to the control group which had no intervention. Fig. 2 showed that this is statistically significant ($p<0.05$) as seen in the split-plot ANOVA table, indicating that the mindfulness-based intervention was effective in reducing the suicide ideation of participants in the experimental group. This led to the rejection of the hypothesis which states that mindfulness-based cognitive therapy does not have a significant effect on suicide ideation of undergraduates at the pre-test and post-test stages.

Age, gender variables, and level of study are not significant mediators of the relationship between mindfulness-based care therapy and suicide ideation.

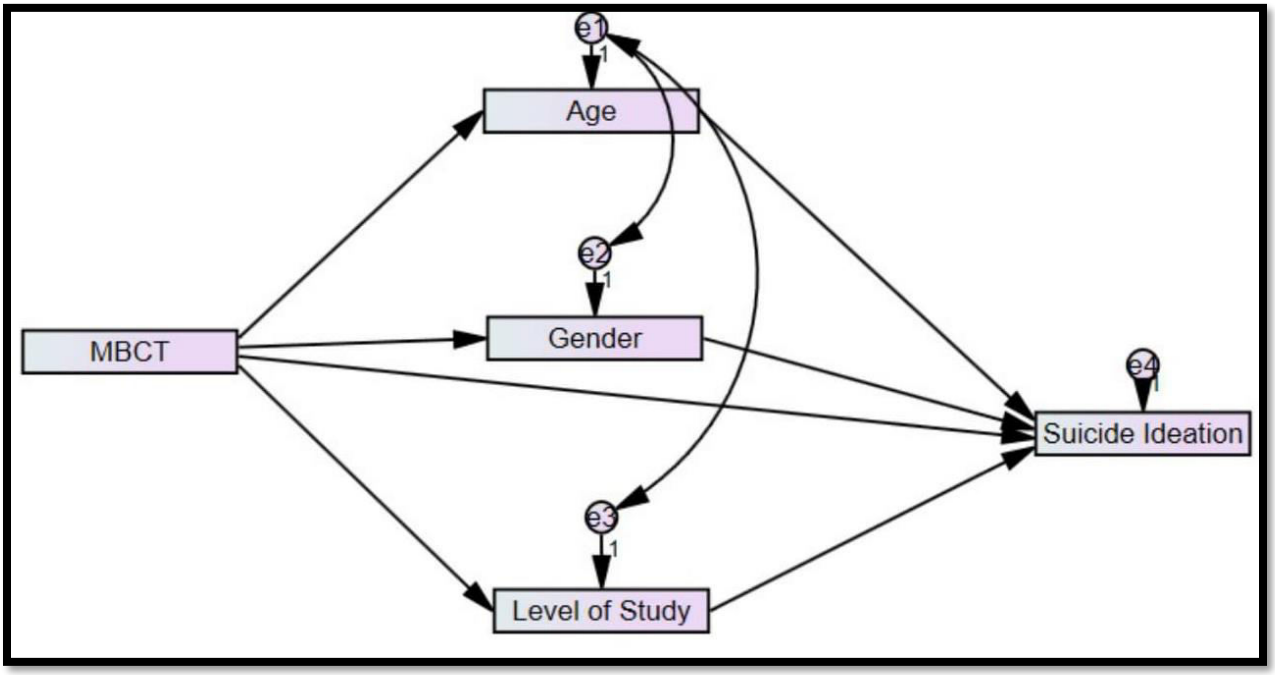

Fig. 3: Path diagram for the mediating effect of age, gender, and level of study on the relationship between mindfulness-based cognitive therapy and suicide ideation.

Table 4: Mediating analysis summary for the effect of age, gender, and level of study on the relationship between mindfulness-based cognitive therapy and suicide ideation.

Relationship	Direct without mediator	Direct with mediator	Indirect effect
MBCT, A: G:L, SI	-0.030 (0.563)	-0.021 (0.681)	NS (0.460)
MBCT, A, SI	-0.030 (0.563)	-0.021 (0.678)	NS (0.704)
MBCT, G, SI	-0.030 (0.563)	-0.021 (0.680)	NS (0.906)
MBCT, L, SI	-0.030 (0.563)	-0.021 (0.679)	NS (0.126)

Values are in estimates (p-value)

Keys

A - Age
G - Gender
L - Level of study
MBCT – Mindfulness-Based Cognitive Therapy
NS – Not Significant

The structural equation model (SEM) with AMOS was used to examine the mediating effect of age, gender, and level of study on the relationship between mindfulness-based care therapy and suicide ideation. From the Baron and Kenny (1986) method, there was no change in the influence of mindfulness-based care therapy on suicide ideation after the mediators (age, gender, and level of study) were controlled. This shows that there was no mediation path based on age, gender, or level of study on the effect of mindfulness-based cognitive therapy. It could also be seen that MBCT has a direct negative effect on suicide ideation, although it is not significant (B = -0.030, p-value = 0.563), i.e., an increase in MBCT results in a decrease in suicide ideation. The indirect effect of mindfulness-based care therapy on suicide ideation yielded a non-significant result (Table 4.9). Therefore, the hypothesis, which states that age, gender variables, and level of study are not significant mediators of the relationship between mindfulness-based cognitive therapy and suicide ideation, was accepted.

Discussion

Hypothesis one posits that Mindfulness-Based Cognitive Therapy (MBCT) does not have a significant effect on suicide ideation among undergraduates at both the pre-test and post-test stages. Mindfulness training was group-based, whereas the waiting list control condition was not. The hypothesis was tested with an independent (t) test for difference between the respondents in the pre-test and post-test groups, and participants who were exposed to the mindfulness-based intervention had a reduction in their suicide ideation score, unlike those in the control group. Therefore, the hypothesis was rejected.

