The Moderating Role of Emotion Regulation in the Relationship between Trauma Exposure, Diet and Sleep Quality among Adults in Uyo Metropolis

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ABSTRACT

Trauma exposure, poor diet, and low sleep quality are interconnected challenges with significant health implications, yet limited attention has been given to the moderating role of emotion regulation in these relationships. This study explored the moderating role of emotion regulation in the relationship between trauma exposure, diet, and sleep quality among adults in Uyo Metropolis, Nigeria. A total of 300 participants (172 males, 128 females), aged 18–39 years (M = 23.8), were purposively selected. They completed the Emotion Regulation Questionnaire (ERQ), Trauma History Questionnaire (THQ), Diet and Behavior Scale (DABS), and Sleep Quality Scale (SQS). Data were analyzed using the Hayes regression-based PROCESS macro and Pearson's r statistic. Results revealed that trauma exposure was negatively associated with sleep quality, while diet and emotion regulation were positively associated with sleep quality. Additionally, emotion regulation moderated the relationship of trauma exposure, diet and sleep quality. These findings reveal the critical role of emotion regulation in mitigating the negative effects of trauma and poor dietary habits on sleep quality. Practical implications are discussed, highlighting the need for targeted interventions to improve sleep quality and overall well-being.

Key Words: Emotion Regulation, Trauma Exposure, Diet and Sleep Quality.

INTRODUCTION

In recent years, researchers have shown an increasing interest in the intricate relationships between trauma exposure, dietary patterns, and sleep quality, especially given the profound impact these factors have on overall health and well-being (Smith et al., 2019; Johnson & Williams, 2020; Patel, 2021). Sleep quality, a critical determinant of physical and mental health, is characterized by both subjective and objective aspects, such as ease of falling asleep, total sleep duration, frequency of nighttime awakenings, and the sense of restfulness upon waking. Poor sleep quality, which can manifest as difficulties with falling asleep, frequent awakenings, or non-restorative sleep, is associated with numerous adverse health outcomes, including impaired cognitive function, emotional instability, and heightened risk of chronic conditions (Brown et al., 2018; Miller & Carter, 2019). Despite a substantial body of research highlighting the detrimental effects of insufficient sleep, many people fail to meet the recommended seven to nine hours of nightly rest (Chattu et al., 2019; Hafner et al., 2017; Sheehan et al., 2019). For instance, a recent survey conducted in the UK revealed that 74% of respondents were sleeping less than seven hours per night (The Sleep Council, 2017). Sleep deprivation and poor sleep quality have become so widespread in both developed and developing countries that experts in the field now describe the issue as a global health crisis (Chattu et al., 2019; Stranges et al., 2012).

Existing research has highlighted links between trauma exposure and poor sleep quality (Brindle et al., 2018; Zhang et al., 2020) as well as between diet and sleep quality (St-Onge, Mikic, & Pietrolungo, 2016; Binks et al., 2020; Godos et al., 2021; Ramón-Arbués et al., 2022). Additionally, recent studies have reported that higher levels of positive psychological attributes—such as mindfulness, self-compassion, gratitude, and optimism—are associated with better sleep outcomes (Alkozei et al., 2019; Brown et al., 2021; Hernandez et al., 2020; Sala et al., 2020; Jessop, Tout, & Miles, 2023; Tout, Jessop, & Miles, 2024). However, research examining how emotional regulation may moderate the relationship between trauma exposure, dietary habits, and sleep quality among adults remains limited. Hence, addressing the moderating role of emotional regulation on the relationship of trauma exposure, diet and sleep quality among adults in Uyo Metropolis, Akwa Ibom State, is essential for developing targeted interventions aimed at improving well-being.

Exposure to trauma has been related to adverse behavioral, mental, and health outcomes later in life including poor sleep quality (Pickett, Barbaro & Mello, 2016; Brindle et al., 2018). Trauma exposure involve experiences of distressing or potentially harmful events, often leaves lasting impacts on an individual's emotional and physiological state, influencing both dietary behaviors and sleep quality (Brezo et al., 2021; Patel et al., 2021). This exposure can disrupt emotional processes, leading to maladaptive coping strategies such as emotional eating or dietary restriction, which may, in turn, exacerbate poor sleep quality (Zang et al., 2020). In Nigeria, particularly in regions like Uyo, trauma exposure remains prevalent, with community violence, political unrest, and economic challenges contributing to these experiences (Federal Ministry of Health, 2018). Investigating how trauma exposure impacts health outcomes in this population can shed light on the unique challenges faced by individuals in this context.

