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The Role of Interoceptive Awareness in Predicting Emotion Regulation and Sleep Quality

Devika Katoch[1]

[1]Amity University, Noida

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Abstract: The current study has focused on the predictive power of interoceptive awareness in determining the emotion regulation and sleep quality of young adults. Interoceptive awareness has been defined as the ability to sense, and respond to, and interpret inner bodily sensations. More and more, interoceptive awareness is being used as a defining factor in emotional and or physiological regulation. The studies that have looked at this construct, however, have not integrated emotion regulation and sleep quality with it, especially in non-clinical populations. A predictive, correlational, cross-sectional, quantitative design was leveraged. 157 young adults ages 18 to 30 years participated in this study. Participants completed self-reports using these instruments: Multidimensional Assessment of Interoceptive Awareness - Version 2 (MAIA-2), Emotion Regulation Questionnaire (ERQ), and PROMIS Sleep Disturbance - Adult Short Form. To analyse the data, descriptive statistics, Pearson's correlation, and simple linear regression were performed. The findings revealed a significant positive relationship between interoceptive awareness and emotion regulation, indicating that individuals with greater bodily awareness demonstrated more effective emotional regulation strategies. Interoceptive awareness was also found to be significantly and negatively associated with sleep disturbance, suggesting better sleep quality among individuals with higher interoceptive awareness. Regression analyses indicated that interoceptive awareness significantly predicted emotion regulation, while sleep disturbance showed a modest yet significant predictive relationship with interoceptive awareness.

Keywords: *Interoceptive Awareness, Emotion Regulation, Sleep Quality, Young Adults, Clinical Psychology.*

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I. INTRODUCTION

➢ *Overview of the Study*

In the last few decades, psychology has begun to focus more on integrative approaches which consider the interplay between different physiological, emotional, and behavioural processes. The psychological approaches that have traditionally focused on the cognitive or affective dimensions of psychological distress have begun to think of bodily awareness as being equally important to psychological well-being. Within this new paradigm, the concept of interoceptive awareness has been positioned at the intersection of bodily feelings and emotions. Interoceptive awareness is defined as the perception of and the ability to pay attention to, and respond to, one's internal bodily feelings, such as those related to heartbeat, breathing, hunger, muscle tension, temperature and internal organs. (Barrett & Simmons, 2015). Being interoceptively aware means, emotionally and cognitively, attending to these internal bodily processes. Contemporary theorists have argued that emotional experiences are built on the body's internal state, as emotions are associated with certain bodily responses.

Emotion regulation describes the ability to respond to environmental stressors and challenges while managing the emotional response and its expression. Emotion regulation is one of the predictors of positive interpersonal relationships, psychological resilience, and overall mental well-being. On the other hand, poor emotion regulation is connected to psychological problems and disorders, including anxiety disorders, depression, stress disorders, and psychosomatic symptoms (Morin & Benca, 2012). For emotion regulation to be successful, there is a need to be aware of the emotions and bodily reactions, showing the role of awareness of inner bodily and emotional states, or interoceptive awareness (Gross & John, 2003).

The other aspect of physical and psychological well-being is the quality of sleep. The psychological and physical restoration, cognitive functioning, and emotional regulation need good quality sleep. Emotional regulation, stress management, concentration, and risk of mental disorders are all negatively affected by poor sleep quality. The internal emotional experiences and physiological processes are known to affect the quality of sleep, and they also affect the awareness of the internal body experiences (Harvey, 2008). Therefore, the relationship between the awareness of the

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internal body experiences and the regulation of sleep requires further investigation. This research aims to understand interoceptive awareness's role in predicting the ability to regulate emotions and the quality of sleep in adults.

- *Background of the Study*

The term interoception is a result of the integration of early theories, both physiological and psychological, that emphasized the role of emotional experiences in bodily sensations. The construction and advancement of cognitive psychology and neuroscience showed that the so-called interoceptive signals took convoluted neural pathways, especially those connected with emotion, self-awareness and self-regulation. This research reaffirmed the premise that awareness of one's body is central to an emotional phenomenon. In the field of psychology, the relationship between interoceptive awareness, adaptive functioning and mental health has also been explored increasingly. Higher levels of interoceptive awareness are associated with less emotional avoidance, better psychological flexibility, more adaptive emotion regulation techniques, and increased emotional clarity. Low interoceptive awareness, on the other hand, is linked to problems recognizing and controlling emotions, elevated levels of anxiety and alexithymia, emotional dysregulation, and a greater dependence on unhealthy coping strategies.

The importance of psychological health is recognized universally and is, among other things, determined by the ability to regulate one's emotions. The ability to regulate one's emotions is a multi-stage process that includes the awareness of one's emotions, the interpretation of those emotions, and the modulation of the emotions. Problematic emotional responses occur when there is a deficiency in one of these processes. The ability to recognize one's emotions is thought to strengthen the very first steps of emotional regulation by helping an individual recognize their feelings and the bodily changes that accompany arousal (Morin & Benca 2012).

Research on sleep has noted the importance of the emotional and physiological regulation of the body in the attainment of quality sleep. Sleep onset and sleep maintenance difficulties are associated with emotional and physiological distress and the use of emotion regulation strategies such as the suppression of emotions and rumination. (Ong. et al, 2012). It is possible that interoceptive awareness can influence sleep quality by helping people respond to bodily changes associated with heightened emotional arousal. Theoretical connections among interoceptive awareness, sleep quality, and emotion regulation have yet to be studied in an empirical manner. This study analyses these issues in an adult population.

- *Theoretical Framework*

This research integrates psychological and neuroscientific theories on the interrelations of emotional functioning, sleep regulation, and body awareness. The foundation for understanding the relationship among interoceptive awareness, emotion regulation and sleep quality has been taken from the Interoceptive Predictive Coding Theory, the Process Model of Emotion Regulation, and Cognitive-Behavioural Theories of Sleep, to build an initial framework to analyze interoceptive awareness, emotional regulation, and sleep quality.

