



GURU KASHI
UNIVERSITY
BATHINDA (PUNJAB)



GKU JOURNAL OF MULTIDISCIPLINARY RESEARCH

Peer-Reviewed Journal

Volume-1 | Issue-I | September, 2025 | ISSN:3049-298X

Visit for more information

<https://journal.gku.ac.in>

Editorial Board

**Chief Editor**

Prof. (Dr.) Piush Verma
Registrar, Guru Kashi
University, Talwandi Sabo,
Bathinda, Punjab.

**Editor**

Prof. (Dr.) Vijay Laxmi
Dean, Faculty of Computing,
Guru Kashi University,
Talwandi Sabo, Bathinda,
Punjab.

**Co-Editor**

Dr. Rajinder Kumar
Associate Professor, Faculty
of Computing, Guru Kashi
University, Talwandi Sabo,
Bathinda, Punjab.

Editorial Board Members

Dr. Dherendra Singh

Associate Professor, Computer
Science & Engineering Department
at Chandigarh College of
Engineering and Technology (CCET)
Degree Wing, Sector 26, Chandigarh.

Dr. Deepak Mehta

Professor, Department of Computer
Applications, Chandigarh University,
Punjab.

Prof. (Dr.) Navneet Seth

Dean, Faculty of Management and
Commerce, Guru Kashi University,
Talwandi Sabo Bathinda, Punjab.

Dr. Shruti Tiwari

Principal, Gyan Vihar School of
Education, Suresh Gyan Vihar
University, Jaipur.

Dr. Upinder Kaur

Associate Professor and Head,
Department of Computer Science and
Engineering, Akal University,
Talwandi Sabo, Bathinda, Punjab

Dr. Manpreet Kaur

Assistant Professor, Faculty of
Computing, Guru Kashi University,
Talwandi Sabo, Punjab.

Special Guest Editors

Dr. Amit Tuteja
(Faculty of Sciences,
Humanities &
Languages)

**Dr. Gurpreet
Kaur**
(Faculty of Visual
& Performing Arts)

**Dr. Sawtantar
Singh Khurmi**
(Faculty of Engineering
& Technology)

Dr. Kavita Rani
(Faculty of
Education)

Dr. Tanuj Sharma
(Faculty of
Management and
Commerce)

**Dr. Lokender
Kashyap**
(Faculty of
Agriculture)

**Dr. Gurpreet
Kaur**
(Faculty of Law)

**Dr. Devinder
Kumar**
(Faculty of
Pharmaceutical Sciences)

Dr. Sunny Arora
(Faculty of
Engineering &
Technology)

Dr. Shalu Gupta
(Faculty of Computing
Science)

**Dr. Jaswinder
Singh**
(Faculty of Physical
Education)

Dr. Stuti Mittal
(Faculty of Health
& Allied Sciences)

**Prof. Rajender
Kumar**
(Faculty of Health &
Allied Sciences)

AIM

Aim of JKU Journal of Multidisciplinary Research

The aim of the JKU Journal is to promote high-quality, original research and scholarly work across diverse academic disciplines, with a focus on advancing knowledge, fostering innovation, and supporting the academic and professional growth of researchers, educators, and students.



SCOPE

Scope of JKU Journal of Multidisciplinary Research

The scope of the journal includes interdisciplinary research in fields such as Science, Technology, Engineering, Management, Humanities, Social Sciences, and Education. It welcomes theoretical and applied studies, case studies, review articles, and technical reports. The journal encourages contributions that address contemporary challenges, propose innovative solutions, and reflect a commitment to academic integrity and societal impact.

By providing an open and inclusive platform, the JKU Journal aims to facilitate academic dialogue, strengthen industry-academia linkages, and contribute to national and global research communities.

Chancellor Message

It is with immense pride that I introduce the latest edition of the Guru Kashi University Journal of Multidisciplinary Research. This journal represents the continued mission of our university to nurture scholarly achievement and interdisciplinary inquiry. In this regard, as a cross-disciplinary academic platform, it is designed to link different areas of knowledge addressing the disparate issues facing our world today.

