



Effect of Yogic Practices and Yogic Counselling on Body Mass Index Mean Arterial Pressure and Gastrointestinal Tolerance among Men with Binge Eating Disorder

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ABSTRACT

Background: Binge Eating Disorder (BED) is characterized by recurrent episodes of excessive food consumption accompanied by a perceived loss of control and without regular compensatory behaviours. Apart from psychological distress, BED is associated with adverse physiological consequences, including increased body mass index (BMI), cardiovascular risk and gastrointestinal disturbances. Yogic practices combined with yogic counselling may provide a holistic approach for addressing physiological dysregulation associated with BED.

Objective: The purpose of the study was to determine the effect of yogic practices and yogic counselling on Body Mass Index (BMI), Mean Arterial Pressure (MAP) and Gastrointestinal Tolerance among men with Binge Eating Disorder.

Methods: Thirty men with binge eating disorder, aged 18–25 years, were selected and randomly assigned to an experimental group (n = 15) and a control group (n = 15). The experimental group underwent a structured programme of yogic practices and yogic counselling for 12 weeks, six days per week, with each session lasting 1 hour and 15 minutes. The control group continued its normal routine without yogic intervention. BMI was determined using height and body weight, MAP was derived from systolic and diastolic blood pressure, and gastrointestinal tolerance was assessed using the Gastrointestinal Symptom Rating Scale (GSRS). Pre-test and post-test data were examined for normality using the Shapiro–Wilk test and analysed using Analysis of Covariance (ANCOVA), with the level of significance fixed at 0.05. Results: At baseline, there were no significant differences between the experimental and control groups in BMI, MAP and gastrointestinal tolerance. Following the 12-week intervention, the adjusted post-test BMI means were 27.79 kg/m² for the experimental group and 29.48 kg/m² for the control group, with an F-ratio of 43.19. Adjusted MAP means were 97.62 mmHg and 107.85 mmHg, respectively, with an F-ratio of 113.42. Adjusted gastrointestinal tolerance scores were 38.55 and 44.98, respectively, with an F-ratio of 85.45. All obtained adjusted F-ratios exceeded the critical F-value of 4.21 at the 0.05 level, indicating statistically significant intervention effects.

Conclusion: Twelve weeks of combined yogic practices and yogic counselling significantly improved BMI, MAP and gastrointestinal tolerance among men with BED. The findings indicate that a structured yoga-based intervention may serve as a useful complementary approach for improving metabolic, cardiovascular and gastrointestinal outcomes associated with binge eating disorder.

Keywords: Binge Eating Disorder, Yogic Practices, Yogic Counselling, Body Mass Index, Mean Arterial Pressure, Gastrointestinal Tolerance, Yoga.

1. Introduction

Binge Eating Disorder (BED) is an eating disorder characterized by recurrent episodes of consuming unusually large quantities of food within a limited period while experiencing a sense of loss of control over eating. Unlike bulimia nervosa, binge episodes in BED are not regularly followed by compensatory behaviours such as self-induced vomiting, fasting or excessive exercise (American Psychiatric Association, 2013; World Health Organization, 2018). Individuals with BED may eat more rapidly than usual, continue eating until uncomfortably full, eat large quantities despite the absence of physical hunger, eat alone because of embarrassment and subsequently experience guilt, shame or psychological distress. BED is increasingly recognized as an important health concern among men. Historically, eating disorder research has predominantly focused on women, which may have contributed to under-recognition and delayed identification of eating disorders in male populations. BED is particularly important in this context because its gender distribution is more balanced than that of anorexia nervosa and bulimia nervosa. The consequences of BED extend beyond disturbed eating behaviour. Recurrent excessive energy intake and loss-of-control eating can contribute to increased body weight and BMI, while

chronic psychological stress and obesity-related factors may negatively influence cardiovascular functioning. Gastrointestinal complaints, including bloating, indigestion, abdominal discomfort, reflux and altered bowel habits, may also accompany recurrent binge eating.