The Interoceptive Predictive Coding Model, one of the primary theories of this study, explains the processes involved in the recognition and interpretation of the body's internal physiological signals. In this model, the brain is viewed as an internal predictor of the body and makes 'predictions' about the body, which are compared to the body's internal signals. Emotion dysregulation and psychological distress may occur if the body's signals are misunderstood. However, if the body signals are understood correctly, it is said to produce positive emotional regulation and awareness (Barrett & Simmons, 2015; Seth, 2013). The insula, as Craig (2009) has pointed out, is one of the most important interoceptive centres of the brain and integrates information provided from the body with emotional and cognitive systems to produce emotional awareness and self-knowledge. The greater interoceptive awareness one has, the better one can recognize emotional arousal and act appropriately.

Gross's Process Model of Emotion Regulation looks at emotion regulation as a process that takes place at different levels of emotional experience, such as situation selection, attention deployment, cognitive reappraisal, and response modulation (Gross, 1998; Gross & John, 2003). In this model, effective emotional regulation hinges on one's awareness and appraisal of a particular emotional and/or physiological response. Because of limited bodily awareness, people may rely on maladaptive suppression or avoidance, whereas people who can identify bodily signals caused by an emotional surge tend to rely on cognitive reappraisal as an adaptive emotion regulation strategy. Given this model, it is reasonable to examine interoceptive awareness as a predictor of emotion regulation.

The current study benefits from Harvey's Cognitive Model of Insomnia and other Cognitive-Behavioural Models of Sleep. This approach posits that sleep disorders stem from disabling beliefs about sleep, cognitive and physiological hyperarousal, as well as maladaptive coping strategies like emotional repression and ruminative thinking (Harvey, 2002; Harvey, 2008). Emotional arousal and distress combine to inhibit sleep onset and maintenance. Therefore, effective emotional and physiological arousal regulation is crucial for protecting sleep. This is where interoceptive awareness may improve sleep: it helps individuals to recognize and respond to stress before it manifests as a problem, thus assisting people to better sleep.

Moreover, this approach resonates with concepts of non-judgmental awareness of the body from the realms of mindfulness and body awareness. The awareness of emotional and physiological phenomena enhances overall psychological health. The ability to focus mindfully on one's body has been shown to improve emotional regulation, reduce ruminative thinking, and mitigate the stress response, all of which lead to improved sleep quality (Kabat-Zinn, 2003; Mehling et al., 2012). These ideas support the premise that

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26feb1062

interoceptive awareness links emotional and physiological functions.

All of these theoretical stances point to interoceptive awareness as a fundamental psychological concept that affects both emotional control and the quality of sleep. A thorough framework for investigating how awareness of internal physical processes influences emotional and sleep functioning in adults is provided by the integration of predictive coding, emotion regulation theory, and cognitive-behavioural sleep models. Based on this concept, the current study suggests that increased interoceptive awareness is linked to enhanced sleep quality and greater emotion control skills.

➢ *Problem Statement*

The empirical research has yet to examine the relation of interoceptive awareness, emotion regulation, and sleep quality. Most studies focus on sleep disruption and emotion regulation, ignoring the possible interoceptive processes involved. Many adults, even those without a psychological disorder, struggle with emotional dysregulation and sleep disruption. These issues manifest chronically, decreasing one's quality of life, disrupting one's work functioning, and increasing one's risk for mental health problems. People may become less effective at coping and sleeping due to a lack of awareness of their emotional and physiological dysregulation.

The current research attempts to fill these outlined gaps by defining interoceptive awareness and charting its relationship to the regulation of emotions and the quality of sleep.

➢ *The Need for the Study*

The role of body awareness in emotional and sleep-related psychological health is significant and needs to be factored into psychological research. The interconnection among body awareness, emotional regulation and sleep quality needs to be understood in both theoretical frameworks and practical applications.

In preventative mental health, emotional regulation and sleep quality, primarily in adults, should be prioritized. Interoceptive awareness can be viewed as a flexible psychological construct, particularly because it can be developed through various therapeutic approaches such as mindfulness, somatic therapy, and biofeedback.

The majority of previous research has been focused on clinical populations, which justifies exploring these relationships apart from the clinical populations. Understanding these interrelationships will also be important at a societal level, particularly in identifying patterns of emotional health and sleep quality.

➢ *Objectives of the Study*

The objectives of the present study are:

- To assess the level of interoceptive awareness among adults.
- To examine the relationship between interoceptive awareness and emotion regulation.
- To examine the relationship between interoceptive awareness and sleep quality.
- To determine whether interoceptive awareness predicts emotion regulation abilities.
- To determine whether interoceptive awareness predicts sleep quality.

II. RESEARCH METHODOLOGY

➢ *Research Design*

The present study used a quantitative, primary, cross-sectional research design to study the role of interoceptive awareness in predicting emotion regulation and sleep quality in adults. A predictive-correlational framework was used to study the relational attributes of interoceptive awareness, emotion regulation, and sleep quality. Since the focus was to study relationships, this approach was the best choice to study relationships without the influence of any control or manipulatory measures. The study aimed to examine the relationships between the constructs of psychology; hence, the cross-sectional design was the best in collecting data at a single point and then assessing the interrelationships of the constructs. The selection of quantitative methods was to sustain the objectivism, the statistical integrity, and the generalizability of the found truth.

- *Aim of the Study*

The present study aims to understand the impact of interoceptive awareness on emotion regulation and sleep quality in adults.

➢ *Variables of the Study*

The study included the following variables:

- Independent Variable: Interoceptive Awareness
- Dependent Variables: Emotion Regulation and Sleep Quality

➢ *Operational Definitions of Variables*

- Interoceptive Awareness: The conscious awareness and appraisal of internal bodily sensations such as breathing, heartbeat, and bodily tension, measured using the Multidimensional Assessment of Interoceptive Awareness (MAIA-2).
- Emotion Regulation: The strategies individuals use to manage and modify emotional experiences, assessed using the Emotion Regulation Questionnaire (ERQ).
- Sleep Quality: The subjective experience of sleep disturbance, restfulness, and sleep-related problems, measured using the PROMIS Sleep Disturbance Short Form.

➢ *Population of the Study*

The target population for the present study comprised of adults aged 18 to 30 years. This age range was selected to capture a broad adult population experiencing diverse

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academic, occupational, and interpersonal demands that may influence emotional functioning and sleep patterns.

➢ *Hypotheses of the Study*

Based on the objectives of the study and existing theoretical and empirical literature, the following hypotheses were formulated and tested:

- H1: There will be a significant relationship between interoceptive awareness and emotion regulation.
- H2: There will be a significant relationship between interoceptive awareness and sleep quality.
- H3: Interoceptive awareness will significantly predict emotion regulation.
- H4: Interoceptive awareness will significantly predict sleep quality.

