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Comparison of the Effectiveness of Hatha Yoga and Mindfulness Exercises on Generalized Anxiety and Existential Anxiety in Young Men in Kermanshah

Farhad Mahidashti¹, Zeinab Mihandoost²*, Homeira Soleimannejad³

1. PhD Student, Department of Psychology, Ilam Branch, Islamic Azad University, Ilam, Iran.

2. Assistant Professor, Department of Psychology, Ilam Branch, Islamic Azad University, Ilam, Iran (Corresponding author).

3. Assistant Professor, Department of Psychology, Ilam Branch, Islamic Azad University, Ilam, Iran.

* Corresponding author email address: mihandost@ilam-iau.ac.ir

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ABSTRACT

Purpose: The aim of the present study was to compare the effectiveness of Hatha Yoga exercises and mindfulness-based therapy on generalized anxiety and existential anxiety in physically active and inactive men aged 30 to 50 years in the city of Kermanshah.

Methods and Materials: This study employed a quasi-experimental design with a pre-test, post-test, and a 2-month follow-up period, along with a control group. The statistical population included all men aged 30 to 50 years who had enrolled in yoga classes in Kermanshah during the winter of 2023. The research sample consisted of 45 individuals selected through convenience sampling and randomly assigned to experimental groups (Hatha Yoga exercises and mindfulness-based therapy) and a control group. Participants completed the Generalized Anxiety Disorder questionnaire by Spitzer et al. (2006) and the Existential Anxiety questionnaire by Lawrence Good (1974) during the pre-test, post-test, and follow-up phases. Participants in the Hatha Yoga and mindfulness-based therapy groups underwent eight 90-minute training sessions, conducted once a week. Data were analyzed using SPSS version 27.

Findings: The results indicated that both Hatha Yoga exercises and mindfulness-based therapy led to improvements in generalized anxiety and existential anxiety in physically active and inactive men aged 30 to 50 years in Kermanshah during the post-test and follow-up phases ($P < 0.05$). Furthermore, no significant difference was found between Hatha Yoga exercises and mindfulness-based therapy ($P > 0.001$).

Conclusion: Based on the findings, it can be concluded that both Hatha Yoga exercises and mindfulness-based therapy are effective approaches in improving generalized anxiety and existential anxiety.

Keywords: Generalized Anxiety, Existential Anxiety, Mindfulness, Hatha Yoga.

1. Introduction

According to the World Health Organization, from 2010 to 2020, men were slightly more physically active than women globally, with fewer than 1.2% of men aged 18 to 64 being sufficiently active (Eichstadt et al., 2020). Given that men are unlikely to engage in physical activity unless they find it enjoyable, prospective studies in middle-aged adults indicate a correlation between anxiety levels and aging (Ferreira et al., 2024). Anxiety is a prevalent issue in modern societies, particularly among men (Reis et al., 2023).

Anxiety is a natural reaction to daily stress and concerns; however, when it becomes severe and persistent, it can evolve into a serious problem (Zare Zadegan et al., 2023). Anxiety is an integral part of human life and exists in all individuals at varying degrees, acting as an adaptive response to different life situations. However, excessive anxiety can develop into a pathological condition. Generalized anxiety disorder (GAD) is among the most common psychiatric disorders, characterized by persistent worry about potential future events. This excessive concern leads to chronic and maladaptive anxiety regarding life events. The term "worry" refers to an individual's cognitive tendency to continually think about a particular issue and their inability to let go of it. Such worry is usually persistent, as individuals struggle to find a resolution. While everyone experiences worry to some extent and may even find it beneficial in coping with difficult situations, individuals with GAD worry excessively about a wide range of issues, which is why the disorder is termed "generalized." For these individuals, worry becomes paralyzing and a source of intense emotional distress (Rahmatinia & Gorji, 2023).

Recent studies have highlighted the high prevalence of anxiety among both athletes (Mangolo et al., 2021; Sanfilippo et al., 2023) and non-athletes (Cudo et al., 2024; Hartman et al., 2023).

