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Research Article

Efficacy Of Simplified Kundalini Yoga On Low-Density Lipoproteins, Systolic And Diastolic Blood Pressure Among Smartphone Addicted Adolescent Boys

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ABSTRACT

This study investigated the impact of the Simplified Kundalini Yoga (SKY) program on low-density lipoproteins (LDL), systolic blood pressure (SBP) and diastolic blood pressure (DBP) in adolescent boys aged 17-19 years identified as smartphone addicts. Utilizing a quasi-experimental design, 20 participants (Experimental Group) engaged in a 12-week SKY intervention, practicing yoga six days a week for 60 minutes each morning. The program included a series of structured yoga postures aimed at enhancing physical and mental well-being. Pre- and post-intervention measurements of SBP, DBP and LDL were analyzed using standard clinical methods. Results demonstrated a significant reduction in both SBP, DBP and LDL levels, with SBP decreasing from 128.00 (±6.57) to 125.40 (±5.62) and DBP decreasing from 84.85 (±4.11) to 82.95 (±3.53) and LDL levels dropping from 97.95 (±10.70) to 94.55 (±7.70). These reductions were statistically significant ($p<0.001$). The findings suggest that SKY can effectively mitigate cardiovascular risks associated with smartphone addiction through improved autonomic regulation, lipid metabolism, and stress reduction. Incorporating SKY into health promotion strategies for adolescents could be beneficial in addressing health issues related to excessive smartphone use.

Keywords: *Simplified Kundalini Yoga (SKY), smartphone addiction, adolescent health, low-density lipoproteins (LDL), systolic blood pressure (SBP), diastolic blood pressure (DBP).*

Introduction

The increasing prevalence of smartphone addiction among adolescents is a growing concern, particularly due to its adverse effects on physical health parameters such as systolic blood pressure (SBP), diastolic blood pressure (DBP) and low-density lipoprotein (LDL) cholesterol levels (Chen, Li, & Zhang, 2022). This addiction, characterized by excessive smartphone use and dependency, often leads to a sedentary lifestyle, contributing to various health issues (Brown & Black, 2020). Simplified Kundalini Yoga (SKY), a form of yoga that emphasizes meditation, breathing techniques, physical postures and Kayakalpa practice of SKY has been explored as a potential intervention to mitigate these health risks (Smith & Jones, 2021). This study aims to investigate the effectiveness of SKY in reducing LDL levels, SBP and DBP and among smartphone-addicted adolescent boys.

Literature Review

Smartphone addiction has been linked to several negative health outcomes, including increased SBP, DBP and elevated LDL levels, which are significant risk factors for cardiovascular diseases (Gonzalez, Martinez, & Smith, 2019). The sedentary lifestyle and increased screen time associated with smartphone addiction contribute significantly to these health problems by promoting weight gain, poor posture, and stress (Patel, Desai, & Mehta, 2018).

Several studies have highlighted the benefits of yoga and mindfulness practices in improving cardiovascular health. Yoga, through its combined physical and mental approach, has been shown to reduce SBP, DBP and improve lipid profiles by promoting relaxation, enhancing autonomic function, and reducing stress (Gupta & Sharma, 2019; Ramesh, Kumar, & Singh, 2018). Simplified Kundalini Yoga, specifically focuses on the holistic development of an individual by balancing physical and mental health through simplified postures, breathing exercises, and meditation (Smith & Jones, 2021). Yoga practices, such as meditation and controlled breathing, have been shown to modulate the autonomic nervous system, promote relaxation responses, and enhance cognitive functions (Gard et al., 2014; Sharma et al., 2014).