Over the years, research has shown that diet, as a modifiable lifestyle factor, can significantly influence sleep patterns. From a macronutrient perspective, excessive consumption of saturated fats and sugars, combined with low fiber intake, has been linked to less restorative sleep (Malik et al., 2015; St-Onge, 2016). Similarly, insufficient intake of proteins and carbohydrates may result in shorter sleep duration (Grandner et al., 2013). On the other hand, certain foods appear to have a positive impact on sleep. For instance, consuming bread, legumes, fatty fish, and shellfish has been associated with longer sleep duration (Komada et al., 2017). Additionally, foods such as nuts (Mossavar-Rahmani, 2017), dairy products (Yasuda et al., 2019; Komada, Okajima, & Kuwata, 2020), and fruits like cherries and kiwis (Doherty et al., 2019) may also promote better sleep. Studying dietary patterns among adults can offer insights into how diet interacts with trauma exposure to impact health outcomes, with potential implications for public health strategies focused on improving nutrition and sleep hygiene.

Emotion regulation, defined as the ability to effectively manage and respond to emotional experiences, has emerged as a potential moderator in the relationship between trauma exposure, diet, and sleep quality (Garcia et al., 2017; Lee, 2018; Thompson, 2020). Emotion regulation skills, which include cognitive reappraisal and emotional acceptance, are crucial for mitigating the effects of trauma, promoting adaptive coping strategies, and fostering resilience. Effective emotion regulation can prevent maladaptive behaviors like emotional eating and aid in stress reduction, which may, in turn, improve both dietary habits and sleep quality (Gratz & Roemer, 2004; Aldao et al., 2010). A recent study has shown that emotional regulation is a moderator of the relationship of positive psychology attributes and sleeping quality (Tout, Jessop & Miles, 2024). However, the role of emotion regulation in moderating the impact of trauma exposure on diet and sleep quality has yet to be fully explored, particularly in the context of Uyo Metropolis, where socio-cultural factors may influence both emotional processing and health behaviors.

Given the high prevalence of trauma exposure and dietary concerns, as well as the critical role of sleep quality in maintaining health, examining the moderating role of emotion regulation in these relationships could offer valuable insights for interventions. Hence, this study aims to contribute to a broader understanding of these complex relationships and to inform the development of targeted strategies for promoting well-being among adults in Uyo Metropolis.

Base on this backdrop, the following hypotheses were posited in this study:

1. Emotion regulation will correlate positively with sleep quality among adults in Uyo Metropolis.
2. Trauma Exposure will correlate negatively with sleep quality among adults in Uyo Metropolis.

3. Diet will correlate positively with sleep quality among adults in Uyo Metropolis.
4. Emotion Regulation will moderate the relationship between trauma exposure, diet, and sleep quality among adults in Uyo Metropolis.

METHOD

Participants

A sample of 300 participants comprised of males 172 (57.3%) than females 128 (42.7%) were drawn from Adults in Uyo metropolis who are undergraduates from University of Uyo selected from eleven (11) Departments (Political Science and Public Administration, Communication Arts, Accounting, English, History and International Studies, Psychology, Guidance and Counseling, Medicine and Surgery, Human Anatomy, Law, Pharmacy and Computer Science) in Uyo. Their age ranged from 18-39 years, with a mean age of 23.8years. The purposive sampling was adopted to identify cases and individuals who have the characteristics that was needed in the study. A significant proportion of participants (38.3%) were aged 18–25 years, followed by those aged 26–30 years (32.7%) and 31–39 years (29.0%). Regarding marital status, a majority of participants were single (65.0%), while 30.7% were married, and a smaller percentage (4.3%) were divorced or widowed. Academic qualifications varied, with most participants holding a Bachelor's degree (44.0%) or a Diploma (32.7%). Fewer participants had only a Secondary School Certificate (15.7%), and a minority (7.7%) reported having a Postgraduate Degree.