On the other hand, despite remarkable advancements in various fields such as culture, society, economy, and politics that are expected to facilitate life (Dinarvand et al., 2020), it appears that physical inactivity and the neglect of physical and mental health among middle-aged men—who juggle multiple social roles—have led to a loss of their true identity and alienation from their authentic selves. This existential confusion and sense of meaninglessness contribute to the development of existential anxiety (Borjali et al., 2017). Existential anxiety negatively impacts health (Gasiorowska et al., 2018) and typically arises from hopelessness,

alienation, and feelings of emptiness, which become more pronounced in young and middle-aged adults as they contemplate the purpose of life (Shirali & Dasht Bozorgi, 2019). This type of anxiety pervades life, encompassing concerns about death and nonexistence, the loss of life's meaning, and feelings of guilt and regret (Temple & Gall, 2018). Researchers argue that existential anxiety arises when individuals deeply reflect on their existence, leading to thoughts and emotions related to freedom and responsibility, which compel them to seek meaning and authentic living. Failure to achieve this can result in alienation and isolation (Faghih & Hadipour, 2024).

Several methods have been proposed to alleviate generalized and existential anxiety, including cognitive, metacognitive, and neurofeedback interventions (Dinarvand et al., 2020; Salama et al., 2022; Sharafi et al., 2023). However, these interventions have certain limitations, such as the formal nature of the treatment process, reluctance to accept mental health diagnoses, high treatment costs, prolonged duration, and limited accessibility. Despite research efforts, there is no conclusive evidence suggesting whether Hatha Yoga exercises are more effective than mindfulness-based therapy in managing generalized and existential anxiety or vice versa. This gap in the literature necessitates further investigation.

Thus, the primary research question is: Is there a significant difference between the effectiveness of Hatha Yoga exercises and mindfulness-based therapy in reducing generalized and existential anxiety in physically active and inactive men aged 30 to 50 years in Kermanshah?

2. Methods and Materials

2.1. Study Design and Participants

This study is applied in terms of its objectives and quasi-experimental in terms of data collection methods. The present study follows a quasi-experimental design with a pre-test, post-test, and a two-month follow-up period, along with a control group.

In this study, physically active and inactive men aged 30 to 50 years in Kermanshah were randomly assigned to three groups (two experimental groups and one control group). Different interventions were applied to the two experimental groups, while the control group was placed on a waiting list for intervention. All participants in the three groups were assessed at the pre-test, post-test, and follow-up stages after two months.

The statistical population of this study included all men aged 30 to 50 years who had enrolled in yoga classes in Kermanshah during the winter of 2023. A total of 45 individuals were randomly selected and assigned to three groups of 15 (two experimental groups and one control group). Regarding the number of participants in each group, it is suggested that group counseling sessions consist of 7 to 10 participants.

In this study, data collection was conducted using two methods: first, a library research method, and second, a field research method, which involved distributing three questionnaires: (1) the seven-item Generalized Anxiety Disorder Questionnaire by Spitzer et al. (2006), (2) the Existential Anxiety Questionnaire by Lawrence Good (1974), and (3) a demographic questionnaire, among physically active and inactive men aged 30 to 50 years in Kermanshah.

2.2. Measures

The Generalized Anxiety Disorder Questionnaire was developed by Spitzer, Kroenke, Williams, and Löwe (2006) to assess generalized anxiety disorder in individuals. This questionnaire consists of seven items and is scored on a Likert scale, with items such as "Feeling afraid as if something terrible might happen." The total score ranges from 0 to 21. The reliability and validity of this questionnaire were reported using Cronbach's alpha coefficient ($\alpha = .92$), test-retest reliability ($r = .83$), and convergent validity with the Beck Anxiety Inventory and the anxiety subscale of the Symptom Checklist-90 (SCL-90), which were reported as .72 and .74, respectively (Spitzer et al., 2006). In Iran, the reliability and validity of this scale were confirmed by Nainian et al., with Cronbach's alpha coefficient of .85, item-total correlations ranging from .34 to .53, and diagnostic validity of 87.5% (Arablou, 2023; Dinarvand et al., 2020; Sharafi et al., 2023). In the present study, the reliability was calculated using Cronbach's alpha coefficient and found to be .79.