Body Mass Index is an anthropometric indicator of body weight relative to height and provides a practical measure for monitoring changes in weight status. BED is frequently associated with overweight and obesity, making BMI an important physiological outcome when evaluating interventions designed to improve eating behaviour and metabolic health. Mean Arterial Pressure represents the average arterial pressure throughout a cardiac cycle and provides an indication of cardiovascular regulation and tissue perfusion (DeMers & Wachs, 2023). BED may coexist with obesity, chronic stress, emotional dysregulation and disturbed autonomic functioning, all of which can increase cardiovascular burden. Consequently, MAP provides a relevant physiological marker for examining whether a mind–body intervention influences cardiovascular regulation. Gastrointestinal functioning is another important consideration in BED. Rapid and excessive food consumption can contribute to bloating, abdominal discomfort, indigestion, reflux and disturbances in bowel function. The brain–gut axis also provides an important physiological pathway through which psychological stress and autonomic imbalance may influence gastrointestinal symptoms.

Yoga represents a multidimensional mind–body approach incorporating physical postures, regulated breathing, relaxation, meditation, awareness and lifestyle regulation. Evidence suggests that yoga may contribute to improved body composition and metabolic functioning in individuals with overweight or obesity (Batrakoulis, 2022; Caldwell et al., 2021). Yoga-based interventions have also demonstrated favourable effects on cardiovascular parameters and autonomic regulation (Anjana et al., 2022; Ahuja et al., 2024). Similarly, mind–body approaches have received increasing attention in gastrointestinal health because of their potential effects on stress regulation, parasympathetic activity and brain–gut interaction (Islam et al., 2022; Craven & Thakur, 2024). Yogic counselling complements physical yogic practices by encouraging self-awareness, behavioural regulation, mindfulness, lifestyle discipline and adaptive responses to emotional experiences. In individuals with BED, combining yogic practices with counselling may therefore address both physiological manifestations and behavioural processes associated with uncontrolled eating.

Against this background, the present study examined the effects of a structured 12-week programme of yogic practices and yogic counselling on BMI, MAP and gastrointestinal tolerance among men with BED.

2. Objective

The objective of the study was to determine the effect of yogic practices and yogic counselling on selected physiological variables, namely Body Mass Index, Mean Arterial Pressure and Gastrointestinal Tolerance, among men with Binge Eating Disorder.

3. Hypothesis

It was hypothesized that there would be significant improvement in Body Mass Index, Mean Arterial Pressure and Gastrointestinal Tolerance among men with Binge Eating Disorder following participation in a structured programme of yogic practices and yogic counselling.

4. Methodology

4.1. Research design

The study employed a two-group pre-test–post-test random group experimental design. The independent variable was the structured programme of yogic practices and yogic counselling, while BMI, MAP and gastrointestinal tolerance constituted the physiological dependent variables examined in the present article.

4.2. Participants

Participants were identified using the standardized Eating Disorder Inventory (EDI) (Ramachanthiran K & Selvalakshmi S, 2025). From the eligible men identified with Binge Eating Disorder, a total of 30 participants residing in Chennai and aged 18–25 years were selected for the study. The selected participants were randomly assigned to two equal groups: an Experimental Group (n = 15) and a Control Group (n = 15). The Experimental Group received yogic practices and yogic counselling, while the Control Group continued their regular daily routine without yogic intervention.

Participants were required to be physically fit, medically cleared for yoga participation, and willing to complete the 12-week intervention and pre-test/post-test assessments. Individuals with medical, musculoskeletal, cardiovascular, or neurological conditions restricting yoga practice; those undergoing ongoing psychiatric or psychological therapy for eating disorders; regular yoga practitioners during the preceding six months; and individuals with recent surgery, acute injury, or illness that could compromise safe participation were excluded. Written informed consent was obtained from all participants before group allocation.