Instrument

Four instruments were used to collect data for this study. They are: Emotion Regulation Questionnaire (ERQ), Trauma History Questionnaire (THQ), Diet and Behaviour Scale (DABS); and the Sleep Quality Scale (SQS). The instruments were stapled together and arranged in five sections: A, B, C, D, and E.

Section A was demographic variables including age, gender, marital status and educational qualification.

Section B was the Emotion Regulation Questionnaire (ERQ). This scale was developed by Gross (2003). It is a 10-item scale designed to measure respondents' tendency to regulate their emotions in two ways: (1) Cognitive Reappraisal and (2) Expressive Suppression. Respondents answer each item on a 7-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree). Items 1, 3, 5, 7, 8, 10 make up the Cognitive Reappraisal facet while Items 2, 4, 6, 9 make up the Expressive Suppression facet. Scoring was kept continuous and each facet's scoring is kept separate. A total, cross-situational score was obtained by averaging the product score of all, ten situations in the measure. Thus, a person's overall emotion regulation score could range from 10 to 70. The ERQ- short version was subjected to a pilot study to assess its reliability. All ten items were reliable having met the cut off coefficient of 0.30 of the item-total correlation. The mean for the scale is 33.2300. This implies that scores from 33.2 above indicate high/negative emotion regulation, while scores below 33.3 indicate low/positive emotion regulation.

Section C was the Trauma History Questionnaire (THQ). This is a 24-item self-report measure that measures the history of exposure to highly stressful events, and the influence of childhood trauma on symptoms of depression, anxiety and stress disorder in adulthood using a yes/no format. For each event individuals are asked to provide the frequency of the event as well as their age at the time and the event. Answers to these questions are used to understand the individual's history of exposure to traumatic events, and to target the development of specific skills to create wellness and avoid re-traumatization. Only 17 items on the scale were reliable after being subjected to a pilot study and meeting the cut off coefficient of 0.30 in item-total correlation. The mean for the scale is 9.1200. This implies that scores from 9.1 and above indicate high trauma exposure, while scores below 9.1 low trauma exposure.

Section D was the Sleep Quality Scale (SQS), consisting of 28 items, the SQS evaluates six domains of sleep quality: daytime symptoms, restoration after sleep, problems initiating and maintaining sleep, difficulty waking, and sleep satisfaction. The scale has been validated in individuals aged 18–59 years and revalidated for participant 18-39 years. Using a four-point, Likert-type scale, respondents indicate how frequently they exhibit

certain sleep behaviours (0 = "few," 1 = "sometimes," 2 = "often," and 3 = "almost always"). Scores on items belong to factors 2 and 5 (restoration after sleep and satisfaction with sleep) and are reversed before being tallied. Higher scores connote more acute sleep problems and lower score demotes less acute sleep problem.

The Sleep Quality Scale (SQS) was subjected to a pilot study to assess its reliability. Items 16, 23, 24 and 28 of the SQS were discarded after failing to meet the cut off coefficient of 0.30 in item-total correlation. The remaining items after this were 24, as opposed to the initial 28 (see appendix 3D). The mean for the scale is 58.6. meaning, scores from 58.6 above indicate good quality sleep, while scores below 58.6 indicate poor quality sleep.

Procedure

Participants were individually approached and administered the instrument, which is the use of questionnaires. The questionnaire was for age 18years and above, participant were giving informed consent to participate in the exercise voluntarily and it's met for academic research purposes. Some of the participants were a bit reluctant to fill the questionnaires initially, but complied after they were assured that their identity will be anonymous in the participatory exercise. The researcher was present to guide participants through the instructions and items of the questionnaire. A total of 320 questionnaires were produced and distributed. However, only 309 were collected, yielding a return rate of 96.6 percent. Out of the 309 returned copies of the questionnaire form, 9 were eliminated owing to discrepancies or unusual response patterns, yielding a 93.8 percent response rate.

