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RESEARCH ARTICLE

Morning vs Evening Psychological Skills Training: Impacts on Psychosomatic Health in Kho-Kho Players

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Abstract
This study aims to investigate how the timing of exercise impacts psychological skill training and its influence on psychosomatic variables among college-level female Kho-Kho players. The study's subjects included 45 Kho-Kho players from various colleges in Tamil Nadu; each group had 15 subjects. The age range of the players was 18 to 25 years old. They had played Kho-Kho for a minimum of three years. Group I is the Psychological Skills Training Morning Group (PSTM), Group II is the Psychological Skills Training Evening Group (PSTE), and Group III is the control group. These groups consist of people who participated in inter-college tournaments in Tamil Nadu. To determine the effectiveness of the training method, the experimental group trained for 30 minutes in morning and evening practices for 6 weeks, while the control group continued the regular curriculum without receiving any special practices. The Depression Anxiety Stress Scales (DASS) encompassing 42 items will be utilized to measure depression, anxiety, and stress levels. Results from ANOVA indicated significant differences among the groups for depression ($F = 4.36326$, $p < 0.05$), stress ($F = 5.66268$, $p = 0.006647$), and anxiety ($F = 4.17362$, $p = 0.02222$). Post-hoc comparisons highlighted that the Psychological Skills Training Morning Group (PSTM) displayed significant differences compared to both the Psychological Skills Training Evening Group (PSTE) and the control group for depression, stress, and anxiety, indicating morning sessions' potential efficacy. Morning interventions seemed particularly effective in managing depression, stress, and anxiety compared to evening sessions or no intervention.

Keywords
Psychological Skill Training, Psychosomatic Variables, Dass, Kho-Kho, Women

INTRODUCTION

The field of sport psychology has devoted much attention to understanding the complex interactions between psychological variables and sport performance (Cerezuela et al., 2024). The study of psychosomatic variables, which involve the complex interaction of mind and body, is particularly important in this field (Lange-Smith et al., 2023; Barker et al., 2020). The most popular game in rural India, aside from Kabaddi, is the reasoning game Kho-Kho, which has an incredibly lengthy history. Among all of India's native group games, it is currently very widely recognized

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(Hussain & Cunningham, 2021). The expectation for these games is still high due to the widespread enthusiasm. It is quite difficult to determine the origin of Kho-Kho, although many historians think it is a modified version of "tag" or "catch," which is essentially the act of pursuing and touching a person. Originally from Maharashtra, Kho-Kho was known as Rathera in the past and was played on "raths," or chariots (Tripathi & Mishra, 2022; Tiwari & Agashe, 2016). A common technique is psychological skills training (PST), which teaches athletes techniques to improve the caliber and consistency of their performance. Psychological skills as cognitive-somatic methods, such as self-talk, imagery, and relaxation, while others use trait-like elements like drive, confidence, and concentration (Bekbossynov et al., 2023; Sanjaykumar, Rajkumar, & Lakshmi, 2023). Individual psychological elements, such as motivation, self-assurance, focus, visualization, and psychosomatic skills, have been the subject of most empirical research due to their impact on performance (Thelwell, Greenlees, & Weston, 2006; Turner et al., 2020). Likewise, a few studies have suggested that the use of cognitive abilities such as visualization, goal-setting, self-talk, and relaxation are crucial areas in sport psychology (Jun, Kim, & Choi, 2023; Sadeghi et al., 2010; Sanjaykumar, Rajkumar, & Lakshmi, 2024). The most common treatment for anxiety problems nowadays is cognitive behavioral therapy (CBT). Nonetheless, many individuals do not have total remission, with recovery rates of only 50%. Attempts to improve therapy efficacy have increased as a result (Frederiksen et al., 2021).

This study aims to investigate how the timing of exercise impacts psychological skill training and its influence on psychosomatic variables among college-level female Kho-Kho players.

MATERIALS AND METHODS

Participants

The study's subjects included 45 Kho-Kho players from various colleges in Tamil Nadu; each group had 15 subjects. The age range of the players was 18 to 25 years old. They had played Kho-Kho for a minimum of three years. Only individuals who are willing to participate and have signed an informed consent letter will be evaluated, as this is a qualitative and quantitative method of study.