4.3. Intervention

The Experimental Group underwent a structured programme of yogic practices and yogic counselling for 12 weeks, six days per week, from 6:00 a.m. to 7:15 a.m., with each session lasting 75 minutes. The intervention was divided into two progressive phases of six weeks each and included

preparatory and loosening exercises, asanas, pranayama, mudras, Om chanting, relaxation, Yoga Nidra, mindfulness meditation, and yogic counselling. Attendance was recorded regularly. The Control Group continued their normal routine and underwent the same pre-test and post-test assessment procedures.

4.4. Assessment of body mass index

Height was measured using a standard stadiometer, and body weight was measured using a calibrated digital weighing scale. Participants removed footwear and heavy accessories before assessment. Height was recorded to the nearest 0.1 cm and weight to the nearest 0.1 kg. Body Mass Index (BMI) was calculated using the following formula:

$$\text{BMI} = \text{Body weight (kg)} / \text{Height}^2 (\text{m}^2)$$

BMI was expressed in kg/m^2 . BMI values were interpreted as follows: below 18.5 kg/m^2 as underweight, $18.5\text{--}24.9 \text{ kg/m}^2$ as normal range, $25.0\text{--}29.9 \text{ kg/m}^2$ as overweight, and 30.0 kg/m^2 or above as obesity (World Health Organization [WHO], 2000).

4.5. Assessment of mean arterial pressure

Blood pressure was measured using a calibrated digital sphygmomanometer. Participants rested in a seated position for at least five minutes, with their backs supported and feet placed flat on the floor. The cuff was positioned around the upper arm at heart level. Participants were instructed to remain still and avoid speaking during measurement. Systolic Blood Pressure (SBP) and Diastolic Blood Pressure (DBP) were recorded in mmHg. Mean Arterial Pressure (MAP) was calculated using the formula: $\text{MAP} = \text{DBP} + 1/3 (\text{SBP} - \text{DBP})$

MAP was expressed in mmHg. For interpretation, MAP values of 70 mmHg or above were considered indicative of adequate organ perfusion, values above 100 mmHg were considered suggestive of elevated arterial pressure, and values below 70 mmHg were considered indicative of possible low perfusion.

4.6. Assessment of gastrointestinal tolerance

Gastrointestinal Tolerance was assessed using the **Gastrointestinal Symptom Rating Scale (GSRS)**. The instrument assesses gastrointestinal symptoms such as abdominal discomfort, bloating, indigestion, reflux, and disturbances related to bowel functioning. The GSRS consists of 15 items rated on a seven-point severity scale. Individual item scores were summed to obtain a total score ranging from 15 to 105. Higher scores indicated greater gastrointestinal distress, whereas lower scores indicated better gastrointestinal tolerance and digestive functioning (Svedlund et al., 1988).

4.7. Reliability

During the pilot phase, repeated measurements were conducted under standardized conditions. The Intraclass Correlation Coefficient was 0.91 for BMI, 0.89 for MAP and 0.90 for gastrointestinal tolerance, indicating high measurement reliability.

4.8. Statistical analysis

Normality was examined using the Shapiro–Wilk test. All selected variables produced p -values greater than 0.05, supporting the use of parametric statistical procedures. Analysis of Covariance (ANCOVA) was subsequently employed to compare the experimental and control groups while statistically controlling for baseline scores. Statistical significance was fixed at $\alpha = 0.05$. The critical F -values were 4.20 for $df(1, 28)$ and 4.21 for $df(1, 27)$.

5. Results

The statistical outcomes of Body Mass Index.