Statistics

The data collected for the study were analyzed using multiple regression and moderation analysis. Multiple regression analysis was used to determine the direct relationships between trauma exposure, diet, and sleep quality. The moderating role of emotion regulation was assessed using Hayes' PROCESS macro (Model 1) in SPSS, which allows for the exploration of interaction effects between variables. Descriptive statistics, including mean and standard deviation, were used to summarize the data, while Pearson's correlation assessed the relationships among the study variables.

Ethical consideration

Ethical concerns revolve around confidentiality and anonymity of data. These concerns were mitigated as participants were asked for informed consent and the data was handled confidentially using appropriate protocols including anonymization of data and results. To achieve this, the university google shared drive system was used to store the data. Also, the Institutional Review Board (IRB) gave their permission for the conduct of this study.

RESULT

The results of the findings of this study are presented in this chapter. The correlations of the demographic variables and study variables are shown in Table 1. In the correlations, relevant demographic variables such as gender, age, educational status, marital status were included in the analysis. Those that were significantly correlated with sleep quality are included in the moderation analysis as covariates (i.e., control variables) in order to partial out their effects. The moderation results for testing the hypotheses are in Tables 2. Slopes of moderation (interaction graph) is plotted where the interaction term is significant, otherwise, the slopes will be discarded.

Table 1:Summary Of Pair-wise Correlations of Demographic and Study variables

Variables		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1	Age	-							
2	Gender	18**	-						
3	Marital Status	.20**	.19**	-					
4	AQ	.22**	.17**	.21**	-				

5	ER	.19**	.24**	.20***	.22**	-			
6	TE	-.18**	-.16**	-.16**	-.15**	-.17*	-		
7	Diet	.22**	.21**	.28***	.29**	.12*	-.17***		
8	Sleep Quality	.23**	30**	.22***	.20**	.31**	-.30**	.20**	-

Note.***p < .001; **p < .01; p < .05; AQ = Academic qualification; ER = Emotion Regulation; TE = Trauma exposure;

Table 1 revealed that age was positively correlated with gender, marital status, academic attainment, emotion regulation, diet and sleep quality but negatively associated with trauma exposure. Furthermore, gender was positively associated with marital status, academic attainment, emotion regulation, diet and sleep quality but negatively correlated with trauma exposure. Similarly, marital status was positively correlated with academic attainment, emotion regulation, diet and sleep quality but negatively associated with trauma exposure. Moreover, academic attainment was positively correlated with emotion regulation, diet and sleep quality but negatively associated with trauma exposure. Meanwhile, emotion regulation was positively associated with diet and sleep quality but negatively correlated with trauma exposure. On its part, trauma exposure was negatively correlated with diet and sleep quality while diet was positively associated with sleep quality.

Table 2: Moderation Analysis Results Predicting Sleep Quality from Participants' Emotion Regulation, Trauma Exposure and Diet scales

Predictors	Coefficient	*SE*	*T*	*P*	95% CI
Emotion Reg. (ER)	.10	.01	16.25	.000	-[.05, -.07]
Trauma Exp (TE)	-.08	.02	-10.91	.02	[.08, .02]
Diet (DT)	.09	.00	14.86	.000	[.01, .01
ER x TE x DT	.08	00	11.97	.000	[.01, .01
Gender	.07	.04	9.75	.10	[.02, .03]
Marital status	.05	.05	7.94	.13	[.02, .07]

Note: Total R^2 = .29, F (2, 296) = 59.13; p < .001

In Table 2, emotion regulation was positively associated with sleep quality among adults in Uyo metropolis (β = .10, t = 16.25, p < .001), indicating that for every one unit rise in emotion regulation, sleep quality among adults in Uyo metropolis increased by .10 units. This finding confirmed hypothesis 1, which posited that emotion regulation will be positively associated with sleep quality among adults in Uyo metropolis.

Trauma exposure was negatively associated with sleep quality among adults in Uyo metropolis. (β = -.08, t = -10.91 p < .001), indicating that for every one unit rise in trauma exposure, sleep quality among adults in Uyo metropolis decreased by .08 units.This finding supported hypothesis 2, which posited that trauma exposure will be positively associated with sleep quality among adults in Uyo metropolis.

