

Attitudes Toward Exercise, Relaxation, and Sleep as Stress Management Strategies among University Undergraduates

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Abstract

Poorly managed stress can be detrimental to health. However, exercise, relaxation, and sleep are important strategies that can be adopted to manage stress and prevent its negative health consequences. This study investigated attitudes toward exercise, relaxation, and sleep as stress management strategies among undergraduates. A total of three hundred and fifty-five (355) undergraduates from the University of Nigeria participated in the cross-sectional study. The instrument used for data collection was a researcher-designed questionnaire developed based on reviewed related literature (Carver, 1997; Smith, 2002). The reliability of the instrument was confirmed with Cronbach's alpha coefficients of 0.8. The major findings showed that undergraduates of University of Nigeria Nsukka had a positive attitude (\bar{X} =3.43, SD =0.52) towards exercise (\bar{X} =0.72, SD =0.93), relaxation (\bar{X} =3.95, SD =0.55) and sleep (\bar{X} =3.47, SD =0.78) for managing stress. The results also revealed that there was no significant difference in the attitude towards exercise, relaxation and sleep based on gender (t =-1.487, P =0.138). Exercise (t =0.929, P =0.353), relaxation (t =-4.057, P =0.000) and sleep (t =-0.619, P =0.536), and age (t =1.115, P =0.326). Exercise (t =0.621, P =0.535), relaxation (t =1.414, P =0.158) and sleep (t =0.014, P =0.989). The study concluded that undergraduates have a positive attitude towards exercise, relaxation, and sleep as stress management strategies among university undergraduates. Furthermore, the study concluded that females showed more favourable attitudes toward relaxation as a stress management strategy compared to males.

Keywords: health, life-style behaviours, students, health beliefs, coping mechanisms

Introduction

University life is often characterised by high academic demands, social adjustments, and personal development challenges, all of which can lead to significant stress among students (Fentahun et al., 2025). Stress is a state of worry or mental tension caused by a difficult situation (World Health Organisation [WHO], 2023). Although stress is a normal part of life and can even be motivating in certain contexts (Robotham & Julian, 2006), high levels of stress pose a threat to health

(Cohen et al., 2019). As such, the importance of developing effective coping strategies for stress management among undergraduate students cannot be overstated. Among the many approaches to managing stress, lifestyle behaviours such as adequate sleep, relaxation techniques, and regular exercise are recognised as effective and sustainable strategies (American College Health Association [ACHA], 2020).

Exercise has been widely documented as a beneficial tool in stress reduction. Exercise is known to reduce levels of corti-

sol, the body's primary stress hormone, while stimulating the production of endorphins, neurotransmitters that improve mood and promote a sense of well-being (Salmon, 2001). Regular participation in moderate to vigorous exercise has been associated with lower levels of perceived stress among university students (Nguyen-Michel et al., 2006). However, the extent to which students perceive and utilise exercise as a stress management tool can be influenced by individual attitudes, awareness, and access to resources.

Furthermore, relaxation practices, including mindfulness, meditation, breathing techniques, and progressive muscle relaxation, are increasingly recognised as effective in reducing psychological distress and enhancing mental clarity (Grossman et al., 2004). These techniques work by activating the parasympathetic nervous system, which counters the body's stress response and helps induce a state of calm. Despite their documented benefits, relaxation strategies are often underutilised by students, possibly due to a lack of knowledge or perceived difficulty in maintaining consistency (de Vibe et al., 2013).

Sleep, an essential component of overall health, also plays a critical role in stress regulation (Lund et al., 2010). Poor sleep quality and insufficient sleep duration have been consistently linked with increased stress, anxiety, and depression in student populations (Lund et al., 2010). A good night's sleep helps regulate emotional reactivity and cognitive function, which are vital for managing academic and social pressures (Fentahun et al., 2025). Nevertheless, many students compromise sleep in favour of academic demands or social activities, thereby exacerbating stress levels.