Table 1

ANALYSIS OF COVARIANCE ON BODY MASS INDEX (BMI) (Scores in kg/m^2)

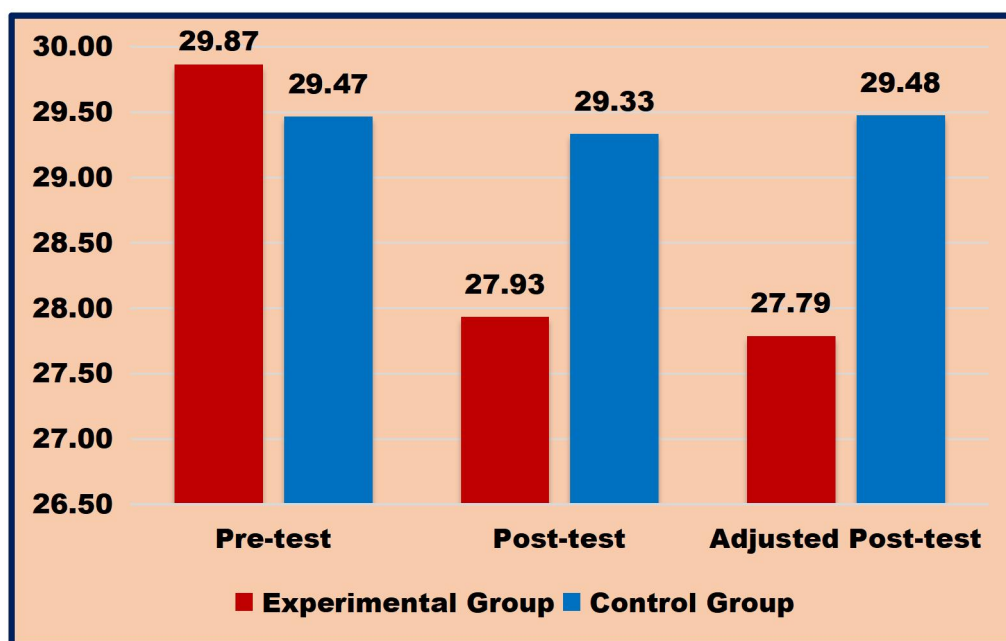
Test	Group	Mean	Source of Variance	Sum of Squares	df	Mean Square	Obtained F Ratio
Pre-test	Experimental	29.87	Between	1.20	1	1.20	0.74
	Control	29.47	Within	45.47	28	1.62	
Post-test	Experimental	27.93	Between	14.70	1	14.70	11.35*

Test	Group	Mean	Source of Variance	Sum of Squares	df	Mean Square	Obtained F Ratio
	Control	29.33	Within	36.27	28	1.29	
Adjusted Post-test	Experimental	27.79	Between	20.78	1	20.78	43.19*
	Control	29.48	Within	13.0	27	0.48	

Table F-value (1, 28) = 4.20 & (1, 27) = 4.21

*Significant at 0.05 level

Figure – 1

Bar Diagram Showing Pre-test, Post-test and Adjusted Post-test Mean Values of BMI (Scores in kg/m²)

The statistical outcomes of Mean Arterial Pressure.

Table 2

ANALYSIS OF COVARIANCE ON MEAN ARTERIAL PRESSURE (MAP) (Scores in mmHg)

Test	Group	Mean	Source of Variance	Sum of Squares	df	Mean Square	Obtained F Ratio
Pre-test	Experimental	108.13	Between	2.13	1	2.13	0.12
	Control	108.67	Within	483.07	28	17.25	
Post-test	Experimental	97.47	Between	832.13	1	832.13	67.78*
	Control	108.00	Within	343.73	28	12.28	
Adjusted Post-test	Experimental	97.62	Between	781.22	1	781.22	113.42*
	Control	107.85	Within	186.0	27	6.89	