Before the study commenced, all participants were fully briefed on the study's objectives, procedures, potential risks and benefits, confidentiality protocols, and their rights. The study was approved by the Ethics Committee of H.S. Skovoroda Kharkiv National Pedagogical University (Approval No. KhNPU/PhES/EC/3/3/2024), adhering to the ethical guidelines outlined in the Declaration of Helsinki for research involving human participants. Throughout the research, strict adherence to ethical standards was maintained, prioritizing the participants' well-being, protecting their rights, and ensuring confidentiality at every stage.

Research Model

Group I is the Psychological Skills Training Morning Group (PSTM), Group II is the Psychological Skills Training Evening Group (PSTE), and Group III is the control group. These groups consist of people who participated in inter-college tournaments in Tamil Nadu, India. The experimental group will receive self-talk, visualization, relaxation, and PST training from the programme using cognitive behavioral therapy (CBT) and the control group followed their regular curriculum without participating in any specialized training sessions during the study period.

To determine the effectiveness of the training method, the experimental group trained for 30 minutes in morning and evening practices for 6 weeks, while the control group continued the regular curriculum without receiving any special practices. They were trained in a 6-week experiment. We examined the effectiveness of this PST training across age groups for psychological conditions including depression, anxiety, and stress.

Data Collection Tool

Before administering the treatment, participants will undergo an initial assessment, serving as a pre-test. Subsequently, upon completion of the intervention, a post-test assessment will be conducted. The Depression Anxiety Stress Scales (DASS) encompassing 42 items will be utilized to measure depression, anxiety, and stress levels (Szabo & Lovibond, 2022). Each domain consists of 14 items, with respondents rating the frequency and intensity of symptoms using a 4-point Likert scale.

Statistical Analysis

The study utilized ANOVA, with a significance level of 0.05, to examine the effects of treatment while accounting for initial differences

among the 45 female Kho-Kho players. This method allowed for an analysis of how the timing of psychological skills training impacted depression, stress, and anxiety levels across the groups.

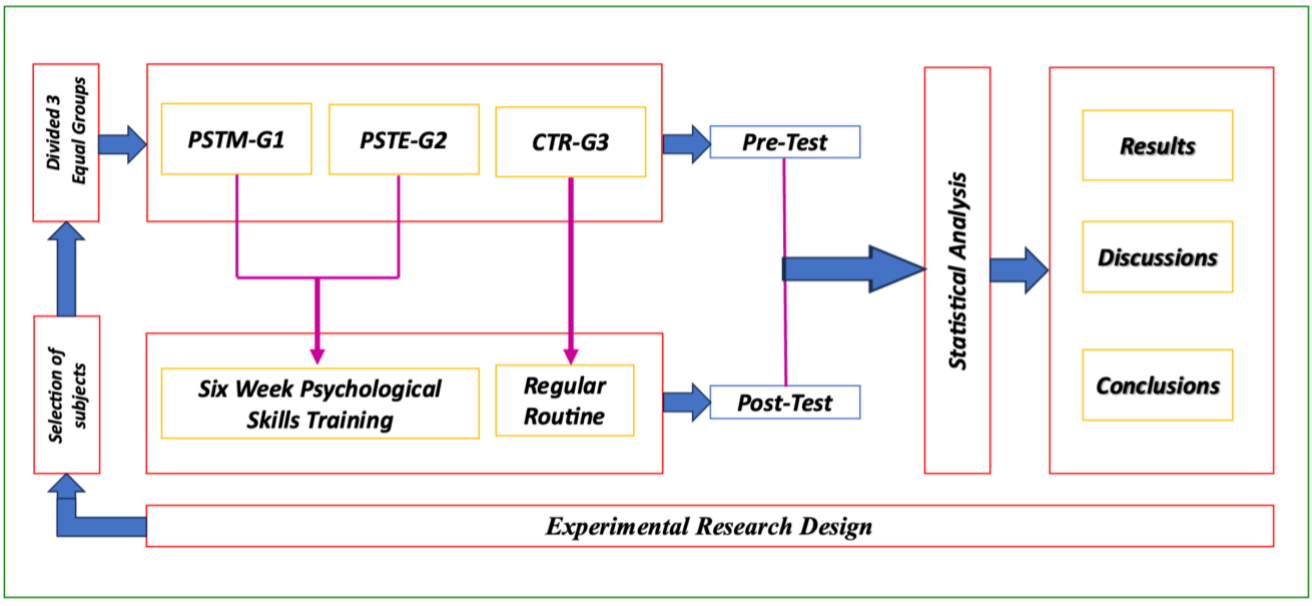

Figure 1. Architecture of the methodological process

RESULTS

This study investigates the effects of exercise timing on psychological skill training and psychosomatic variables in female Kho-Kho players. It analyses significant variations in depression, stress, and anxiety levels across morning and evening training groups, as well as a control group.