Recent research (Fentahun et al., 2025; Liu et al. 2025) highlights the importance of health behaviours such as exercise, sleep, and relaxation in stress management among university students. A systematic review and meta-analysis (Liu et al., 2025) demonstrated that physical exercise interventions significantly improve university students' mental health outcomes, including reductions in stress, anxiety, and depression, while enhancing wellbeing and sleep quality; aerobics, resistance, and high-intensity exercises showed notable benefits when performed regularly over extended periods. Another Chinese cross-sectional study (Xu et al., 2025) found that higher levels of physical activity were associated with better sleep quality among university students, mediated by reductions in rumination and depression, suggesting that exercise helps regulate psychological processes that contribute to sleep disturbances in stressed students. Furthermore, recent work has identified significant associations between students' well-being, sleep patterns, sport participation, and perceived stress, with better sleep and higher physical activity levels linked to improved well-being and lower stress.

Rationale of the study

Despite growing evidence that physical exercise and relaxation practices can mitigate stress and improve sleep quality in university populations, few studies concurrently assess students' attitudes toward these stress management strategies alongside self-reported use and perceived effectiveness. Most existing work focuses on behavioural outcomes or intervention effects rather than on attitudinal constructs such as the

value students place on exercise, relaxation, and sleep for coping with stress. Additionally, research tends to examine these coping mechanisms in isolation rather than as an integrated set of stress management strategies.

In Nigeria, stress among university students is a growing concern, particularly as institutional and societal pressures mount. A study by Eze and Eze (2016) found that many Nigerian undergraduates experience high levels of stress due to academic workloads, financial concerns, and future uncertainties. However, little research has specifically examined how Nigerian students perceive and engage in health-promoting behaviours like exercise, relaxation, and sleep for managing stress. Understanding these attitudes is essential for developing targeted interventions to promote holistic well-being among students.

This study, therefore, investigated the attitudes of undergraduate students at the University of Nigeria, Nsukka, toward exercise, relaxation, and sleep as strategies for managing stress based on demographic variables of age, gender and marital status. We hypothesised that there is no significant difference in attitudes towards exercise, relaxation and sleep as stress management strategies based on gender, age and marital status.

Methods

Study design and setting

A cross-sectional study was conducted between May and July 2024 at the University of Nigeria, Nsukka, a large federal public university located in Enugu State, southeastern Nigeria. The university hosts a diverse undergraduate population drawn from various academic disciplines, making it an appropriate setting for examining stress management attitudes among undergraduates.

Participants

The participants comprised undergraduates from different academic departments. The participants were undergraduate students drawn from various academic departments. The sample comprised 181 males and 174 females. With respect to age distribution, 303 participants were aged 16–24 years, while 52 participants were aged 25–34 years. Participants were adequately informed about the aims and procedures of the study, and written informed consent was obtained from all participants before data collection.

Sampling strategy

A sample size of 355 respondents participated in the study. A multistage sampling technique was used in this study. In the first stage, simple random sampling (balloting without replacement) was used to select seven faculties from the nine faculties at the University of Nigeria, Nsukka. In the second stage, three departments were randomly selected from each of the seven selected faculties, also using simple random sampling by balloting without replacement, resulting in a total of 21 departments. In the third stage, 18 undergraduate students were recruited from each of the 21 selected departments us-

ing a convenience sampling technique, based on availability and willingness to participate. This procedure yielded a total of 378 undergraduates. After data collection and cleaning, 355 questionnaires, which represent 94 per cent of the sample, were duly completed and therefore used for analysis.

Measures

Data was collected using a researcher-designed questionnaire developed based on information from reviewed related literature (Carver, 1997; Smith, 2002). The questionnaire was made up of four sections. Section A contained three (3) items which elicited information on the socio-demographic variables (age, gender and marital status). Section B consisted of five (5) items, which sought information on the attitude towards exercise. Section C consisted of seven (7) items, which sought information on the attitude towards relaxation. Section D consisted of four (4) items, which sought information on the attitude towards sleep. The questions were assigned a four-point Likert response format of Strongly Agreed (4 points), 'Agree (3 points)', 'Disagree (2 points)', and 'Strongly Disagree (1 point)' (Boone & Boone, 2012). Mean and standard deviation were used for analysing the Likert scale questions, which measured attitude. Mean scores from 2.5 and above were rated as a positive attitude, while a score below 2.5 was rated as a negative attitude.

To examine the face and content validity, the questionnaire was given to a professional board of five experts on the subject (medical and public health sciences, human kinetics and sports studies) and an expert in methodology. After collecting the opinions of these experts, possible modifications were made.

To determine the reliability of the questionnaire, Cronbach's alpha was adopted. This yielded a score of 0.82. The cut-off point for the calculations was 0.70.