➢ *Sample and Sampling Technique*

- *Sample Size*

The final sample consisted of 157 participants. The sample size was considered adequate for conducting correlational and regression analyses, ensuring sufficient statistical power to detect meaningful relationships among variables.

- *Sampling Technique*

A non-probability convenience sampling technique was used to recruit participants. This method was chosen due to feasibility, accessibility, and time constraints. Participants were recruited through online platforms and voluntary participation.

➢ *Inclusion and Exclusion Criteria*

- *Inclusion Criteria*

✓ Adults aged between 18 and 30 years
✓ Ability to read and understand English
✓ Willingness to provide informed consent

- *Exclusion Criteria*

✓ Individuals currently diagnosed with severe psychiatric or neurological disorders
✓ Individuals undergoing treatment for severe sleep disorders
✓ Incomplete or invalid questionnaire responses

➢ *Tools for Data Collection*

Standardized, reliable, and validated instruments were used to collect data for the study.

- *Multidimensional Assessment of Interoceptive Awareness (MAIA-2)*

The MAIA-2, or Multidimensional Assessment of Interoceptive Awareness, is a self-report measure of interoceptive awareness developed by Mehling WE, Acree M, Stewart A, Silas J, Jones A (2018). The scale covers a variety of areas, including noticing, emotions, awareness, attention regulation, self-regulation, body listening, and trust in bodily sensations. The MAIA has proven good psychometric properties and is valid and reliable for use in the adult population.

- *Emotion Regulation Questionnaire (ERQ)*

Developed by Gross & John (2003), the Emotion Regulation Questionnaire (ERQ) is a self-report instrument assessing individual variations in habitual emotion regulation strategies. The scale assesses predominantly two dimensions: cognitive reappraisal and expressive suppression. The ERQ is a widely used instrument that has a long and extensive history of validation and is reliable across different contexts. The questionnaire is also used in clinical and research settings to measure adaptive and maladaptive strategies of emotion regulation.

- *PROMIS Sleep Disturbance – Short Form*

A group of researchers from the University of Pittsburgh created the PROMIS—Sleep Disturbance—Short Form 8a as a component of the NIH PROMIS program.

The following people were the main creators: Daniel J. Buysse, Lan Yu, Paul A. Pilkonis (2011).

The PROMIS Sleep Disturbance Short Form is a standardized self-report instrument designed to assess perceptions of sleep quality, sleep depth, and sleep-related difficulties. The scale captures subjective experiences of sleep disturbance over a specified time frame. The PROMIS sleep measure has demonstrated strong reliability, validity, and sensitivity to variations in sleep quality among adult populations.

Table 1 Reliability and Validity of the Study Instruments

Scale	Reliability (Cronbach's α)	Validity
Multidimensional Assessment of Interoceptive Awareness – Version 2 (MAIA-2)	0.70 – 0.89	Strong construct, convergent, and discriminant validity
Emotion Regulation Questionnaire	0.72 – 0.82	Established construct and criterion validity
PROMIS Sleep Disturbance – Adult Short Form	≥ 0.85	Strong construct and criterion validity

➢ *Procedure for Data Collection*

The collection of data occurred through an online survey. Participants were informed what the study entailed and were assured their answers would be kept confidential. Consent was acquired before the participants were able to proceed. The order of the questionnaires was as follows: demographic questions, MAIA-2, ERQ, and lastly, the PROMIS Sleep Disturbance Short Form.

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Participants were asked to answer the questions truthfully and were instructed to answer based on their own opinions. Participants were briefed that there were no right or wrong answers. The survey took an estimate of 15-20 minutes to complete. The data analysis only took into account responses that were complete and valid.

III. ANALYSIS OF RESULT

Table 2 Voluntary Participation of Respondents in the Study

Response	***n***	**%**
Yes	157	100

Note. N=157.

All 157 research participants (100%) consented to take part in the research study, as shown in Table 2 This shows total adherence to the ethical standards of research, supporting the ethical principle of informed consent. The absence of refusal or non-response indicates that the participants fully comprehended the aim and potential impact of the study. In addition, consenting to the study suggests that participants were neither coerced nor unduly influenced to provide certain responses, enhancing the authenticity and reliability of the data obtained.

Table 3 Age Eligibility of Participants (18–30 Years)

Response	***n***	**%**
Yes	157	100

Note. N=157. All participants met the age-based inclusion criterion of 18–30 years.

In Table 3, it can be seen that all of the respondents, n = 157, satisfied the age requirement of 18-30 years. It can be concluded that all of the respondents followed the sampling framework. This also reiterates that the sample is developmentally homogeneous. Young adults were particularly chosen, considering that they are the age group that largely demonstrates increased emotional instability, rapid changes in both the educational and work settings, and inconsistent sleep patterns. Having a young adult sample in the study decreases developmental variability that is likely to obscure the association between interoceptive awareness, emotion regulation, and sleep quality.

Table 4 Age Distribution of Participants

Age (years)	***n***	**%**
18	6	3.8
19	7	4.5
20	20	12.7
21	25	15.9
22	14	8.9
23	8	5.1
24	6	3.8
25	8	5.1
26	9	5.7
27	12	7.6
28	17	10.8
29	12	7.6
30	13	8.3
Total	157	100.0