The Existential Anxiety Questionnaire by Lawrence Good was designed and validated by Lawrence and Katrina Good (1974) to assess existential anxiety based on the components of hopelessness, alienation, feelings of emptiness, and meaninglessness. This questionnaire consists of 32 items and measures existential anxiety. The items are scored on a dichotomous (true/false) scale, with a scoring system of 0 and 1. Holt (1994) demonstrated in his research that this questionnaire has satisfactory convergent and

divergent validity with purpose-in-life tests, goal pursuit scales, and depression measures, with an overall correlation of .66, indicating high construct validity (Ars, Simmons, Stein, Winkelman et al., 2009). Ars et al. (2009) also reported that the validity of this scale was confirmed by correlating it with the anxiety, depression, and anger subscales of the General Health Questionnaire. In Iran, Adel (2015) validated this questionnaire using Cronbach's alpha method, with an obtained alpha of .874. The internal consistency of the questionnaire using the split-half method was .72 for the first half and .86 for the second half (Faghih & Hadipour, 2024; Shiralilari & Dasht Bozorgi, 2019). In the present study, the reliability was calculated using Cronbach's alpha coefficient and found to be .86.

2.3. Intervention

The intervention methods in this study included two approaches: Hatha Yoga exercises and mindfulness-based therapy, with the educational-therapeutic session protocols detailed below.

Hatha Yoga Exercises: The Hatha Yoga training program consisted of 90-minute sessions conducted over eight weeks, with one session per week, as follows:

- **Session 1:** A series of Pawanmuktasana (joint loosening and stretching movements).
- **Session 2:** Tadasana (Mountain Pose), Tiryaka Tadasana (Standing Side Bend), Vrksasana (Tree Pose), Utkatasana (Chair Pose), Natarajasana (Dancer Pose), Trikonasana (Triangle Pose), Parsvakonasana (Extended Side Angle Pose), Virabhadrasana1 (Warrior 1), Virabhadrasana2 (Warrior 2), Uttanasana (Standing Forward Bend), Parsvottanasana (Pyramid Pose), Prasarita Padottanasana (Wide-Legged Forward Bend), Parivrtta Trikonasana (Revolved Triangle Pose), Dandasana (Staff Pose), Baddhakonasana (Butterfly Pose), Paripurnanavasana (Boat Pose), Paschimottanasana (Seated Forward Bend), Janu Sirsasana (Head-to-Knee Forward Bend), Upavistha Konasana (Wide-Angle Seated Forward Bend).
- **Session 3:** Surya Namaskar (Sun Salutation).
- **Session 4:** Savasana (Corpse Pose).

Mindfulness-Based Therapy: This intervention was based on the Kabat-Zinn (2003) protocol and consisted of eight 90-minute group sessions, conducted once a week. In the first session, participants were introduced to the concept

of mindfulness, its principles, and its potential benefits. They were guided through basic mindfulness exercises, including mindful breathing and body awareness, to develop their ability to focus on the present moment without judgment. Psychoeducation about stress, anxiety, and the role of mindfulness in managing them was also provided. The second session focused on cultivating awareness of bodily sensations through a body scan meditation, which helped participants connect with their physical experiences and recognize areas of tension. The importance of self-compassion and acceptance was emphasized, and participants were encouraged to practice the body scan exercise at home. The third session introduced mindful movement exercises, such as gentle yoga, to encourage an awareness of movement and posture while fostering a connection between the mind and body. Participants were guided to practice movement with full attention and awareness, reducing automatic pilot behaviors that contribute to stress and anxiety. In the fourth session, participants explored mindfulness of thoughts and emotions, learning to observe their thoughts without becoming overwhelmed by them. They were taught techniques such as labeling thoughts and practicing non-reactivity to reduce rumination and negative self-talk. The fifth session emphasized mindful communication, where participants practiced active listening and responding with awareness rather than reacting impulsively. This session aimed to enhance interpersonal relationships and reduce social stress. In the sixth session, participants engaged in mindfulness of daily activities, incorporating mindfulness into routine behaviors such as eating, walking, and working to develop a consistent mindfulness practice beyond formal meditation sessions. They learned to bring mindful attention to their daily lives and identify habitual patterns that contribute to