Data collection procedure

This study was approved by the Research Ethics Committee of the Faculty of Education, University of Nigeria, Nsukka (Ethical Clearance Code; UNN/FE/REC24/092), and was conducted in compliance with the Ethical Principles of the World Medical Association Declaration of Helsinki for medical research involving human subjects (World Medical Association, 2013).

To facilitate data collection, the research team met with the Heads of Departments of the several departments selected for the study to ask for their consent to study their subjects to secure the respondents' cooperation. Following agreement with the department Heads, the students gave their informed consent verbally after being briefed on the procedure and timing of the data collection. Additionally, the research team informed the participants of the study's goals and gave them assurances regarding the confidentiality of their personal information.

Ten research assistants aided in the data collection. These assistants were undergraduate students from various departments at the University of Nigeria, Nsukka—an approach intended to encourage cooperation from the respondents. A total of 378 questionnaires were distributed to the respondents by the researcher and the assistants. However, 355 had complete data and were included in the subsequent analyses.

Data analysis

Data were analysed using the Statistical Package for the Social Sciences (SPSS, Version 25; IBM Corp., Armonk, NY, USA).

The null hypotheses were tested using an independent t-test and One-way ANOVA. The Independent T test was used to compare male and female attitudes towards exercise, relaxation and sleep as stress management. The Independent T test was also used to compare attitudes based on age. While One-way ANOVA was used to compare singles, married and separated participants' attitudes towards exercise, relaxation and sleep as stress management. The entire null hypotheses were tested at a 0.05 level of significance. All tests were 2-tailed, and probability values less than or equal to 0.05 ($p \leq 0.05$) were considered significant. We also conducted Scheffe Post Hoc Analysis of Group Mean Difference to compare the mean difference between single, married and separated undergraduates and their attitude towards using sleep as a stress coping strategy.

Results

The undergraduates reported an overall positive attitude toward exercise, relaxation, and sleep as stress management strategies ($\bar{X}=3.43$, $SD=0.52$). Specifically, attitudes toward exercise were moderate ($\bar{X}=2.72$, $SD=0.93$), while attitudes toward relaxation ($\bar{X}=3.95$, $SD=0.55$) and sleep ($\bar{X}=3.47$, $SD=0.78$) were more positive (Table 1).

Table 1. Attitude towards exercise, relaxation and sleep as stress management among undergraduates of University of Nigeria Nsukka (n=355)

S/N	Items	M	SD	Decision
Exercise				
1	Whenever I feel stressed out, I mostly exercise	2.69	1.33	PA
2	Engaging in weightlifting to get relief from stress	2.38	1.21	NA
3	Participating in outdoor games when I feel stressed or anxious	3.16	1.32	PA
4	Swimming so as to manage stress	2.65	1.29	PA
5	Cycling to get relief when confronted with a stressful situation	2.72	1.24	PA

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Table 1. Attitude towards exercise, relaxation and sleep as stress management among undergraduates of University of Nigeria Nsukka (n=355)

S/N	Items	M	SD	Decision
Relaxation				
6	Taking a deep breath whenever I'm under pressure	4.41	0.78	PA
7	Isolating into a peaceful state when feeling threatened	4.23	0.92	PA
8	Having a warm bath is stress relieving for me	3.87	1.10	PA
9	Casting my mind on a pleasant event when stressed	3.92	1.08	PA
10	Meditating whenever I experience stress	3.63	1.09	PA
11	Getting a massage when stressed	3.23	1.24	PA
12	Listening to music when stressed	4.34	0.92	PA
Sleep				
13	Sleeping often whenever stressed or anxious	4.13	1.10	PA
14	Sleeping more when nervous or under pressure	3.48	1.28	PA
15	Staying awake all night thinking about stressful events	2.76	1.36	PA
16	Sleeping up to eight hours is stress relieving	3.52	1.38	PA
Overall Attitude		3.43	0.52	PA

Positive attitude towards exercise, relaxation and sleep for managing stress = $\bar{X} > 2.50$
 Negative attitude towards exercise, relaxation and sleep for managing stress = $\bar{X} < 2.50$

There was no significant difference in attitudes toward exercise ($t = -1.487, p = 0.138$) and sleep ($t = -1.487, p = 0.138$) based on gender, although male students scored slightly higher than female students in both cases. In contrast, there

was a significant difference in attitudes toward relaxation based on gender ($t = -4.057, p < 0.001$), with male students showing more positive attitudes toward relaxation than female students (Table 2).