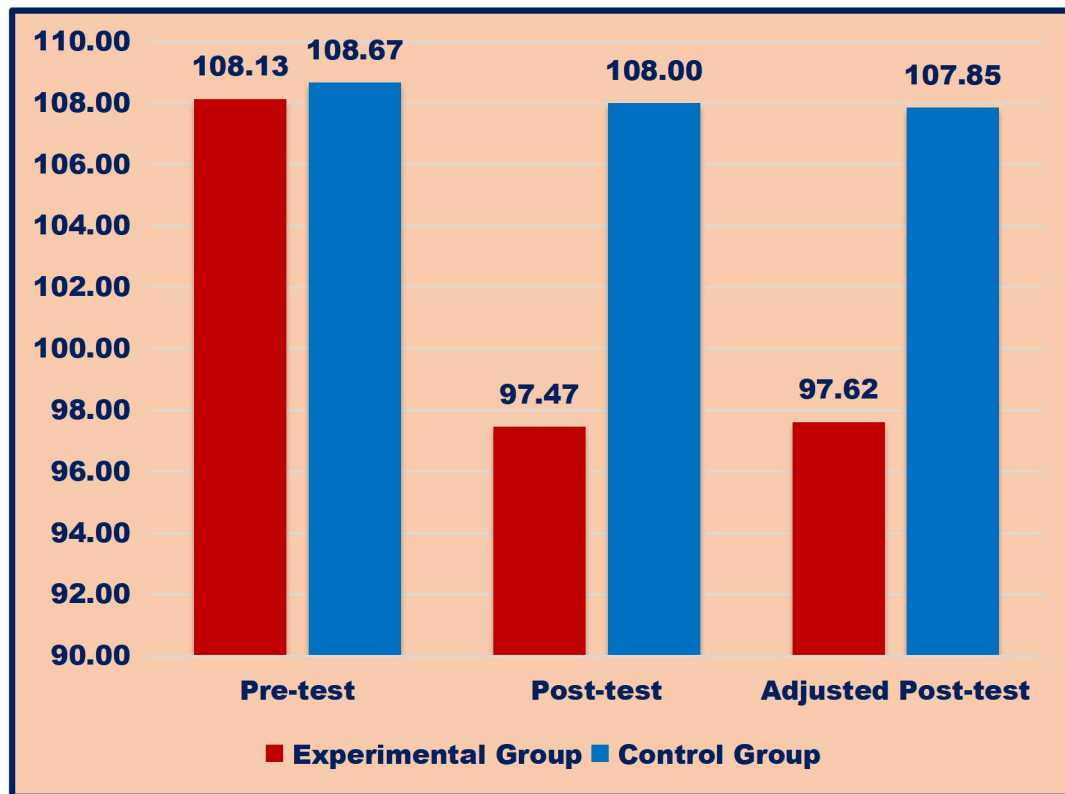
Table F-value (1, 28) = 4.20 & (1, 27) = 4.21

*Significant at 0.05 level

Figure – 2

Bar Diagram Showing Pre-test, Post-test and Adjusted Post-test Mean Values of Mean Arterial Pressure (MAP)

(Scores in mmHg)



The statistical outcomes of Gastrointestinal Tolerance.

Table 3

ANALYSIS OF COVARIANCE ON GASTROINTESTINAL TOLERANCE (Scores in Numbers)

Test	Group	Mean	Source of Variance	Sum of Squares	df	Mean Square	Obtained F Ratio
Pre-test	Experimental	46.00	Between	12.03	1	12.03	1.38
	Control	44.73	Within	244.93	28	8.75	
Post-test	Experimental	39.00	Between	229.63	1	229.63	29.80*
	Control	44.53	Within	215.73	28	7.70	
Adjusted Post-test	Experimental	38.55	Between	295.45	1	295.45	85.45*
	Control	44.98	Within	93.4	27	3.46	