anxiety. The seventh session focused on coping with challenges and stressors mindfully, teaching participants how to apply mindfulness skills during difficult moments, accept uncertainty, and maintain equanimity. Cognitive defusion techniques were introduced to help participants create distance from distressing thoughts. Finally, in the eighth session, participants reflected on their mindfulness journey, consolidated their learning, and developed personalized plans for maintaining long-term mindfulness practice. They were encouraged to integrate mindfulness into their lives continuously and utilize it as a tool for managing anxiety and enhancing overall well-being. Throughout the program, participants were assigned home practice exercises, such as daily mindfulness meditation, journaling their experiences, and engaging in reflective discussions during sessions to reinforce their learning and encourage active engagement with the intervention.

2.4. Data Analysis

To prepare the collected data for testing the research hypotheses, descriptive statistics, including central tendency indicators (frequency, mean, and standard deviation), were initially used. To analyze the research hypotheses, repeated measures analysis of covariance (ANCOVA) and Bonferroni post-hoc tests were applied. The data were analyzed using SPSS version 27. All tests were conducted at a significance level of $P < 0.05$.

3. Findings and Results

Table 1 presents the descriptive statistics, including the mean and standard deviation of generalized anxiety scores for participants across the three stages: pre-test, post-test, and follow-up.

Table 1

Descriptive Statistics for Generalized Anxiety

Group	Test Stage	Mean	Standard Deviation
Hatha Yoga	Pre-test	16.933	1.533
	Post-test	6.466	1.684
	Follow-up	6.266	1.576
Mindfulness	Pre-test	17.066	1.162
	Post-test	6.000	1.558
	Follow-up	5.600	1.502
Control	Pre-test	16.600	1.764
	Post-test	16.133	2.166
	Follow-up	16.666	2.023

The mean and standard deviation in the pre-test stage of generalized anxiety were ($M = 16.933$, $SD = 1.533$) for the Hatha Yoga group, ($M = 17.066$, $SD = 1.162$) for the Mindfulness group, and ($M = 16.600$, $SD = 1.764$) for the Control group. In the post-test stage, the mean and standard deviation were ($M = 6.466$, $SD = 1.684$) for the Hatha Yoga group, ($M = 6.000$, $SD = 1.558$) for the Mindfulness group, and ($M = 16.133$, $SD = 2.166$) for the Control group. In the follow-up stage, the mean and standard deviation were ($M =$

6.266 , $SD = 1.576$) for the Hatha Yoga group, ($M = 5.600$, $SD = 1.502$) for the Mindfulness group, and ($M = 16.666$, $SD = 2.023$) for the Control group. The comparison of means across different measurement stages indicates that generalized anxiety decreased in both the Hatha Yoga and Mindfulness groups in the post-test stage and remained relatively stable in the follow-up stage. However, no significant changes were observed in the Control group across the three stages.

Table 2

Descriptive Statistics for Existential Anxiety

Group	Test Stage	Mean	Standard Deviation
Hatha Yoga	Pre-test	24.600	1.242
	Post-test	9.733	1.980
	Follow-up	9.066	1.437
Mindfulness	Pre-test	25.533	2.030
	Post-test	8.666	1.799
	Follow-up	7.800	0.941
Control	Pre-test	24.266	1.667
	Post-test	23.266	1.907
	Follow-up	24.133	1.597