Table 2. Summary of t-test analysis showing the difference in attitude towards exercise, relaxation and sleep as Stress Management among Undergraduates of University of Nigeria, Nsukka Enugu State based on Gender (n=355)

Variable	Male		Female		t	p	Cohen's d
	Mean	SD	Mean	SD			
Exercise	2.77	0.94	2.67	0.93	0.929	0.353	0.11
Relaxation	3.83	0.58	4.06	0.50	-4.057	0.000	-0.43
Sleep	3.45	0.75	3.50	0.80	-0.619	0.536	-0.06
Overall Attitude	3.39	0.53	3.48	0.51	-1.487	0.138	-0.17

Note. NS = Not Significant; S = Significant; SE = Standard Error; CI = Confidence Interval

Regarding age, there were no significant differences in attitudes toward exercise, relaxation, or sleep ($t = 1.115, p = 0.326$), though students aged 16–24 years had slightly

higher mean scores for exercise and sleep than those aged 25–34 years (Table 3).

Table 3. Summary of t-test analysis showing the difference in attitude towards Exercise, Relaxation and Sleep as stress management among Undergraduates of University of Nigeria, Nsukka Enugu State based on age (n=355)

Variable	Younger (16–24 y)		Older (25–34 y)		t	p	Cohen's d
	Mean	SD	Mean	SD			
Exercise	2.73	0.93	2.65	0.99	0.621	0.535	0.08
Relaxation	3.96	0.57	3.85	0.45	1.414	0.153	0.21
Sleep	3.47	0.76	3.47	0.88	0.014	0.989	0.00
Overall Attitude	3.45	0.53	3.37	0.49	0.984	0.326	0.16

Note. NS = Not Significant; SE = Standard Error; CI = Confidence Interval

Analysis by marital status indicated no significant differences in attitudes toward exercise ($F=1.556$, $p=0.212$) and relaxation ($F=1.556$, $p=0.212$). However, there was a significant difference in attitudes toward sleep as a stress manage-

ment strategy ($F=4.279$, $p=0.015$), with married students reporting the most positive attitudes, followed by separated students, and single students reporting the least positive attitudes (Table 4).

Table 4. One-way ANOVA testing the difference in attitude towards exercise, relaxation and sleep as stress management among undergraduates of University of Nigeria, Nsukka based on marital status (n=355)

Variable	Married		Separated		Single		F	p	Post-hoc
	Mean	SD	Mean	SD	Mean	SD			
Exercise	3.20	0.98	2.63	0.83	2.70	0.93	1.802	0.167	NS
Relaxation	3.84	0.66	4.14	0.45	3.95	0.55	0.641	0.527	NS
Sleep	3.46	0.76	3.04	1.22	3.46	0.76	4.279	0.015	NS
Overall Attitude	3.43	0.52	3.38	0.60	3.43	0.52	1.556	0.212	NS

Note. NS = Not Significant; S = Significant at $p<0.05$

Post hoc comparisons confirmed that single students had significantly lower mean scores for sleep compared with married students, whereas married students had significantly

more positive attitudes than separated students. There was no significant difference between single and separated students in their attitudes toward sleep (Table 5).

Table 5. Scheffe Post Hoc analysis of group mean difference based on attitude towards exercise, relaxation and sleep as stress management among undergraduates of University of Nigeria, Nsukka (n=355)

(I) Marital	(J) Marital	Mean Difference (I–J)	SE	p	95% CI Lower	95% CI Upper
Single	Married	-0.560	0.217	0.037	-1.094	-0.259
Single	Separated	0.417	0.317	0.420	-0.361	1.196
Married	Single	0.560	0.217	0.037	0.026	1.094
Married	Separated	0.978	0.379	0.037	0.045	1.910
Separated	Single	-0.417	0.317	0.420	-1.196	0.361
Separated	Married	-0.978	0.379	0.037	-1.910	-0.045

The mean difference is significant at the 0.05 level

Discussion

The findings of our study indicate that undergraduates at the University of Nigeria, Nsukka, generally hold positive attitudes toward exercise, relaxation, and sleep as strategies

for managing stress ($\bar{X}=3.43$, $SD=0.52$). Among the three strategies, attitudes toward relaxation were the most positive ($\bar{X}=3.95$, $SD=0.55$), followed by sleep ($\bar{X}=3.47$, $SD=0.78$), while attitudes toward exercise were moderate ($\bar{X}=2.72$, $SD=0.93$). These findings suggest that students may prefer

stress management strategies that are immediately accessible, require less physical exertion, and can be integrated easily into daily routines.