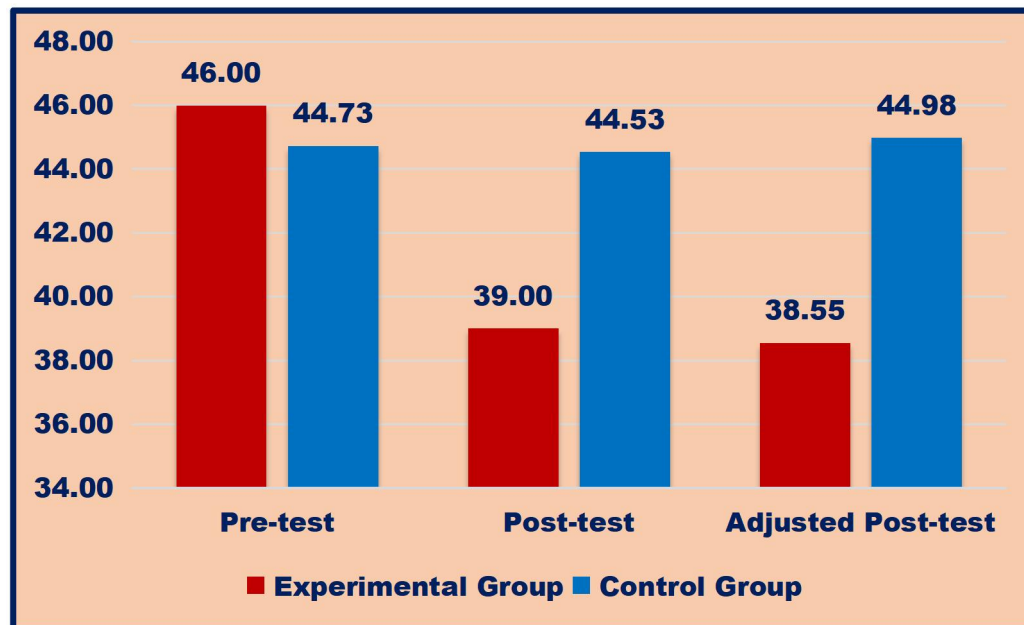
Table F-value (1, 28) = 4.20 & (1, 27) = 4.21

*Significant at 0.05 level

Figure – 3

Bar Diagram Showing Pre-test, Post-test and Adjusted Post-test Mean Values of Gastrointestinal Tolerance

(Scores in Numbers)



6. Discussion

The findings demonstrated statistically significant improvements in Body Mass Index, Mean Arterial Pressure and Gastrointestinal Tolerance following the 12-week intervention compared with the control group. These results suggest that combining yogic practices with yogic counselling may offer physiological benefits among young adult men with BED.

6.1. Body mass index

The experimental group demonstrated a decrease in BMI from 29.87 kg/m² at pre-test to 27.93 kg/m² at post-test, while comparatively little change occurred in the control group. The adjusted means of 27.79 kg/m² and 29.48 kg/m² for the experimental and control groups, respectively, with an F-ratio of 43.19, indicated a statistically significant difference after controlling for baseline scores.

The observed reduction is consistent with evidence suggesting that structured yoga programmes may positively influence body composition and weight-related outcomes. Ghosh and Mukherjee (2023) reported improvements in BMI following a Hatha Yoga programme among individuals with obesity. Similarly, Na Nongkhai et al. (2021) demonstrated favourable changes in body composition following continuous yoga practice among obese adolescents.

Jain et al. (2022) reported beneficial effects of a comprehensive yoga programme on weight reduction among children and adolescents with obesity. Batrakoulis (2022), in a review of psychophysiological adaptations to yoga among overweight and obese populations, also highlighted the potential role of yoga in obesity management.

Several factors may have contributed to the BMI changes observed in the present study. Regular yogic practices provided structured physical activity, while breathing practices, relaxation, meditation, and yogic counselling may have supported stress management and greater awareness of behavioural and eating patterns. For individuals with BED, in whom emotional and uncontrolled eating may contribute to excessive energy intake, the integration of physical practices with yogic counselling may be particularly relevant.