The mean and standard deviation in the pre-test stage of existential anxiety were ($M = 24.600$, $SD = 1.242$) for the Hatha Yoga group, ($M = 25.533$, $SD = 2.030$) for the Mindfulness group, and ($M = 24.266$, $SD = 1.667$) for the Control group. In the post-test stage, the mean and standard deviation were ($M = 9.733$, $SD = 1.980$) for the Hatha Yoga group, ($M = 8.666$, $SD = 1.799$) for the Mindfulness group, and ($M = 23.266$, $SD = 1.907$) for the Control group. In the follow-up stage, the mean and standard deviation were ($M = 9.066$, $SD = 1.437$) for the Hatha Yoga group, ($M = 7.800$, $SD = 0.941$) for the Mindfulness group, and ($M = 24.133$,

$SD = 1.597$) for the Control group. The comparison of means across different stages indicates that existential anxiety decreased in both the Hatha Yoga and Mindfulness groups in the post-test stage and remained relatively stable in the follow-up stage. However, no significant changes were observed in the Control group across the three stages.

In order to examine the significance of the interaction effect of time and group on generalized anxiety using multivariate analysis of variance (MANOVA), Wilks' Lambda was calculated, and the results are reported in [Table 3](#).

Table 3

Multivariate Analysis of Variance (MANOVA) for Generalized Anxiety

Effect	Test	Value	F	Hypothesis df	Error df	Sig.
Time	Pillai's Trace	0.944	228.920	2	27	0.000
	Wilks' Lambda	0.054	228.920	2	27	0.000
	Hotelling's Trace	16.957	228.920	2	27	0.000
	Roy's Largest Root	16.957	228.920	2	27	0.000
Time \times Group Interaction	Pillai's Trace	0.945	233.162	2	27	0.000
	Wilks' Lambda	0.055	233.162	2	27	0.000
	Hotelling's Trace	17.271	233.162	2	27	0.000
	Roy's Largest Root	17.271	233.162	2	27	0.000

According to [Table 3](#), the results of the multivariate analysis of variance indicate that the main effect of time and the interaction effect of time and group are significant for

generalized anxiety. The Wilks' Lambda value for the main effect of time indicates that the time factor significantly influenced the multivariate model, implying that generalized

anxiety changed over time ($F = 228.920$, $P < 0.05$). Moreover, the Wilks' Lambda value for the interaction effect of time and group also indicates a significant effect, meaning that the groups showed significant differences in generalized anxiety over time ($F = 233.162$, $P < 0.05$).

Table 4

Sphericity Test Results for the First Research Hypothesis

Source	Sum of Squares	df	Mean Square	F	Sig.	Effect Size	Power
Time	580.022	2	290.011	375.168	0.000	0.931	1.000
Time \times Group	539.022	2	269.678	269.678	0.000	0.926	1.000
Error	43.289	56	0.773				

The results confirm the research hypothesis, indicating that Hatha Yoga exercises are effective in reducing generalized anxiety among physically active and inactive men aged 30 to 50 years in Kermanshah.

Table 5

Multivariate Analysis of Variance for the Second Research Hypothesis

Effect	Test	Value	F	Hypothesis df	Error df	Sig.
Time	Pillai's Trace	0.974	514.272	2	27	0.000
	Wilks' Lambda	0.026	514.272	2	27	0.000
	Hotelling's Trace	38.094	514.272	2	27	0.000
	Roy's Largest Root	38.094	514.272	2	27	0.000
Time \times Group Interaction	Pillai's Trace	0.973	485.932	2	27	0.000
	Wilks' Lambda	0.027	485.932	2	27	0.000
	Hotelling's Trace	35.995	485.932	2	27	0.000
	Roy's Largest Root	35.995	485.932	2	27	0.000

The results of [Table 5](#) show that the MANOVA statistical tests for the Hatha Yoga and control groups indicate the significance of the main effect of time and the interaction of time and group on existential anxiety. The Wilks' Lambda value for the main effect of time suggests that time significantly influenced the multivariate model, indicating that existential anxiety changed over time ($F = 514.272$, $P < 0.05$). Furthermore, the Wilks' Lambda value for the

Mauchly's test for sphericity was conducted to examine the homogeneity of variances for generalized anxiety. The results of the repeated measures analysis of covariance based on the sphericity assumption are presented in [Table 4](#).