The high preference for relaxation techniques aligns with previous research (Sharma et al., 2015) indicating that strategies such as deep breathing, mindfulness, and leisure activities are widely accepted among university students due to their calming effects and ease of practice (Sharma et al., 2015). Relaxation can reduce sympathetic nervous system activity, lower cortisol levels, and enhance emotional regulation, providing immediate stress relief (Khoury et al., 2015; Tang et al., 2007). The moderately high rating for sleep found in our study is consistent with literature emphasizing its role in psychological recovery, cognitive functioning, and emotional regulation (Pilcher & Huffcutt, 1996; Walker, 2017). Adequate sleep has been shown to improve attention, mood, and resilience to stress, which may explain why students recognize it as an effective coping strategy.

Conversely, exercise received the lowest mean score, indicating a relatively less positive attitude toward physical activity for stress management. This contrasts with abundant evidence demonstrating the benefits of exercise for reducing stress, anxiety, and depressive symptoms (Biddle & Asare, 2011; Salmon, 2001; Sharma et al., 2006). The lower enthusiasm for exercise in this sample may reflect perceived barriers such as time constraints, physical fatigue, or lack of accessible facilities (Saxena et al., 2015). Cultural and environmental factors, including academic workload and campus infrastructure, may also influence students' willingness to engage in physical activity as a coping mechanism.

Regarding gender differences, our study found no significant differences in attitudes toward exercise and sleep. However, there was a significant difference in attitudes toward relaxation, with male students demonstrating more positive attitudes than female students. Interestingly, this contrasts with some studies suggesting that females are generally more likely to engage in psychological coping strategies, including relaxation and social support (Matud, 2004; Tamres et al., 2002). This discrepancy could be explained by cultural or contextual factors specific to the study population, such as gendered perceptions of stress management or differential exposure to relaxation-promoting activities. It may also reflect variations in stressor types experienced by male and female students, with males potentially adopting relaxation techniques more actively to cope with academic or social pressures.

Age did not significantly influence attitudes toward any of the stress management strategies. This finding suggests that within the undergraduate population, stress-coping attitudes may be relatively stable across the typical age range of 16–34 years. This aligns with previous research by Eze and Eze (2016) indicating that coping preferences in young adults are more strongly influenced by individual personality traits, situational demands, and perceived efficacy of strategies rather than chronological age (Eze & Eze, 2016; Folkman & Moskowitz, 2004).

Marital status significantly influenced attitudes toward sleep, with married students reporting the most positive attitudes, followed by separated students, and single students

reporting the least positive attitudes. This may be due to structured routines and shared responsibilities in married life, which encourage regular sleep patterns and reinforce the value of restorative behaviors (Troxel et al., 2007). In contrast, single students may experience more irregular schedules or heightened academic and social stress, reducing attention to sleep as a coping mechanism. Separated students' lower scores may reflect relational stress or emotional instability impacting sleep quality (Meijer, 2008; Troxel et al., 2007).

The findings of this study may also be influenced by environmental and cultural factors specific to the Nigerian context. For instance, high academic workload, limited recreational facilities, and cultural norms surrounding exercise and leisure may shape students' attitudes toward various coping strategies. The preference for relaxation and sleep over exercise may also be related to perceived convenience, immediate effectiveness, and personal enjoyment, which are known to predict engagement in coping behaviors (Schunk & DiBeneditto, 2020).

Our study has several strengths, including its broad focus on multiple stress management strategies, the inclusion of demographic comparisons, and the use of a large, diverse undergraduate sample, enhancing the reliability of its findings. However, limitations include the use of self-reported data, which may be subject to social desirability bias, the single-institution sample, limiting generalizability, and the cross-sectional design, which precludes causal inference. Future research should consider longitudinal or multi-institutional designs, as well as qualitative methods to explore underlying motivations and barriers influencing students' attitudes. Intervention-based studies could further promote positive coping strategies, particularly in areas where attitudes toward certain strategies, such as exercise, are less favourable.