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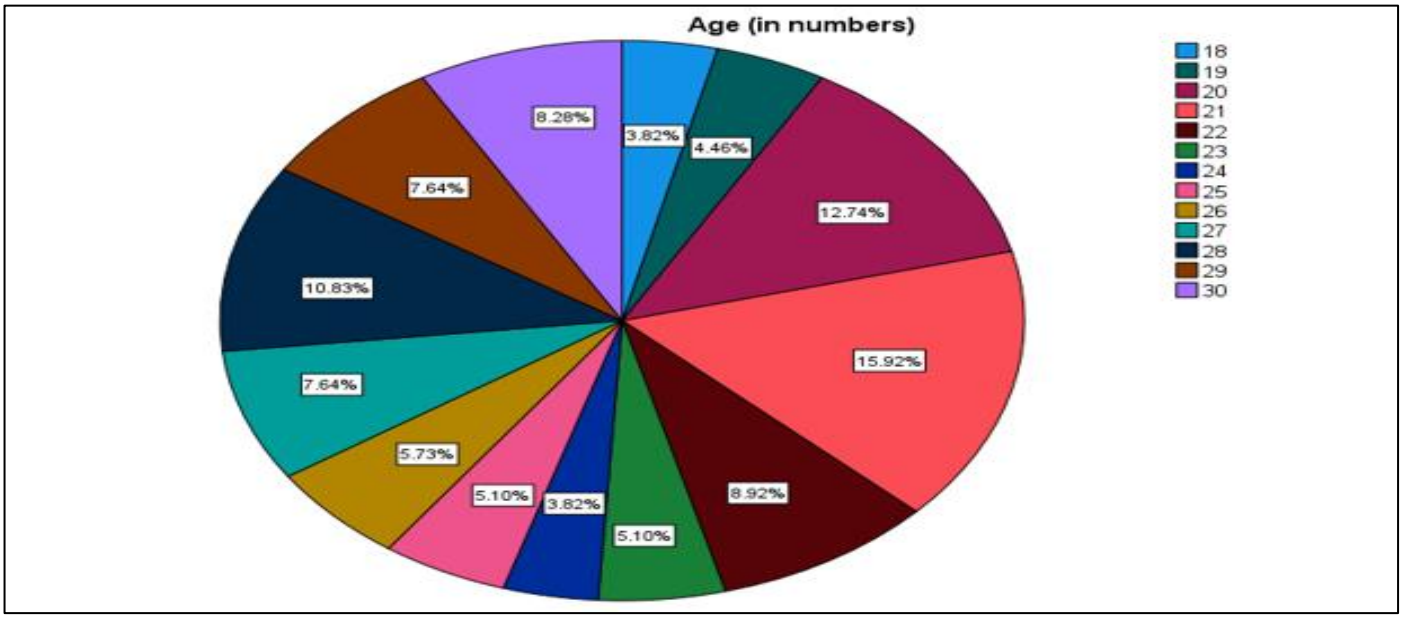

Fig 1 Graphical Representation of Age Distribution of Participants
Note. N=157

The age distribution of the research participants is shown in Table 3 and Figure 4. It can be seen that participants within the 18-30 age range constitute an extensive sample over the entire spectrum of the young adult developmental stage. The age group that represented the highest percentage (15.9%) was 21-year-olds. This was followed by participants of 20 years (12.7%) and 28 years (10.8), which is indicative of an adequate representation of early and later phases of young adulthood. The age groups of 22 years (8.9%), 30 years (8.3%), 27 years (7.6%) and 29 years (7.6%) have low but somewhat adequate representation. The age groups of 18 years (3.8%), 19 years (4.5%), 23 years (5.1%), 24 years (3.8%), 25 years (5.1%) and 26 years (5.7%) are represented in small proportions. The sample age distribution clearly shows a wide range of age representation and the reduction of age clustering improves the generalizability of the findings across the young adulthood age range.

Table 5 Gender Distribution of Participants

Gender	***n***	**%**
Female	66	42.0
Male	91	58.0
Total	157	100.0

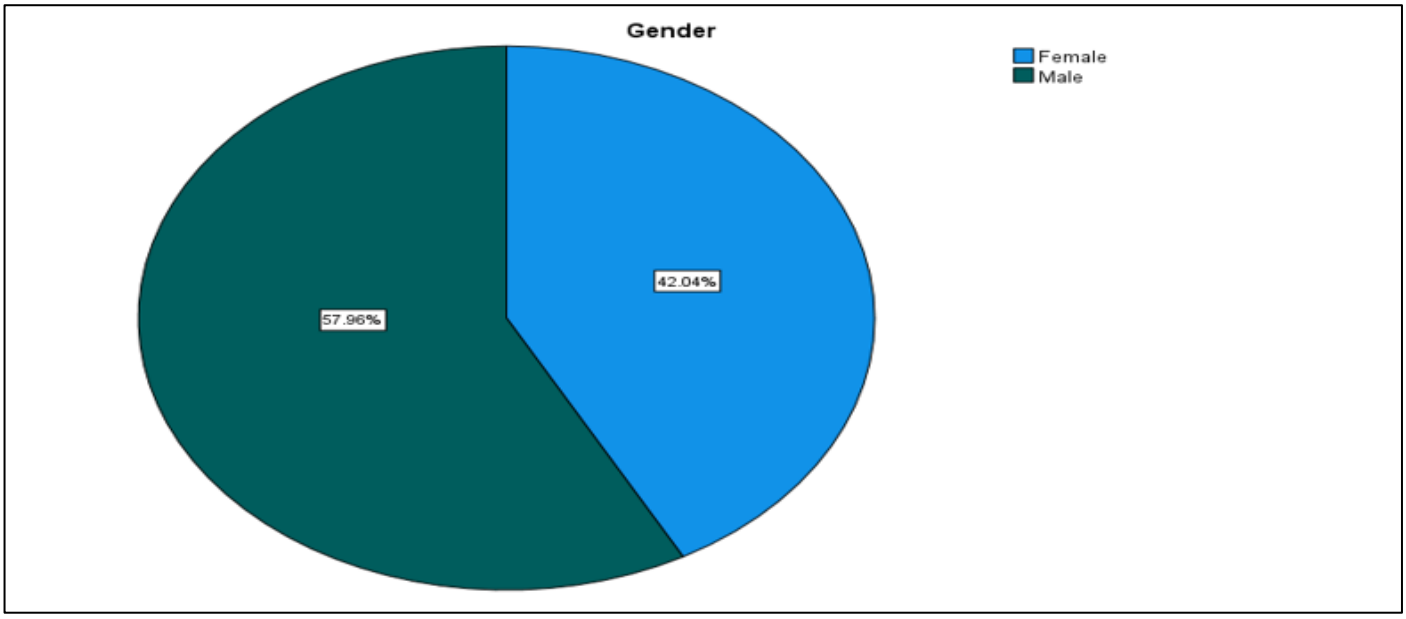

Fig 2 Graphical Representation of Gender Distribution of Participants
Note. N=157

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From the data presented in Table 5 and Figure 2, it can be seen that the sample comprised of 58 % Male participants (n = 91) and 42 % Female participants (n = 66). Gender differentiation is common in interoceptive awareness, emotional regulation strategies, and sleeping patterns. This means that both Male and Female participation is crucial and improves the ecological validity of the study.

