

CHAPTER 4

AIM AND OBJECTIVES

4.1 AIM

This study aimed to improve learning outcomes and adolescent development by implementing hatha yoga, a combination of hatha yoga and yoga-based learning strategies, and physical exercise interventions, assessing their impact on academic performance and related factors.

4.2 OBJECTIVES

School-based interventions, characterized by universal acceptance, ease of implementation, and cost-effectiveness, were conducted to assess their impact on significant factors related to the development and academic progress of adolescent students. The objectives are further categorized as follows:

4.2.1 PRIMARY OBJECTIVES

1. Evaluate the impact of hatha yoga and a jnana yoga-based learning strategy on academic skills, self-efficacy, working memory, emotional and behavioral problems, and anxiety through a pilot.
2. Then, compare the impact of Hatha Yoga, combined practices of Hatha and Jnana Yoga based learning strategies, and physical exercise on three homogeneous groups of adolescent students on academic performance, physical fitness, general intelligence, verbal working memory, academic skills, emotional and behavioral problems, academic self-efficacy, and test anxiety.
3. Expanding on this, the second objective was to examine how these three distinct interventions impacted the factors among the three groups, aiming to identify any noticeable variations in outcomes and significant predictors of academic performance within each group.

4. In addition, the study sought to explore the influence of socio-economic status and parenting styles on adolescent students' academic performance.
5. Moreover, the objective was to assess the feasibility and fidelity of implementing the diverse intervention programs. This included quantifying and understanding their effectiveness while also ensuring the collection of daily data to report any adverse effects of yoga practices.
6. Finally, the study aimed to gain insights into the impact of yoga programs through qualitative analysis of student interview transcripts, providing a comprehensive understanding of the interventions' effects.

4.2.2 SECONDARY OBJECTIVES

1. Identify learning strategies used by Indian educators for low-performing adolescents
2. Assess the role of critical thinking, intrinsic motivation, and task value in self-efficacy and learning performance
3. Study the effect of mindfulness on emotional/behavioral issues, self-esteem, and prosocial behavior in adolescents

4.3 JUSTIFICATION OF THE STUDY

The study aimed to evaluate factors influencing adolescents' academic performance through school-based interventions, aiming to assess academic outcomes (Affuso et al., 2023a; Chen & Yang, 2019; Kraft, 2020). Presently, there's a need for such interventions, marked by universal acceptability, ease of implementation, and cost-effectiveness (Corcoran et al., 2018; Dray et al., 2017). However, existing studies face limitations such as inappropriate instruments and oversight on frequency and intensity. There's also a lack of assessment regarding predictors influenced by various intervention types on academic performance, alongside deficiencies in planning, design, and follow-up of learning. Outcome measures, mainly self-reported, lack

integrated data and present mixed results, leading to inconclusive evidences (Ahmady et al., 2019; McPherson et al., 2018; Nesayan et al., 2018).

4.3.1 SCHOOL-BASED YOGA STUDIES: FINDINGS AND ROAD AHEAD

Adolescent well-being and academic performance are intertwined facets crucial for their holistic development. Yoga, an ancient mind-body practice, has garnered attention for its potential to enhance various aspects of adolescent well-being. With its holistic approach encompassing physical postures, breath regulation, and mindfulness practices, yoga interventions in schools aim to address psycho-physiological issues, stress, and socio-emotional disruptions that may impede academic performance. Research suggests that mitigating these factors through yoga may improve academic performance by promoting psycho-physiological health, social-emotional competencies, self-regulation, mindfulness, cognitive appraisal, awareness, and inter-personal skills (Donahoe-Fillmore & Grant, 2019; Gothe et al., 2019; Kongkaew et al., 2018; Shin, 2021).

Yoga, a mind-body practice that integrates physical postures, breath regulation, and mindfulness, is being explored for its potential benefits on adolescent development. While the relationship between muscular fitness and academic performance is still in its early stages of research, a study by Manzano-Sánchez et al. (2024) suggests that higher muscular fitness is associated with improved academic outcomes. Breath regulation practices, central to yoga, have also been shown to enhance cognitive abilities related to memory and improve cardiac autonomic functioning, both of which are essential for successful mental task performance (Singh & Rana, 2022). Furthermore, a study by Alomari (2023) revealed that students with higher academic achievement demonstrated greater mindfulness, while additional research shows that mindfulness enhances performance on cognitively demanding tasks.