To investigate the significance of the interaction effect of time and group on existential anxiety through multivariate analysis of variance (MANOVA), Wilks' Lambda was calculated, and the results are presented in [Table 5](#).

interaction effect of time and group shows that the interaction is also significant, meaning the groups exhibited significant differences in existential anxiety over time ($F = 485.932$, $P < 0.05$). Considering the assumption of Mauchly's test of sphericity regarding the homogeneity of variances for existential anxiety, the results of the repeated measures analysis of covariance based on the sphericity assumption are shown in [Table 6](#).

Table 6

Sphericity Test Results for the Second Research Hypothesis

Source	Sum of Squares	df	Mean Square	F	Sig.	Effect Size	Power
Time	1243.089	2	621.544	606.150	0.000	0.956	1.000
Time \times Group	1079.489	2	539.744	526.379	0.000	0.949	1.000
Error	57.422	56	1.025				

The results in [Table 6](#) indicate that existential anxiety has changed over time ($F = 606.150$, $P = 0.000$), with an effect size of 0.956 for time in reducing existential anxiety.

Additionally, the interaction effect of time and group on existential anxiety was significant ($F = 526.379$, $P = 0.000$), with an effect size of 0.949. Therefore, the research

hypothesis is confirmed, and it can be concluded that Hatha Yoga exercises effectively reduce existential anxiety in physically active and inactive men aged 30 to 50 years in Kermanshah.

Table 7

Bonferroni Pairwise Comparisons for the Effect of Treatment on Generalized and Existential Anxiety

Variable	Comparison Groups	Mean Difference	Standard Error	Significance
Generalized Anxiety	Pre-test - Post-test	7.333	0.235	0.000
	Pre-test - Follow-up	7.356	0.232	0.000
	Post-test - Follow-up	0.022	0.117	1.000
Existential Anxiety	Pre-test - Post-test	10.911	0.272	0.000
	Pre-test - Follow-up	11.133	0.237	0.000
	Post-test - Follow-up	0.222	0.199	0.811

The data in [Table 7](#) show significant differences in generalized and existential anxiety between the pre-test and post-test, as well as the pre-test and follow-up stages ($P < 0.001$). However, no significant difference was observed

For pairwise comparisons of group scores, the Bonferroni post hoc test was used. The results for generalized anxiety are presented in [Table 7](#).

between the post-test and follow-up stages ($P > 0.001$). To further compare group scores, the Bonferroni post hoc test results for generalized and existential anxiety are presented in [Table 8](#).

Table 8

Bonferroni Pairwise Comparisons for the Effect of Treatment on Generalized and Existential Anxiety

Variable	Comparison Groups	Mean Difference	Standard Error	Significance
Generalized Anxiety	Hatha Yoga - Control	-6.578	0.546	0.000
	Mindfulness - Control	-6.911	0.546	0.000
	Hatha Yoga - Mindfulness	0.333	0.546	1.000
Existential Anxiety	Hatha Yoga - Control	-9.422	0.503	0.000
	Mindfulness - Control	-9.888	0.503	0.000
	Hatha Yoga - Mindfulness	0.466	0.503	1.000

The data in [Table 8](#) reveal that Hatha Yoga exercises and mindfulness-based therapy significantly reduced the mean scores of generalized and existential anxiety in physically active and inactive men aged 30 to 50 years in Kermanshah. However, no significant difference was found between the effects of Hatha Yoga and mindfulness-based therapy on generalized anxiety ($P > 0.001$). Therefore, both approaches had a relatively similar impact on reducing generalized anxiety in the target population.

4. Discussion and Conclusion

The results indicated that both Hatha Yoga exercises and mindfulness-based therapy were effective in reducing generalized anxiety and existential anxiety in physically active and inactive men aged 30 to 50 years in Kermanshah compared to the control group. In the comparison of the two methods, both approaches demonstrated significantly greater effects in the post-test phase compared to the pre-test, and these effects remained relatively stable during the

follow-up phase. However, in the control group, a relatively consistent trend was observed across all three stages.