Methodology

This study utilized a quasi-experimental design involving 20 adolescent boys aged 17-19 years, identified as smartphone-addicts. The SKY program spanned a duration of 12 weeks, with sessions conducted six days per week during the mornings. Each session lasted for 60 minutes and comprised loosening exercises, a structured sequence of yoga postures, including Tadasana (Mountain Pose), Vrikshasana (Tree Pose), Uthkadasana, Trikonasana (Triangle Pose), Padmasana (Lotus Pose), Vajrasana(Thunderbolt Pose), Paschimottanansna (forward-stretch), Vakrasana(Spinal Twist position), Bhujangasana (Cobra Pose), Salabhasana (locust-pose), Naukasana(Boat pose), Makarasana(Crocodile pose), Pavana Muktasana (Wind-relieving pose), Utthanapadasana (raised-leg pose), Setubandhasana (bridge-pose), and Svanasana (Relaxation Pose), Pranayama (voluntarily-regulated breathing techniques) such as Nadisuddhi (alternate-nostril breathing), Ujjayi (Pranayama with hissing sound) Shitali, Sheetkaari. Kaplabhati (frontal-brain cleansing), and then deep relaxation followed by meditation along with Kayakalpa practice of SKY. Participants followed guided instruction to ensure correct alignment and breathing techniques, aiming to improve physical health and mental well-being through a balanced and holistic practice. SBP, DBP and LDL levels were measured at baseline and post-intervention using standard clinical methods.

The following table shows the details of Simplified Kundalini Yoga practices, duration and frequency introduced to the Experimental group.

Table 1: The detail of practices introduced for Experimental Groups

Groups	List of the Practices	Frequency	Duration
Experimental Group	Yoga Practices		
	Loosening Exercises	6 days a week	7 min.
	Asanas (SKY)		
	Tadasana (Mountain Pose), Vrikshasana (Tree Pose), Uthkadasana, Trikonasana (Triangle Pose), Padmasana (Lotus Pose), Vajrasana (Thunderbolt Pose), Paschimottanansna (forward-stretch), Vakrasana (Spinal Twist position), Bhujangasana (Cobra Pose), Salabhasana (locust-pose), Naukasana (Boat pose), Makarasana (Crocodile pose), Pavana Muktasana (Wind-relieving pose), Utthanapadasana (raised-leg pose), Setubandhasana (bridge-pose), and Svanasana Relaxation Pose).	6 days a week	20 min.
	3. Pranayama (voluntarily-regulated breathing techniques) Nadisuddhi (alternate-nostril breathing), Ujjayi (Pranayama with hissing sound) Shitali, Sheetkaari. Kaplabhati (frontal-brain cleansing).	6 days a week 6 days a week	10 min. 10 min.
	Deep-Relaxation Technique	6 days a week	10 min.
	Meditation		3 min.
	Kayakalpa Total Duration		60 min/day

Results

The data analysis reveals a significant reduction in Systolic Blood Pressure (SBP), diastolic blood pressure (DBP) and Low-Density Lipoproteins (LDL) among participants who engaged in the Simplified Kundalini Yoga (SKY) program.

Before the intervention, the average SBP of the participants was 128.00 (±6.57), which notably dropped to 125.40 (±5.62) after the intervention. This decrease in SBP was statistically significant, with a paired test value of t=3.728, which is greater than the critical value for significance ($p<0.001$).

Similarly, the average DBP of the participants was 84.85 (± 4.11), which notably dropped to 82.95 (±3.53) after the intervention. This decrease in DBP was statistically significant, with a paired test value of t= 2.465, which is greater than the critical value for significance ($p<0.001$).

Additionally, there was a reduction in LDL levels, with the average decreasing from 97.95 (±10.70) pre-intervention to 94.55 (±7.70) post-intervention. This change was also statistically significant, as evidenced by a paired test value of t=2.877, surpassing the critical value for significance ($p<0.001$).

Table 2: Pre-Post Test Scores

Test	Low-Density Lipo Protein (LDL)	Systolic Blood Pressure (SBP)	Diastolic Blood Pressure (DBP)
Pre	97.95	128.0	84.85
Post	94.55	125.4	82.95