Nevertheless, despite its promising potential, structured yoga programs implemented in schools are still in their infancy, with a scarcity of high-quality studies contributing to the

available evidence. It is imperative to expand and diversify the use of yoga as a universal intervention for adolescents, while simultaneously addressing cross-cultural barriers and dispelling misconceptions that may restrict its perception to merely a physical activity. Moreover, school-based interventions must be delivered in a safe, cost-effective, socially acceptable, and feasible manner to address factors associated with academic outcomes. Yet, limitations such as methodological challenges and uncertainties in statistical analysis need to be acknowledged and addressed to optimize the implementation of yoga interventions in educational settings (Boustani et al., 2020; Brinsley et al., 2021; Lack et al., 2020; Lewis-Smith et al., 2022; Malik et al., 2021; Moreno Molina et al., 2020; Telles et al., 2013; D. Wang & Hagins, 2016).

Recognizing the urgency of addressing low academic performance among Indian adolescents, the present study incorporates hatha and jnana yoga practices. These ancient mind-body practices aim to promote physical and mental well-being alongside academic development. By examining how yoga influences factors associated with academic performance, the study seeks to overcome challenges related to research design, sample size, and protocol suitability. Through a methodology incorporating stratified random allocation and optimal sample size grounded in ancient principles, the study aims to investigate the combined effect of hatha yoga and jnana yoga on the academic performance of adolescents (Miller et al., 2020; National Education Policy 2020, 2020; NHM, 2020).

4.3.2 PROPOSED STUDY

The proposed study aimed to address previous research limitations concerning adolescents and yoga. It suggested employing randomized controlled trials with active control groups, intent-to-treat analysis, and recruiting subjects based on their academic performance in the past academic year (Chung, 2018). Additionally, the study planned to involve stakeholders,

encourage positive interactions post-sessions, and assess perceptions towards yoga practices to enhance study rigor (Kishida et al., 2018).

The study also integrated learning principles from ancient jnana yoga strategies. Hatha yoga practices were included to cultivate a calm and focused mind before engaging in learning activities. Key principles such as respect for teachers, curiosity for knowledge, skill improvement, and nurturing a growth mindset were emphasized to facilitate effective learning outcomes (Butzer et al., 2015; Caballero et al., 2019; Hagins & Rundle, 2016; S. B. Khalsa & Butzer, 2016).

Furthermore, the study's methodological approach prioritized overcoming previous limitations. This included careful considerations of research design, sample size determination, support from ancient literature, employment of qualified trainers, comprehensive reporting of interventions and adverse effects, ensuring fidelity and feasibility of the study, and active involvement of all stakeholders (Breedvelt et al., 2019; Cramer et al., 2016, 2019; Espil et al., 2021; Gupta & Dhawan, 2022; McCurdy et al., 2024; S. Wang & Liu, 2022).

4.4 HYPOTHESIS

4.4.1 NULL HYPOTHESIS

1. Null Hypothesis (H₀): There is no significant difference in the impact of Hatha Yoga, combined practices of Hatha and Jnana Yoga, and physical exercise on various factors, including academic performance, physical fitness, general intelligence, verbal working memory, academic skills, mental health, academic self-efficacy, and test anxiety among three homogeneous groups of adolescent students.
2. Null Hypothesis (H₀): There are no noticeable variations in outcomes and significant predictors of academic performance among the three groups receiving distinct interventions.

3. Null Hypothesis (H0): Socio-economic status and parenting styles do not significantly influence adolescent students' academic performance.

4.4.2 ALTERNATE HYPOTHESIS

1. Alternate Hypothesis (H1): There is a significant difference in the impact of Hatha Yoga, combined practices of Hatha and Jnana Yoga, and physical exercise on various factors, including academic performance, physical fitness, general intelligence, verbal working memory, academic skills, mental health, academic self-efficacy, and test anxiety among three homogeneous groups of adolescent students.
2. Alternate Hypothesis (H1): There are noticeable variations in outcomes and significant predictors of academic performance among the three groups receiving distinct interventions.
3. Alternate Hypothesis (H1): Socio-economic status and parenting styles significantly influence adolescent students' academic performance.