Conclusion

Overall, the results of this study suggest that undergraduates at the University of Nigeria, Nsukka, hold generally positive attitudes toward exercise, relaxation, and sleep as effective strategies for managing stress. However, notable variations exist based on demographic factors, particularly gender and marital status, with females showing more favourable attitudes toward relaxation, and married students demonstrating more positive attitudes toward sleep compared to their single or separated peers. These findings highlight the importance of understanding how personal characteristics influence coping preferences, which can inform the development of more targeted and effective stress management interventions. To enhance their impact, such interventions should be accessible and tailored to address the unique needs of different student groups. By promoting balanced and sustainable coping strategies across diverse populations, universities can play a critical role in improving students' mental health, academic performance, and overall well-being.

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Conflict of interest

The authors have declared no competing or conflicting interests.

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References

- American College Health Association. (2020). *National College Health Assessment III: Undergraduate student reference group executive summary spring 2020*. https://www.acha.org/documents/ncha/NCHA-III_SPRING_2020_UNDERGRADUATE_REFERENCE_GROUP_EXECUTIVE_SUMMARY.pdf
- Bayram, N., & Bilgel, N. (2008). The prevalence and socio-demographic correlations of depression, anxiety and stress among a group of university students. *Social Psychiatry and Psychiatric Epidemiology*, 43(8), 667–672. <https://doi.org/10.1007/s00127-008-0345-x>
- Biddle, S. J. H., & Asare, M. (2011). Physical activity and mental health in children and adolescents: A review of reviews. *British Journal of Sports Medicine*, 45(11), 886–895. <https://doi.org/10.1136/bjsports-2011-090185>
- Boone, H. N., Jr., & Boone, D. A. (2012). Analyzing Likert data. *Journal of Extension*, 50(2), 1–5.
- Cohen, S., Gianaros, P. J., & Manuck, S. B. (2019). A stage model of stress and disease. *Perspectives on Psychological Science*, 11(4), 456–463. <https://doi.org/10.1177/1745691616646305>
- Deckro, G. R., Ballinger, K. M., Hoyt, M., Wilcher, M., Dusek, J., Myers, P., . . . & Benson, H. (2002). The evaluation of a mind/body intervention to reduce psychological distress and perceived stress in college students. *Journal of American College Health*, 50(6), 281–287. <https://doi.org/10.1080/07448480209596346>
- de Vibe, M., Bjørndal, A., Tipton, E., Hammerstrøm, K., & Kowalski, K. (2013). Mindfulness based stress reduction (MBSR) for improving health, quality of life and social functioning in adults. *Campbell Systematic Reviews*, 9(1), 1–127. <https://doi.org/10.4073/csr.2013.3>
- Eicher, V., Staerklé, C., & Clémence, A. (2014). I need a degree! The role of goal importance in predicting a academic cheating. *Journal of Experimental Education*, 82(4), 518–536. <https://doi.org/10.1080/00220973.2013.876224>
- Eze, J. U., & Eze, P. U. (2016). Stress management strategies among students of tertiary institutions in Nigeria. *International Journal of Education and Research*, 4(1), 171–186. <http://www.ijern.com/journal/2016/January-2016/15.pdf>
- Fentahun, S., Rtbey, G., Nakie, G., Andualem, F., Tinsae, T., Kibralew, G., . . . & Tadesse, G. (2025). Burden of perceived stress among university students in Africa: a systematic review and meta-analysis. *BMC Public Health*, 25(1), 2248. <https://doi.org/10.1186/s12889-025-23533-2>
- Folkman, S., & Lazarus, R. S. (1985). If it changes it must be a process: Study of emotion and coping during three stages of a college examination. *Journal of Personality and Social Psychology*, 48(1), 150–170. <https://doi.org/10.1037/0022-3514.48.1.150>
- Grossman, P., Niemann, L., Schmidt, S., & Walach, H. (2004). Mindfulness-based stress reduction and health benefits. *Journal of Psychosomatic Research*, 57(1), 35–43. [https://doi.org/10.1016/S0022-3999\(03\)00573-7](https://doi.org/10.1016/S0022-3999(03)00573-7)