These findings are consistent with prior studies ([Arablou, 2023](#); [Dehghani et al., 2019](#); [Eyvazi et al., 2019](#); [Jalilvand, Samadi, et al., 2021](#); [Jalilvand, Suri, et al., 2021](#); [Khayyati et al., 2021](#); [Sedigh & Niousha, 2017](#)), all of which have emphasized the effectiveness of yoga and mindfulness exercises in reducing anxiety.

This implies that Hatha Yoga, through physical movements, deep relaxation, breath control, cleansing processes, mental focus, and regular practice, leads to the dissipation of negative energies, stress control, and anxiety reduction. Similarly, mindfulness plays a crucial role in treating existential anxiety by empowering individuals to accurately identify their emotions and become aware of their tendencies and responses to different situations and individuals. Mindfulness, through cognitive restructuring, eliminates negative thoughts and emotions, helping

individuals to free themselves from rumination and negative emotions.

Overall, the present study demonstrated that the mindfulness program, by addressing both physiological and cognitive aspects and teaching modern techniques for thinking about and managing stressful situations, has a significant effect on reducing existential anxiety. This is achieved by fostering an impartial observing mindset and enhancing awareness of conscious content. Both approaches, by focusing on the mind, relaxation of the soul and body, and the integration and harmonization of the mind and body, have effectively reduced levels of generalized and existential anxiety and acted as a cognitive strategy for emotion regulation.

Therefore, the theoretical and empirical support confirms the claim that these two therapeutic approaches can have significant effects on reducing generalized and existential anxiety.

The present study, despite its valuable findings, has certain limitations that should be considered. First, the sample was limited to physically active and inactive men aged 30 to 50 years in Kermanshah, which restricts the generalizability of the findings to other populations, such as women or individuals from different age groups and cultural backgrounds. Second, the reliance on self-report questionnaires for data collection may introduce response biases, such as social desirability or recall bias. Third, the relatively short follow-up period limits the ability to assess the long-term sustainability of the observed effects. Additionally, factors such as individual differences in personality, lifestyle, and previous experiences with mindfulness or yoga practices were not controlled, which may have influenced the results.

Future studies should consider expanding the sample to include diverse demographic groups, including women, younger and older adults, and individuals from different cultural or socio-economic backgrounds, to enhance the generalizability of the findings. Longitudinal studies with extended follow-up periods are recommended to evaluate the long-term effectiveness and sustainability of Hatha Yoga and mindfulness-based interventions on anxiety reduction. Additionally, future research could incorporate objective physiological measures, such as heart rate variability or cortisol levels, to complement self-report data and provide a more comprehensive understanding of the interventions' impact. Comparing the effectiveness of Hatha Yoga and mindfulness with other therapeutic interventions, such as

cognitive-behavioral therapy, could also provide valuable insights into their relative efficacy.

The findings of this study have important practical implications for mental health professionals, educators, and policymakers. Mental health practitioners can incorporate Hatha Yoga and mindfulness-based interventions as complementary approaches in anxiety management programs, particularly for individuals experiencing generalized and existential anxiety. Schools and workplaces can benefit from implementing structured mindfulness and yoga programs to promote mental well-being and stress reduction among students and employees. Furthermore, healthcare policymakers should consider integrating such interventions into public health initiatives to provide accessible and cost-effective strategies for anxiety reduction. Lastly, the findings highlight the need for public awareness campaigns to educate individuals about the psychological benefits of mindfulness and yoga practices in daily life.

Authors' Contributions

All authors significantly contributed to this study.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

In this study, to observe ethical considerations, participants were informed about the goals and importance

of the research before the start of the interview and participated in the research with informed consent. The present study was approved by the university's ethics committee under the ethics code IR.IAU.ILAM.REC.2024.093.

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