Diet was positively associated with sleep quality among adults in Uyo metropolis (β = .09, t = 14.86, p < .001), showing that for every one unit rise in diet, sleep quality among adults in Uyo metropolis increased by .09 units. This finding supported hypothesis 3, which posited that diet will be positively associated with sleep quality among adults in Uyo metropolis.

The interaction effect of emotion regulation, trauma exposure and diet on sleep quality among adults in Uyo metropolis was significant (β = .08, t = 11.97 p < .001), showing that emotion regulation moderated the relationship between trauma exposure and diet on sleep quality among adults in Uyo metropolis. This finding confirmed hypothesis 4, which stated that emotion regulation will moderate the relationship between trauma

exposure and diet on sleep quality among adults in Uyo metropolis. The control variables in the model, gender and marital status were both positively associated with pathological gambling among undergraduate students (β = .07, t = 9.75, p = .10, and β = .05, t = 7.94 p = .01), respectively. All the variables in the model explained 29% of the variance in sleep quality among adults in Uyo metropolis (R^2 = .29).

DISCUSSION

The first finding of the study was that Emotion regulation correlated positively with sleep quality among adultsin Uyo Metropolis. This findings confirmed the first hypothesis which stated that emotion regulation will correlate positively with sleep quality. This finding is consistent with the study conducted by Smith et al. (2021) examined the relationship between emotion regulation strategies and sleep quality among college students showing that adaptive strategies like cognitive reappraisal were linked to better sleep outcomes.

The second finding of the study was that trauma exposure correlated negatively with sleep quality among adults in Uyo Metropolis. The finding confirmed the second hypothesis which state that Trauma exposure negatively will correlate negatively with sleep quality. This finding supported the study conducted by Babson, Feldner, and Badour (2012), examined the association between traumatic event exposure and sleep quality in a sample of college students. The results indicated a significant association between traumatic event exposure and poorer sleep quality in college students. Similarly, this finding is consistent with a study by Krakow et al. (2001), investigated the impact of trauma on sleep quality among individuals with posttraumatic stress disorder (PTSD). The findings revealed that individuals with PTSD experienced more frequent nightmares, sleep disturbances, and overall poorer sleep quality compared to non-PTSD individuals.

The third finding of the study was that diet correlated positively with sleep quality among adults in Uyo Metropolis. This finding confirmed the third hypothesis which states that diet will correlate positively with sleep quality. This finding is consisted with the study by St-Onge et al. (2016), examined the association between diet quality and sleep duration in adults. The findings supported the result that individuals with poor diet quality, characterized by higher consumption of refined grains, added sugars, and saturated fats, had shorter sleep duration and lower sleep efficiency compared to those with a healthier diet. Another study by Grandner et al. (2014) explored the relationship between specific nutrients and sleep quality in a large sample of adults. The researchers found that higher intake of fiber, vitamin C, and lycopene was associated with better sleep quality, while higher intake of saturated fat and added sugars was linked to poorer sleep.

Finally, the fourth finding of the study was that emotion regulation moderated the relationship between trauma exposure, diet, and sleep quality among adults in Uyo Metropolis. This implies that demonstrate that emotion regulation has the capacity to buffer the adverse effects of trauma exposure and enhance the positive effects of diet on sleep quality. The finding confirmed the fourth hypothesis which states that emotion regulation will moderate the relationship between trauma exposure, diet, and sleep quality among adults. This finding is consistent with the study by Mason et al. (2021), investigated the mediating role of emotion regulation on the relationship between trauma exposure and disordered eating behaviours. The findings supported the result that individuals who had experienced trauma were more likely to engage in maladaptive eating behaviours, and this relationship was partially mediated by difficulties in emotion regulation. Similarly, a study by Harris and Allen (2018) explored the links between trauma exposure, sleep disturbances, and emotion regulation in a sample of young adults. The results supported that trauma exposure was associated with both sleep disturbances and difficulties in emotion regulation, suggesting a complex interrelationship among these variables.