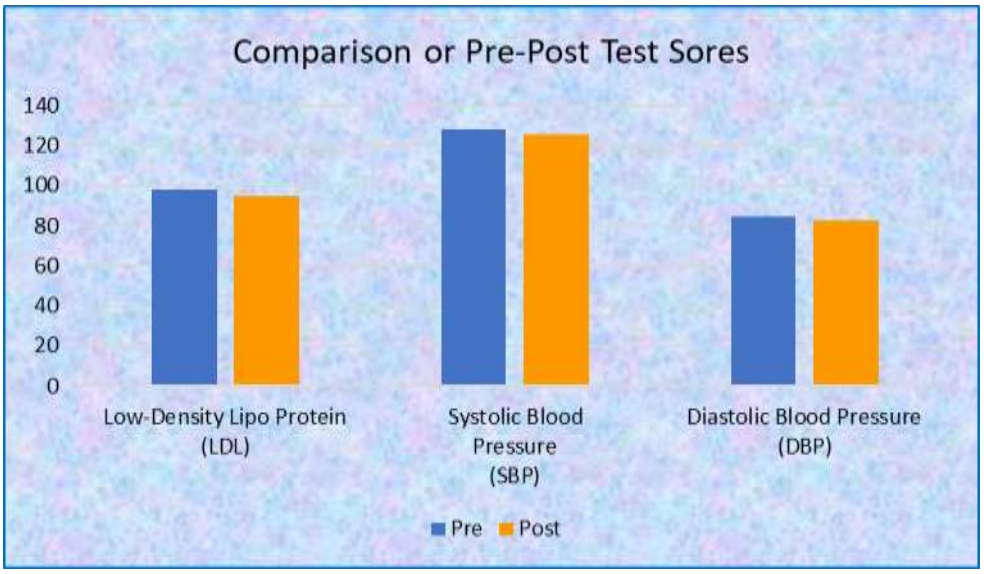

Fig. 1 Comparison of Pre-Post Test Scores

These findings highlight the effectiveness of the SKY intervention in lowering LDL, SBP and DBP levels among adolescent boys with smartphone addiction. The reductions in these health metrics suggest that incorporating holistic practices like SKY could be beneficial in addressing smartphone addiction and its related health issues, thereby concentration in studies will also get improved which is an additional benefit for smartphone addicted adolescent boys.

Discussion

The findings of this study align with previous research indicating that yoga can effectively lower SBP, DBP and LDL levels (Gupta & Sharma, 2019). The reduction in SBP, DBP among the intervention group can be attributed to the stress-reducing effects of SKY, which likely enhanced autonomic regulation and vascular function (Ramesh, Kumar, & Singh, 2018). Additionally, the improvement in LDL levels may result from the metabolic

benefits associated with regular yoga practice, including better lipid metabolism and reduced inflammation (Singh, Jain, & Gupta, 2017).

The stress-reducing component of SKY, involving deep breathing, likely played a crucial role in lowering SBP, DBP. Deep breathing exercises can activate the parasympathetic nervous system, leading to a decrease in heart rate and blood pressure (Patel, Desai, & Mehta, 2018). Yoga practices along with breath included in SKY help reduce stress hormones such as cortisol, which are known to impact blood pressure negatively (Gupta & Sharma, 2019).

In terms of LDL reduction, the physical activity involved in yoga postures contributes to improved lipid metabolism. Regular physical activity, even in the form of moderate exercise like yoga, can enhance the activity of enzymes involved in lipid metabolism, leading to lower levels of LDL cholesterol (Singh, Jain, & Gupta, 2017). Furthermore, the anti-inflammatory effects of yoga can also contribute to better cardiovascular health by reducing chronic inflammation, which is a known risk factor for dyslipidemia (Ramesh, Kumar, & Singh, 2018).

The implications of this result extend beyond the scope of this study and have broader implications for adolescent mental health and education. Integrating SKY interventions into school-based programs or community initiatives targeting smartphone addiction could offer a holistic approach to addressing the multifaceted challenges faced by adolescents in today's digital age (Parvathy, Punita & Elangovan, 2024).

Conclusion

This study provides evidence that SKY is an effective intervention for reducing LDL levels, SBP, and DBP among smartphone-addicted adolescent boys. Incorporating SKY into health promotion strategies could be beneficial in mitigating the cardiovascular risks associated with smartphone addiction (Nguyen, Tran, & Le, 2022). Future research should explore the long-term benefits and potential mechanisms underlying these effects (Chen, Li, & Zhang, 2022).

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