Table 6 Highest Educational Qualification of Participants

Educational Qualification	***n***	**%**
Higher Secondary School	3	1.9
Undergraduate (currently pursuing)	62	39.5
Undergraduate (completed)	30	19.1
Postgraduate (currently pursuing)	9	5.7
Postgraduate (completed)	53	33.8
Total	157	100.0

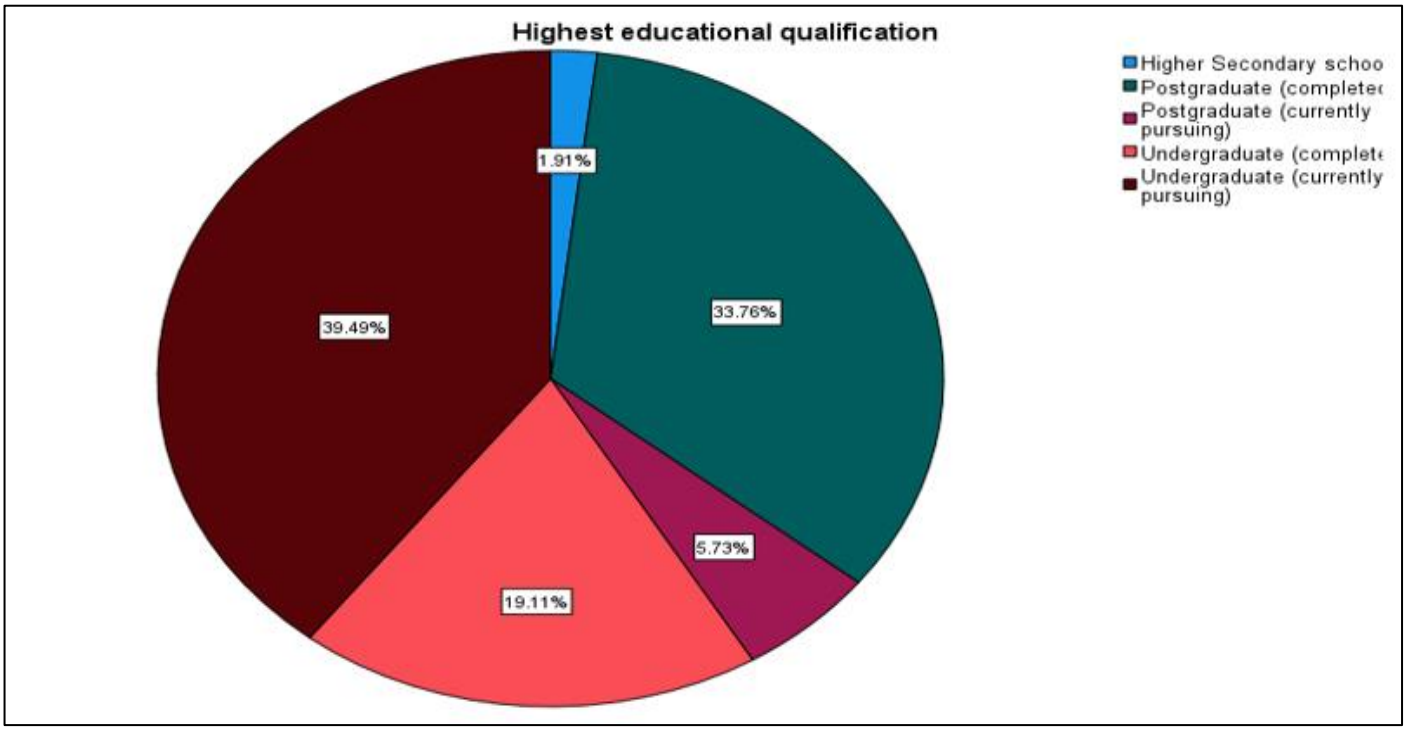

Fig 3 Graphical Representation of Highest Educational Qualification of Participants
Note. N=157

The data from Table 6 and Figure 3 show that most participants had completed, or were in the process of completing, graduate-level studies. The largest proportion of participants were undergraduate students (39.5%). The second largest proportion was of participants with a completed postgraduate degree (33.8%). Furthermore, 19.1% of participants were graduates and 5.7% were postgraduate students. Only 1.9% participants had completed education no higher than secondary school. Having this educational background means that the sample is cognitively active, familiar with the processes of self-analysis and self-report psychological evaluation. Higher levels of education can help participants be more aware of psychological phenomena, emotional and cognitive processes, and sleep pattern activities.

Table 7 Current Occupation of Participants

Occupation	***n***	**%**
Student	74	47.1
Employed	67	42.7
Self-employed	11	7.0
Unemployed	5	3.2
Total	157	100.0