6.2. Mean arterial pressure

A significant improvement was observed in MAP. The experimental group's mean decreased from 108.13 mmHg at pre-test to 97.47 mmHg at post-test, whereas the control group changed only slightly from 108.67 mmHg to 108.00 mmHg. After adjustment for baseline scores, the experimental and control group means were 97.62 mmHg and 107.85 mmHg, respectively, with an F-ratio of 113.42, indicating a statistically significant difference between the groups.

These findings are consistent with research demonstrating the cardiovascular benefits associated with yoga. Anjana et al. (2022) reported reductions in systolic and diastolic blood pressure following Om chanting and Yoga Nidra among individuals with hypertension. Ahuja et al. (2024), in a systematic review and meta-analysis, similarly identified beneficial effects of Yoga Nidra on blood pressure.

Chaudhary et al. (2022) compared yoga and walking exercise in young adults and reported favourable cardiac effects associated with yoga. Pattamukkil et al. (2023) also reviewed evidence concerning yoga and vascular outcomes, while Raj et al. (2023) reported an association between yoga participation and favourable arterial stiffness characteristics.

The reduction in MAP observed in the present study may be related to the integrated nature of the intervention. Asanas, pranayama, Yoga Nidra, mindfulness meditation, and relaxation practices may support psychophysiological relaxation and autonomic regulation. Reduced physiological arousal and stress may, in turn, contribute to favourable cardiovascular responses. Yogic counselling may provide an additional behavioural component by supporting emotional regulation and healthier lifestyle patterns. However, these potential mechanisms were not directly measured in the present study and therefore require further investigation.

6.3. Gastrointestinal tolerance

Gastrointestinal tolerance also improved significantly. The experimental group's GSRS score decreased from 46.00 at pre-test to 39.00 at post-test, whereas the control group remained relatively unchanged. After adjustment for baseline scores, the means were 38.55 and 44.98 for the experimental and control groups, respectively, with an F-ratio of 85.45.

The direction of this change is important because higher GSRS scores represent greater gastrointestinal symptom severity. Therefore, the lower score observed following the intervention indicates reduced gastrointestinal symptoms and improved gastrointestinal tolerance.

Svedlund et al. (1988) established the GSRS as a clinical instrument for assessing gastrointestinal symptoms. The present findings are also supported by Singh and Ghildiyal (2021), who discussed the role of yoga in gastrointestinal disorders and constipation. Yoga practices involving body movements, stretching, relaxation, and regulated breathing may contribute to improved gastrointestinal functioning.

Islam et al. (2022) highlighted the relevance of mind-body interventions in conditions involving gastrointestinal symptoms and emphasized the relationship between psychological stress and gastrointestinal functioning. Craven and Thakur (2024) similarly discussed complementary and integrative approaches within the whole-person management of gastrointestinal disorders.

The improvement observed in the present study may therefore reflect the combined influence of physical yogic practices, relaxation, regulated breathing, and psychological stress reduction. In individuals with BED, gastrointestinal symptoms may be associated with eating behaviour as well as psychological and physiological factors. Yogic counselling may complement the physical practices by promoting greater awareness of eating behaviour, emotional responses, and lifestyle patterns. These possible explanatory mechanisms should, however, be interpreted cautiously because they were not directly evaluated in the present study.

7. Conclusion

The study demonstrated that a 12-week programme of yogic practices and yogic counselling significantly improved Body Mass Index, Mean Arterial Pressure and Gastrointestinal Tolerance among men with BED compared with the control group. These findings suggest that the combined intervention may serve as a complementary approach for improving selected physiological outcomes. However, the small sample size, restricted age range, absence of an active control intervention and lack of long-term follow-up limit generalizability. Further studies involving larger and more diverse populations are recommended.

8. Ethical considerations

Informed consent was obtained from all participants before participation. Confidentiality, voluntary participation, and the right to withdraw were ensured throughout the study. Appropriate institutional permission was obtained before data collection.

9. Conflict of interest

The authors declare that there is no conflict of interest related to the conduct, authorship or publication of this study.

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