Table 1. Pre and post test data for depression, stress and anxiety

Variable	Group	Pre-Test Mean	SD	Post-Test Mean	SD	p-value
Depression	PSTM	12.33	3.45	8.27	2.95	0.010*
	PSTE	11.67	3.22	9.00	3.01	0.052
	Control	12.53	3.68	11.67	3.48	0.203
Stress	PSTM	15.67	4.78	9.27	3.62	0.003*
	PSTE	14.93	4.21	11.67	4.10	0.024*
	Control	16.53	4.92	14.67	4.87	0.142
Anxiety	PSTM	14.67	3.97	10.33	3.54	0.011*
	PSTE	13.93	3.84	11.83	3.65	0.059
	Control	15.33	4.11	14.10	4.25	0.239

Standard Deviation (SD), *Significant at $p < .05$

The pre- and post-test results indicate significant improvements in depression, stress, and anxiety for the Psychological Skills Training Morning (PSTM) group, with post-test p-values of 0.010 for depression, 0.003 for stress, and 0.011 for anxiety, demonstrating the effectiveness of the intervention. The Psychological Skills Training Evening (PSTE) group also experienced reductions in stress ($p = 0.024$) and anxiety ($p = 0.059$).

Table 2. ANOVA results and post-hoc group comparisons for depression

Source	SS	df	MS	F	p-value
Between-groups	128.0444	2	64.0222	4.36326	0.01898
Within-groups	616.2667	42	14.673		
Total	744.3111	44			
Comparison	**Mean Difference**			**SD**	**p-value**
PSTM vs PSTE	2.6667			4.1346	0.032*
PSTM vs Control	4.0667			3.9725	0.015*
PSTE vs Control	1.4			4.1129	0.385

Source of variance (SS), mean squares (MS), degrees of freedom (df), *Significant at $p < .05$

The ANOVA analysis indicates a significant difference in depression psychological variable among the groups ($F = 4.36326$, $p < .05$), with post-hoc comparisons revealing specific distinctions. While the Psychological Skills Training Morning Group (PSTM) displays notable differences compared to both the Psychological Skills Training Evening Group (PSTE) (mean difference = 2.6667, SD = 4.1346) and the control group (mean difference = 4.0667, SD = 3.9725), there is no significant difference observed between the Psychological Skills Training Evening Group (PSTE) and the control group (mean difference = 1.4, SD = 4.1129).

Table 3. ANOVA results and group comparisons for stress

Source	SS	df	MS	F	p-value
Between-groups	219.2444	2	109.6222	5.66268	0.006647
Within-groups	813.0667	42	19.3587		
Total	1032.3111	44			
Comparison	**Mean Difference**			**SD**	**p-value**
PSTM vs PSTE	2.9333			3.7378	0.027*
PSTM vs Control	5.4			4.4056	0.004*
PSTE vs Control	2.4667			4.8437	0.064

Source of variance (SS), mean squares (MS), degrees of freedom (df), *Significant at $p < .05$

The ANOVA analysis demonstrates a significant difference in stress levels among the groups ($F = 5.66268$, $p = 0.006647$), suggesting that the intervention type or timing has an impact on stress management outcomes. Post-hoc comparisons reveal that the Psychological Skills Training Morning Group (PSTM) significantly differs from both the Psychological Skills Training Evening Group (PSTE) (mean difference = 2.9333, SD = 3.7378) and the control group (mean difference = 5.4, SD = 4.4056). However, there is no significant difference observed between the Psychological Skills Training Evening Group (PSTE) and the control group (mean difference = 2.4667, SD = 4.8437).

Table 4. ANOVA results and group comparisons for anxiety

Source	SS	df	MS	F	p-value
Between-groups	144.8444	2	72.4222	4.17362	0.02222
Within-groups	728.8	42	17.3524		
Total	873.6444	44			
Comparison	**Mean Difference**			**SD**	**p-value**
PSTM vs PSTE	3.1			4.002	0.041*
PSTM vs Control	4.3333			4.125	0.017*
PSTE vs Control	1.2333			4.2276	0.394

Source of variance (SS), mean squares (MS), degrees of freedom (df), *Significant at $p < .05$

The ANOVA analysis indicates a significant difference in anxiety levels among the groups (F = 4.17362, p = 0.02222), suggesting that the interventions or treatments have an impact on anxiety outcomes. Post-hoc comparisons reveal that the Psychological Skills Training Morning Group (PSTM) significantly differs from both the Psychological Skills Training Evening Group (PSTE) (mean difference = 2.8, SD = 4.2873) and the control group (mean difference = 4.3334, SD = 3.2921). Additionally, a significant difference is observed between the Psychological Skills Training Evening Group (PSTE) and the control group (mean difference = 1.5334, SD = 4.456).