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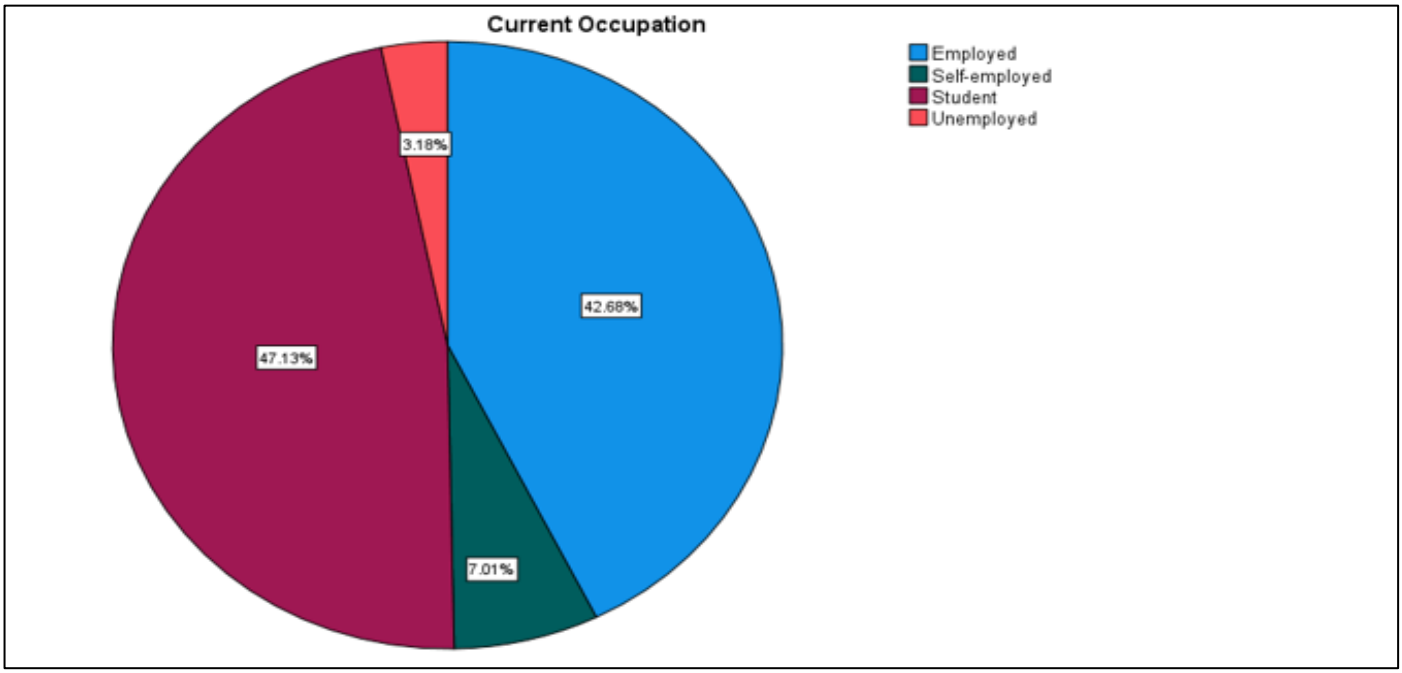

Fig 4 Graphical Representation of Current Occupation of Participants
Note. N=157

The range of participant occupational statuses shown in Table 3.6 and Figure 3.4 offers evidence of diverse and relevant sample composition. Participants who were students comprised almost half (47.1%) of the total. Such a figure demonstrates the high level of academic participation within the young adult demographic. Also notable is the high percentage engaged in working (42.7%). This participation illustrates the extent of occupational responsibilities and empirically demonstrates the indirect control of work-related psychosocial stressors on emotional regulation and sleep hygiene.

A smaller section of the sample was found to be self-employed (7.0%) and unemployed (3.2%) during the collection of data. The range of employment statuses, coupled with the occupational diversity, helps to discover potential psychosocial stressors that can exert an influence on emotional and sleep functioning, thus broadening the scope of the study. The combination of students and adults working provides a better understanding of how interoceptive awareness functions in relation to the external demands of daily life.

Table 8 Descriptive Statistics for Study Variables

Variable	N	Min	Max	M	SD
Interoceptive Awareness (MAIA-2)	157	34	185	114.93	24.26
Emotion Regulation (ERQ)	157	23	70	47.54	8.66
Sleep Disturbance (SDA)	157	8	36	19.45	6.92

Note. N=157. Min = minimum; Max = maximum; M = mean; SD = standard deviation.

Table 8 shows descriptive statistics that were computed to summarize the central tendency and variability of the study variables, namely interoceptive awareness (MAIA-2), emotion regulation (ERQ), and sleep disturbance (SDA).

The MAIA-2 scores ranged from 34 to 185, with a mean score of 114.93 and a standard deviation of 24.26. This suggests a moderate to high level of interoceptive awareness among the participants.

The ERQ scores ranged from 23 to 70, with a mean of 47.54 and a standard deviation of 8.66. These values reflect a moderate level of emotion regulation abilities among the participants.

The Sleep Disturbance—Adult (SDA) scores ranged from 8 to 36, with a mean of 19.45 and a standard deviation of 6.92. This suggests that participants, on average, experienced a moderate level of sleep disturbance, with noticeable variation across individuals.

Table 9 Correlation Between Interoceptive Awareness and Emotion Regulation

Variable	1	2
Interoceptive Awareness (MAIA-2)	—	.27**
Emotion Regulation (ERQ)	.27**	—

Note. N=157. p<.01 (Two-Tailed)

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In Table 9, Pearson's product–moment correlation analysis revealed a positive and statistically significant relationship between interoceptive awareness (MAIA-2) and emotion regulation (ERQ) (r = .274, p = .001). This finding indicates that participants with higher levels of interoceptive awareness tended to exhibit better emotion regulation abilities.

Table 10 Correlation Between Interoceptive Awareness and Sleep Disturbance

Variable	1	2
Interoceptive Awareness (MAIA-2)	—	−.17*
Sleep Disturbance (SDA)	−.17*	—

Note. N=157. p<.05 (Two-Tailed)

In Table 10, Pearson's product–moment correlation analysis revealed a negative and statistically significant relationship between interoceptive awareness (MAIA-2) and sleep disturbance (r = −.174, p = .030). This finding indicates that higher levels of interoceptive awareness were associated with lower levels of sleep disturbance among the participants.

Table 11 Correlation Between Sleep Disturbance and Emotion Regulation

Variable	1	2
Sleep Disturbance (SDA)	—	−.20*
Emotion Regulation (ERQ)	−.20*	—

Note. N=157. p<.05 (Two-Tailed)

In Table 11, Pearson's product–moment correlation analysis revealed a negative and statistically significant correlation between sleep disturbance and emotion regulation (r = −.204, p = .010). This finding indicates that higher levels of sleep disturbance were associated with lower levels of emotion regulation abilities.

Table 12 Variables Entered in Regression Analysis

Model	Variables Entered	Variables Removed	Method
1.	MAIA[b]	.	Enter

Note. Dependent Variable: Emotion Regulation (ERQ)

A simple linear regression analysis was conducted to examine whether interoceptive awareness (MAIA-2) significantly predicts emotion regulation (ERQ) among young adults. In the regression model, MAIA-2 was entered as the independent variable and ERQ was treated as the dependent variable using the enter method.

Table 13 Model Summary for Simple Linear Regression Predicting Emotion Regulation from Interoceptive Awareness

Model	*R*	R^2	Adjusted R^2	*SE* of the Estimate
1	.274[a]	.075	.069	8.355

Note. Predictor= Interoceptive Awareness (MAIA-2); Outcome=Emotion Regulation (ERQ).
SEE= Standard Error of the Estimate.