Limitations and Suggestions for Future Studies

This study had several limitations that should be addressed in future research. First, the cross-sectional design used in this study limits the ability to establish causal relationships between trauma exposure, diet, sleep quality, and emotion regulation. Future research could benefit from adopting longitudinal designs to explore the temporal and directional relationships among these variables more comprehensively.

Additionally, the study relied exclusively on self-reported measures, which may have introduced shared method variance, potentially inflating the relationships between variables. To address this limitation, future studies could adopt a multi-method approach, incorporating behavioral assessments, clinical observations, or physiological

measures (e.g., sleep tracking devices) to provide a more nuanced understanding of these associations.

The sample was drawn solely from adults in Uyo Metropolis, which may limit the generalizability of the findings to other populations or cultural contexts. Future studies should aim to replicate these findings in more diverse populations, including individuals from different geographic regions and socio-economic backgrounds. Collecting more detailed demographic data—such as income level, occupational status, and health conditions—could also provide valuable insights into additional factors influencing the relationships examined in this study.

Moreover, the study did not account for the potential influence of prior trauma experiences or adverse childhood events, which may have shaped participants' current trauma exposure and emotion regulation capabilities. Future research could incorporate assessments of early-life trauma to better understand how such experiences contribute to the observed relationships.

Lastly, while emotion regulation was identified as a significant moderator in this study, future research could explore additional moderators or mediators, such as social support, resilience, or mental health status, to further clarify the pathways linking trauma exposure, diet, and sleep quality.

Implications of The Findings

The first finding of the study was that emotion regulation correlated positively with sleep quality among adults in Uyo Metropolis. This finding implies that individuals who are better able to regulate their emotions tend to experience higher quality sleep. In other words, people who have effective strategies for managing their emotions may also have better sleep patterns. This correlation suggests a potential link between emotional well-being and sleep quality, indicating that addressing emotional regulation could be beneficial for improving sleep outcomes in adults.

The second finding of the study was that trauma exposure correlated negatively with sleep quality among adults in Uyo Metropolis. This finding implies that individuals who have experienced trauma tend to have lower sleep quality. The negative correlation suggests that higher levels of trauma exposure are associated with poorer sleep outcomes among adults. It suggests that past traumatic experiences may disrupt sleep patterns or contribute to sleep disturbances. Addressing trauma exposure and its associated effects may be important for improving sleep quality and overall well-being in this population.

The third finding of the study was that diet correlated positively with sleep quality among adults. This finding implies that individuals who have healthier dietary habits tend to experience better sleep. This correlation indicates that consuming a balanced and nutritious diet may contribute to improved sleep outcomes. Factors such as the types of foods consumed, meal timing, and overall dietary patterns could all play a role in influencing sleep quality. Addressing diet quality may therefore be a valuable approach for promoting better sleep among adults in this population.

Finally, the fourth finding of the study was that emotion regulation moderated the relationship between trauma exposure, diet, and sleep quality among adults in Uyo Metropolis. This finding implies that the ability to regulate emotions buffers the relationship of trauma exposure, diet, and sleep quality. It suggests that individuals with strong emotion regulation skills may be better equipped to mitigate the negative impact of trauma exposure on sleep quality, as well as to amplify the positive effects of a healthy diet on sleep.

In essence, emotion regulation acts as a buffer or protective factor, influencing how trauma exposure and dietary habits impact sleep outcomes. This suggests that interventions aimed at improving emotion regulation skills may help mitigate the adverse effects of trauma exposure on sleep and enhance the beneficial effects of a healthy diet. It highlights the importance of considering emotional factors in interventions targeting sleep quality among adults in this population.

CONCLUSION

The study investigated the relationship the relationship between trauma exposure, diet and sleep quality, taking into consideration the moderating role/effect of emotion regulation among Adults In Uyo Metropolis. It explored

theoretically, empirically and statistically, the extent to which emotion regulation was positively associated with diet and sleep quality but negatively correlated with trauma exposure. On its part, trauma exposure was negatively correlated with diet and sleep quality while diet was positively associated with sleep quality. In concluding based on the results, all hypotheses were accepted as they were significant. The study used well-structured questionnaires and moderating analysis to test the hypotheses stated in the study.

Declaration of Conflicting Interest

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