The absence of reciprocal care is one key component of a sense of thwarted belongingness that may act as a motivational moderator or even as a direct predictor of increases in suicidal ideation. MBCT's mechanism of action may have accounted for the observed effects. One potentially important variable is peer support. Thus, MBCT delivered in groups may have reduced suicidal ideation by increasing the feeling of social belongingness of the participants. This could mean that any group-based intervention may have resulted in similar effects O'Connor, (2011). However, Tarrier et al. (2014) found even more significant effects for individuals than group-based cognitive-behavioural treatments. Thus, the medium-sized effect of MBCT on suicidality is unlikely to be attributable solely to the group setting, as this effect would not have been observed in just any therapeutic group.

This suggests that the specific components of MBCT play a distinct role in reducing suicidality beyond the general benefits of group therapy.Overall, the present research demonstrated that MBCT is a feasible and effective treatment for reducing suicide risk, showing a significant impact on reducing suicide ideation. While more research is needed to explore mindfulness-based interventions (MBIs) as a preventative tool for suicide risk, this study supports MBCT's potential in this area De Aguiar et al., (2021).

The structural equation model (SEM) with AMOS was used to examine the mediating effect of age, gender, and level of study on the relationship between mindfulness-based care therapy and suicide ideation for hypothesis two. From the Baron and Kenny (1986) method, there was no change in the influence of mindfulness-based care therapy on suicide ideation after the mediators (age, gender, and level of study) were controlled. This shows no mediation path based on age, gender, or level of study on the effect of mindfulness-based care therapy. It could also be seen that MBCT has a direct negative effect on suicide ideation. However, it is not significant, i.e., an increase in MBCT results in a decrease in suicide ideation. The indirect effect of mindfulness-based care therapy on suicide ideation yielded a non-significant result. Therefore, the hypothesis, which states that age, gender variables, and level of study are not significant mediators of the relationship between mindfulness-based care therapy and suicide ideation, was accepted.

Regarding the predictive factors of response to Mindfulness-Based Cognitive Therapy (MBCT) for patients with depressive symptoms, it has been noted that research on predictors of adherence to mindfulness practice remains limited, even in recent studies. This highlights a gap in understanding what factors contribute to sustained engagement and effectiveness of MBCT in managing depression. Notably, age appears to be the only sociodemographic factor that significantly influences participation in MBCT, with younger subjects more likely to drop out earlier from the programme compared to older participants. Crane et al., (2010). Furthermore, these sociodemographic data were consistent with those of extant studies conducted in the United States by Olano et al. (2015), which highlighted the fact that men were half as likely to engage in meditation programmes as women and that people with a high level of education were more frequently involved in such practices. One reason might be a greater tendency for women to introspect than men, as openness to one's feelings is perceived as feminine (Manon et al., 2022). Here, age and level of education have significant effects on mindfulness-based cognitive therapy (MBCT) in patients with depressive symptoms, though not mediating effects. However, generalising this to people with suicide ideation could be misleading. To the best of our knowledge, here is a lack of available data or studies examining the mediating effects of age, gender, or level of education on the relationship between Mindfulness-Based Cognitive Therapy (MBCT) and suicide ideation. This could be

because age, gender, or level of study does not have any significant or mediating effect on MBCT in suicide ideation, as supported by this current research findings. Further investigations are required for more encompassing knowledge about the mediating effect of age, gender, and level of study on MBCT about suicide ideation.

Implications of the Study

The study's findings hold significant implications for the management of mental health and application of mindfulness-based interventions in preventing and reducing suicide ideation among undergraduates. Incorporating mindfulness practices into mental health interventions reduces suicide ideation suggests its potential as a valuable tool in preventative and therapeutic interventions.

This study's results align with several previous investigations demonstrating the positive impact of Mindfulness-Based Cognitive Therapy on suicidal ideation in various populations, including adolescents, adults, and individuals with specific psychiatric diagnoses (e.g., depression, PTSD) (Fulton et al., 2016; Kuyken et al., 2015). While some studies report non-significant results, the overall body of research points towards the promise of MBCT as a complementary approach in suicide prevention programs.

These results are consistent with prior research highlighting the benefits of mindfulness interventions in reducing suicidal ideation. The agreement with existing data reinforces the notion that mindfulness-based approaches can be effective in addressing mental health concerns, particularly suicide ideation (Joiner, 2005; O'Connor et al., 2017).

The observed reduction in suicide ideation scores in the experimental group can be explained by the nature of mindfulness practices. Mindfulness encourages individuals to be present in the moment, fostering self-awareness and acceptance. This, in turn, may contribute to a decreased tendency for rumination and negative thought patterns associated with suicidal ideation (Chiesa et al., 2013).

Psychologically, mindfulness practices are linked to changes in brain function, including increased activity in areas associated with emotional regulation and decreased activity in regions linked to the default mode network, implicated in self-referential thoughts. These neural changes may underlie the observed reduction in suicide ideation (Davidson et al., 2003; Farb et al., 2010).

Conclusion

For suicidal behaviour to be diminished to a significant minimum, the predictors of suicide ideation should be addressed. Incorporating the predictors of suicide ideation into treatment and thoroughly evaluating them in individuals exhibiting suicide ideation would be a valuable approach for more effective intervention and care. This means that mindfulness-based cognitive therapy would yield better

results in the treatment of suicide ideation if the predictors triggering suicide ideation in individuals are identified and equally resolved during the treatment. Therefore, expertise in this modality of treatment must be developed and enhanced for optimum reduction in suicidal behaviour. Similarly, efforts should be made to enhance students' positive attitude towards therapeutic intervention if they are to come for professional assistance (Gesinde & Sanu, 2015).

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