The Model Summary indicated a correlation coefficient of R = .274, suggesting a positive relationship between interoceptive awareness and emotion regulation. The coefficient of determination (R^2 = .075) revealed that interoceptive awareness accounted for 7.5% of the variance in emotion regulation scores. The modified R^2 value (.069) reiterated that the model kept predictive ability after adjusting for sample size. Even though the proportion of variance explained is modest, it illustrates that interoceptive awareness is a component of emotion regulation.

Table 14 ANOVA Summary for Regression Analysis Predicting Emotion Regulation from Interoceptive Awareness

Source	SS	df	MS	F	p
Regression	879.59	1	879.59	12.60	.001
Residual	10819.47	155	69.80		
Total	11699.06	156			

Note. N = 157. Dependent Variable = Emotion Regulation (ERQ) Predictor = Interoceptive Awareness (MAIA-2).

ANOVA results show that the regression model was statistically significant, F(1, 155) = 12.60, p = .001, meaning the model statistically predicts the results of emotion regulation. This substantiates that interoceptive awareness improves the prediction of emotion regulation beyond chance.

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Table 15 Variables Entered in Regression Analysis

Model	Variables Entered	Variables Removed	Method
1.	MAIA[b]	.	Enter

Note. Dependent Variable: Sleep Disturbance (SDA).

A simple linear regression analysis was conducted to examine whether interoceptive awareness (MAIA-2) significantly predicts sleep disturbance (SDA) among young adults. In the regression model, MAIA-2 was entered as the independent variable and SDA was treated as the dependent variable using the enter method.

Table 16 Model Summary for Simple Linear Regression Predicting Sleep Disturbance from Interoceptive Awareness

Model	*R*	R^2	Adjusted R^2	*SE* of the Estimate
1	.174[a]	.030	.024	6.835

Note. Predictor= Interoceptive Awareness (MAIA-2); Outcome= Sleep Disturbance (SDA). SEE= Standard Error of the Estimate.

The Model Summary stated a correlation coefficient of R = .174, indicating a weak relationship between interoceptive awareness and sleep disturbance. The coefficient of determination (R^2 = .030) said that interoceptive awareness explained 3.0% of the variance for sleep disturbance scores. The adjusted R^2 value of (.024) suggests that the model probably lost some of its explanatory power due to a smaller sample size. The analysis showed that interoceptive awareness did explain some differences in the sleep disturbance scores, even though the proportion of variance explained was quite low.

Table 17 ANOVA Summary for Regression Analysis Predicting Sleep Disturbance From Interoceptive Awareness

Source	SS	df	MS	F	p
Regression	225.28	1	225.279	4.82	.030
Residual	7241.51	155	46.719		
Total	7466.79	156			

Note. N = 157. Dependent variable = Sleep Disturbance (SDA). Predictor = Interoceptive Awareness (MAIA-2).

The results from the ANOVA showed the regression model to be significant, F(1, 155) = 4.822, p = .030, proving interoceptive awareness significantly predicted sleep disturbance above the level of chance. This provides evidence that changes in interoceptive awareness are associated with corresponding changes in the scores of sleep disturbance.

IV. DISCUSSION

➢ *Introduction*

The role of interoceptive awareness in predicting the regulation of emotions and quality of sleep in young adults is the focus of the current study. This section discusses the findings of the research and interprets the results in light of existing psychological theories and empirical literature.

➢ *Discussion of Demographic Findings*

Demographic analysis confirmed that the study sample consisted of participants aged 18–30 years. This sample certainly includes developmental homogeneity since the study sample collected data during young adulthood. This age range includes the developmental section of the lifespan, where there are large emotional fluctuations, significant stress, and sleep patterns that are disordered. The inclusion of both genders and different educational and work backgrounds improved the study's validity. It also enabled a wider interpretation of psychological processes in everyday life.

➢ *Interoceptive Awareness and Emotion Regulation*

In the correlation analysis, the variables interoceptive awareness (MAIA-2) and emotion regulation (ERQ) correlated positively and significantly (r = .274, p = .001). These findings are consistent with Hypothesis 1, suggesting that effective emotion regulation involves more awareness of internal bodily sensations.

This result is consistent with the theoretical underpinnings of current interoceptive models that highlight the importance of bodily awareness when it comes to the processing of emotions and self-regulation. Those with high interoceptive awareness are able to detect and accurately interpret emotion-evoking physiological cues and adaptively respond to their emotions. Young adults who are more aware of their internal bodily signals might be better able to recognize emotional arousal early. They can then use suitable regulation strategies before emotions escalate.

➢ *Interoceptive Awareness and Sleep Disturbance*

The correlation analyses showed a significant negative relationship between interoceptive awareness and sleep disturbance (r = −.174, p = .030), supporting Hypothesis 2. Participants with higher interoceptive awareness reported lower levels of sleep disturbance, suggesting better sleep quality. The consistency of this inverse relationship across parametric and non-parametric analyses improves confidence in the strength of the finding. This result connects with theories that link interoceptive awareness to physical regulation and balance. Sleep is a complex process that relies on managing arousal, stress, and autonomic functioning. Individuals who are more aware of bodily sensations may better recognize early signs of physiological or emotional issues that disrupt sleep, such as tension, restlessness, or increased arousal. They may take actions that help them relax and fall asleep. The relatively small effect size indicates that

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sleep disturbance is affected by various factors. Still, the significant connection shows that interoceptive awareness is an important factor in sleep health among young adults. This finding adds to the growing research highlighting mind-body awareness as a key factor in sleep quality.

➢ *Emotion Regulation and Sleep Disturbance*

Correlational analysis indicated a statistically significant negative association between emotional control and sleep disturbance ($r = -.204$, $p = .010$), thus confirming the relationship between emotional regulation and the quality of sleep. Participants who reported greater sleep disturbance, reported greater difficulty controlling and regulating their emotional responses.

Research demonstrates the relationship between sleep and emotional functioning. Inadequate sleep positively correlates with greater emotional sensitivity, increased psychological anguish, and stress. Emotionally sensitive people generally experience difficulty controlling their emotions, and poor sleep may heighten emotional dysregulation, especially in young adults who are experiencing social, occupational, and academic stressors.