- Khoury, B., Sharma, M., Rush, S. E., & Fournier, C. (2015). Mindfulness based stress reduction for healthy individuals: A meta analysis. *Journal of Psychosomatic Research*, 78, 519–528.
- Liu, L., Xin, X., Wang, H., & Zhang, Y. (2025). Effectiveness of physical exercise on mental health among university students: a systematic review and meta-analysis. *Frontiers in Psychology*, 16, 1612408. doi: 10.3389/fpsyg.2025.1612408
- Lund, H. G., Reider, B. D., Whiting, A. B., & Prichard, J. R. (2010). Sleep patterns and predictors of disturbed sleep in a large population of college students. *Journal of Adolescent Health*, 46(2), 124–132. <https://doi.org/10.1016/j.jadohealth.2009.06.016>
- Matud, M. P. (2004). Gender differences in stress and coping styles. *Personality and Individual Differences*, 37(7), 1401–1415. <https://doi.org/10.1016/j.paid.2004.01.010>
- Meijer, A. M. (2008). Chronic sleep reduction, functioning at school and school achievement in preadolescents. *Journal of Sleep Research*, 17(4), 395–405. <https://doi.org/10.1111/j.1365-2869.2008.00663.x>
- Misra, R., & McKean, M. (2000). College students' academic stress and its relation to their anxiety, time management, and leisure satisfaction. *American Journal of Health Studies*, 16(1), 41–51.
- Nguyen-Michel, S. T., Unger, J. B., Hamilton, J., & Spruijt-Metz, D. (2006). Associations between physical activity and perceived stress/hassles in college students. *Stress and Health*, 22(3), 179–188. <https://doi.org/10.1002/smi.1094>
- Porges, S. W. (2011). *The polyvagal theory: Neurophysiological foundations of emotions, attachment, communication, and self-regulation*. W. W. Norton & Company.
- Pilcher, J. J., & Huffcutt, A. I. (1996). Effects of sleep deprivation on performance: A meta analysis. *Sleep*, 19(4), 318–326.
- Ptacek, J. T., Smith, R. E., & Zanas, J. (1994). Gender, appraisal, and coping: A longitudinal analysis. *Journal of Personality*, 62(4), 593–625. <https://doi.org/10.1111/j.1467-6494.1994.tb00302.x>
- Robotham, D., & Julian, C. (2006). Stress and the higher education student: A critical review of the literature. *Journal of Further and Higher Education*, 30(2), 107–117. <https://doi.org/10.1080/03098770600617513>
- Salmon, P. (2001). Effects of physical exercise on anxiety, depression, and sensitivity to stress: A unifying theory. *Clinical Psychology Review*, 21(1), 33–61. [https://doi.org/10.1016/S0272-7358\(99\)00032-X](https://doi.org/10.1016/S0272-7358(99)00032-X)
- Schunk, D. H., & DiBenedetto, M. K. (2020). Motivation and social cognitive theory. *Contemporary Educational Psychology*, 60, 101832.
- Sharma, A., Madaan, V., & Petty, F. D. (2006). Exercise for mental health. *Primary Care Companion to the Journal of Clinical Psychiatry*, 8(2), 106. <https://doi.org/10.4088/pcc.v08n0208a>
- Singh, R., Goyal, M., & Tiwari, S. (2019). Role of exercise and yoga in stress management. *International Journal of Science and Research*, 8(6), 1025–1029.
- Tang, Y. Y., Ma, Y., Wang, J., Fan, Y., Feng, S., Lu, Q., . . . Posner, M. I. (2007). Short term meditation training improves attention and self regulation. *Proceedings of the National Academy of Sciences*, 104(43), 17152–17156.
- Troxel, W. M., Robles, T. F., Hall, M., & Buysse, D. J. (2007). Marital quality and the marital bed: Examining the covariation between relationship quality and sleep. *Sleep Medicine Reviews*, 11(5), 389–404. <https://doi.org/10.1016/j.smr.2007.05.002>
- University of Nigeria, Nsukka Information Communication Technology Center. (2023). *Student population report 2023/2024 academic session*. UNN.
- Walker, M. (2017). *Why we sleep: Unlocking the power of sleep and dreams*. Scribner.
- World Health Organization. (2023). *Stress*. <https://www.who.int/news-room/questions-and-answers/item/stress>
- World Medical Association. (2013). *Declaration of Helsinki: Ethical principles for medical research involving human subjects*. <https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/>
- Xu, L., Yan, W., Hua, G. et al. (2025). Effects of physical activity on sleep quality among university students: chain mediation between rumination and depression levels. *BMC Psychiatry* 25, 7. <https://doi.org/10.1186/s12888-024-06450-3>