DISCUSSION

The research study aimed to investigate the effect of exercise timing on psychological skill training, specifically in the morning and evening, on psychological variables including stress, anxiety, and depression. The results from the analysis of variance (ANOVA) for each psychological variable revealed significant differences among the groups, indicating that the timing of interventions has a notable impact on psychological outcomes (Tiwari & Agashe, 2016; Hu & Chen, 2023).

In terms of depression, the ANOVA analysis indicated a significant difference among the groups (F = 4.36326, p < .05). Post-hoc comparisons revealed that the Psychological Skills Training Morning Group (PSTM) showed significant differences compared to both the Psychological Skills Training Evening Group (PSTE) and the control group, highlighting the potential efficacy of morning sessions in managing depression. Similarly, the analysis for stress levels also demonstrated significant differences among the groups (F = 5.66268, p = 0.006647). Post-hoc comparisons revealed that the Psychological Skills Training Morning Group (PSTM) significantly differed from both the Psychological Skills Training Evening Group (PSTE) and the control group, emphasizing the potential effectiveness of morning interventions in reducing stress levels. Moreover, for anxiety, the ANOVA analysis revealed significant differences among the groups (F = 4.17362, p = 0.02222). Post-hoc comparisons showed that the Psychological Skills Training Morning Group (PSTM) significantly differed from both the Psychological Skills Training Evening Group (PSTE) and the control group, indicating the potential benefits of morning sessions in anxiety management (Tripathi & Mishra, 2022; Hamilton & Fremouw, 1985; Vella-Fondacaro & Romano-Smith, 2023).

These findings underscore the importance of exercise timing in psychological skill training interventions for managing stress, anxiety, and depression. Morning sessions appear to be particularly effective in improving psychological well-being compared to evening sessions or no intervention. These results have significant implications for designing and implementing psychological interventions, emphasizing the need to consider the timing of interventions to optimize outcomes (Lange-Smith et al., 2023; Boughattas, Salha, & Moella, 2022). Further research exploring the underlying mechanisms and long-term effects of exercise timing on psychological variables is warranted to provide deeper insights into the relationship between exercise timing and psychological well-being (Romero-Gonzalez et al., 2020; Sanjaykumar, Rajkumar, & Lakshmi, 2023; Komarudin et al., 2024).

Conclusion

The research investigated the influence of exercise timing on psychological skill training, focusing on depression, stress, and anxiety variables. Results from ANOVA indicated significant differences among the groups for depression, stress, and anxiety. Post-hoc comparisons highlighted that the Psychological Skills Training Morning Group (PSTM) displayed significant differences compared to both the Psychological Skills Training Evening Group (PSTE) and the control group for depression, stress, and anxiety, indicating morning sessions' potential efficacy. Morning interventions seemed particularly effective in managing depression, stress, and anxiety compared to evening sessions or no intervention. These findings suggest that exercise timing plays a crucial role in psychological skill training outcomes, emphasizing the importance of considering timing factors in designing effective interventions for psychological well-being. Future research should explore the underlying mechanisms of these effects and examine their generalizability across diverse populations and contexts to optimize the delivery of psychological interventions. Overall, the study underscores the significance of timing in psychological skill training programs and

highlights morning sessions as promising avenues for enhancing mental health outcomes.

Acknowledgment

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Conflict of Interest

We affirm that the article we have authored does not involve any conflict of interest.

Ethics Statement

The study was approved by the Ethics Committee of H.S. Skovoroda Kharkiv National Pedagogical University (Approval No. KhNPU/PhES/EC/3/3/2024), adhering to the ethical guidelines outlined in the Declaration of Helsinki for research involving human participants.

Author Contributions

Conception and design of the study, SS, PYL, SN and RP; Data collection, SS, PYL, SN; Data analysis and interpretation, SS, NR, ZK and AMN; Drafting article and critical revision, SS, PYL, SN, RP, NR, ZK and AMN. All authors have read and approved the published version of the manuscript.

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