Although the correlation is small, the statistical significance illustrates the impact sleep disturbance has on emotional regulation. Given the complexity of emotion regulation, sleep disturbance is one of many contributing features.

➢ *Predictive Role of Interoceptive Awareness in Emotion Regulation*

Regression analysis showed that interoceptive awareness significantly predicted emotion regulation. It accounted for a modest but meaningful portion of variance in ERQ scores. Interoceptive awareness explained 7.5% of the variation in emotion control scores, based on the coefficient of determination ($R^2 = .075$). This finding supports Hypothesis 3 and builds on the correlational results by showing a directional predictive relationship. The predictive role of interoceptive awareness suggests that being aware of bodily sensations is not just linked to emotion regulation; it also plays an active role in it. Individuals who are more tuned into their internal bodily states may have better access to emotional cues and physiological feedback, helping them use more thoughtful and flexible regulation strategies. While the explained variance was limited, this is expected, given that emotion regulation is influenced by many factors, including cognitive, social, developmental, and contextual elements. Importantly, the significance of the regression model shows that interoceptive awareness independently contributes to emotional regulation beyond random chance. This reinforces its importance as a psychological concept for understanding emotional functioning in young adults.

➢ *Predictive Role of Interoceptive Awareness in Sleep Disturbance*

Hypothesis 4 states that sleep disturbances in young individuals would be predicted by interoceptive awareness. This hypothesis was confirmed through simple linear regression, which indicated interoceptive awareness had a statistically significant relationship with sleep disturbances ($R = .174$, $R^2 = .030$, Adjusted $R^2 = .024$, $p = .030$). Although there is a low amount of variance attributed, interoceptive awareness determines the amount of sleep disturbances.

From the results, we can infer that the relationship described in H4 is accurate, whereby interoceptive awareness is positively correlated with the amount of sleep disturbances. Though with a small effect size. Interoceptive awareness is not posited to be the sole factor in the quality of sleep. Sleep quality could be attributed to the underlying problem of sleep disturbances or interoceptive awareness, with the other factors being emotional, cognitive, physiological, behavioral, and even lifestyle.

➢ *Integration with Study Aims and Theoretical Implications*

Overall, the study's results are in accordance with its primary goals of evaluating the connections between emotion regulation, sleep quality, and interoceptive awareness. The results also show how theories that stress the significance of body awareness in emotion and body regulation have evolved. As a result, developing interoceptive awareness and emotion regulation skills can be a crucial psychological technique for raising emotional and sleep quality.

V. CONCLUSION

➢ *Summary of the Study*

This study sought to determine the extent to which young adults' interoceptive awareness may predict their ability to self-regulate emotions and their self-reported quality of sleep. It also attempted to integrate the psychological theories regarding bodily awareness as an essential element of emotional and physiological control and sought to develop an empirical body of predictive–correlational evidence to complement the existing literature in the area of mind–body awareness, emotional functioning, and sleep health.

A sample of 157 young adults (ages 18–30) who met specific and pre-defined inclusion criteria was taken. The research adhered to all pertinent ethical guidelines, and all participants provided voluntary, informed consent. Instruments used in data collection included the Multidimensional Assessment of Interoceptive Awareness–Version 2 (MAIA-2), the Emotion Regulation Questionnaire (ERQ), and the Sleep Disturbance–Adult (SDA) scale, all of which are standardized and validated.

The results of descriptive statistical analysis revealed low to moderate levels of interoceptive awareness and emotion regulation, along with higher sleep disturbance among participants, with enough variability in scores to allow for inferential analysis. To evaluate possible associations and predictive relationships among variables, Pearson's correlation analysis, followed by regression analysis, was performed for each interoceptive awareness, emotional regulation and sleep disturbance. The analyses facilitated a thorough understanding of interoceptive awareness,

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emotional regulation, and sleep disturbance variables, both relationally and in terms of direction.

➢ *Summary of Major Findings*

The results of the study yielded numerous notable outcomes. To begin with, interoceptive awareness was identified as positively and substantially linked with emotional regulation, suggesting that more awareness of internal bodily sensations translated to better regulation of emotions, thus supporting Hypothesis 1.

Second, interoceptive awareness was identified as negatively but substantially linked with sleep disturbances. Better sleep was linked to higher interoceptive awareness, which validated Hypothesis 2 and strengthened the consensus among theorists in the field that physiological awareness is a necessary component of a healthy sleep cycle.

Third, regression analysis showed that interoceptive awareness significantly predicted emotion regulation, explaining a sizeable proportion of variance in the emotion regulation scores. This finding corroborated Hypothesis 3 and recognized interoceptive awareness as an important predictor of emotional self-regulation.

Lastly, it was established that sleep disturbance had a predictive relationship, albeit weak, with interoceptive awareness. This finding suggested a two-way relationship between bodily awareness and sleep, reinforcing the linked psychological and physiological processes.

➢ *Limitations of the Study*

Despite its contributions, this study has some limitations that should be noted. First, the study used a cross-sectional design, which limits the ability to make causal connections between interoceptive awareness, emotion regulation, and sleep quality. Longitudinal or experimental designs would provide stronger evidence of directionality. Second, the study relied only on self-report measures, which may be influenced by social desirability bias. Objective physiological measures of interoception or sleep could enhance self-report data in future research. Third, the sample mainly included young adults with higher education levels, which may limit how the findings apply to older adults or people from various educational and socioeconomic backgrounds. Additionally, using convenience sampling restricts representativeness. The study also did not account for potential confounding factors such as stress levels, mental health history, caffeine use, or lifestyle that may affect emotion regulation and sleep.

➢ *Recommendations for Future Research*

In order to demonstrate causal links between interoceptive awareness, emotion regulation, and sleep quality, future research may use experimental or longitudinal designs. To improve methodological rigour, researchers are urged to incorporate objective measurements like physiological markers of interoception or actigraphy-based sleep evaluations. The findings would be more broadly applicable if the sample was expanded to include a range of age groups, clinical populations, and cultural backgrounds. The efficiency of interoception-based therapies, such as body-oriented psychotherapy, mindfulness training, or somatic awareness exercises, in enhancing emotion control and sleep quality may also be investigated in more detail. Analyzing other moderators or mediators, like stress, anxiety, or mindfulness, could provide a more comprehensive understanding of the mechanisms involved.

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