I warmly congratulate all contributors whose work and commitment to research and scholarship are reflected in this journal. Their strong commitment and collaboration, as well as that of the editorial board and reviewers, contribute to maintaining this journal at high standards.

At Guru Kashi University, we believe in promoting curiosity that transcends the boundaries of faculties, and this journal is a testament to that belief. It will continue to inspire future scholars and researchers to stretch, create, and read work that is part of an essential scholarly conversation.



S. Gurlabh Singh Sidhu

Chancellor

Vice Chancellor Message

It gives me great pleasure to present the inaugural issue of the JKU Journal of Multidisciplinary Research. This journal is an important step in Guru Kashi University's mission to promote academic excellence, innovation, and meaningful research.

In a world where boundaries between disciplines are steadily dissolving, true progress lies in multidisciplinary inquiry. This journal is designed as a peer-reviewed platform for scholars, researchers, and practitioners to share original ideas and solutions that address contemporary challenges.

I congratulate the editorial team, contributors, and reviewers whose dedication has made this first issue possible. I am confident the JKU Journal of Multidisciplinary Research will soon grow into a respected forum for knowledge creation and collaboration, reflecting our motto of "Empowering Youth, Empowering India."



Prof. Rameshwar Singh

Vice Chancellor

Index

Sr. No.	Paper Title/Authors	Page No.
1.	Impact of Nutritional Supplements on Muscle Recovery and Performance in Strength Sports ○ Dr. Arun Kumar, Assistant Professor ○ Mr. Harwinder Singh, Assistant Professor	06 – 11
2.	Influence of Academic Discipline and Activity-Based Learning on Big Five Personality Traits: A Comparative Study of Physical Education and Non-Physical Education Students ○ Akshay Kumar, Sumit Kumar and Diksha Sharma, Research Scholar ○ Dr. Surishtha Devi, Assistant Professor	12 – 20
3.	The Efficacy of Yoga in Managing Arthritis: A Review of Evidence-Based Studies ○ Ms. Sakshi Nagru, Assistant Professor ○ Mr. Gurdeep Singh, Assistant Professor	21 – 25
4.	Impact of swimming on the cardiovascular endurance of school student ○ Mr. Dusyant, M. P. Ed. Research Scholar ○ Dr. Jaswinder Singh, Associate Professor	25 – 31
5.	Effect of some selected exercises on flexibility and coordination of basketball players ○ Mr. Yogesh, M. P. Ed. Research Scholar, ○ Dr. Jaswinder Singh, Associate Professor	32 – 39
6.	The Impact of Physical Activity on Leg Strength Among School-Aged Students ○ Mr. Harwinder Singh, Assistant Professor	40 – 44
7.	Exploring the Impact of Regular Yoga Practice on Women's Physical Fitness and Mental Well-being ○ Dr. Rajwinder Kaur, Assistant Professor ○ Dr. Ravi Kumar. Professor	45 – 54
8.	The Role of Physical Education in Preventing and Reducing Drug Addiction Among Adolescents ○ Dr. Jaswinder Singh, Associate Professor ○ Ms. Sakshi Nagru, Assistant Professor	55 – 60
9.	Need of Yoga and Meditation for Balanced Life Style ○ Rohtash, Research Scholar ○ Dr. Rajwinder Kaur, Assistant Professor	61 – 69

Sr. No.	Paper Title/Authors	Page No.
10.	Analysis of Physical Fitness Components Among Athletes and Non-Athletes ○ Dr. Aarif Majeed, Assistant Professor ○ Mr. Lakhveer Singh, Assistant Professor ○ Mr. Gurdeep Singh, Assistant Professor	70 – 76
11.	Importance of Yoga in Modern Life ○ Ms. Ramanpreet Kaur, Research Scholar ○ Dr. Rajwinder Kaur, Assistant Professor	77 – 83
12.	The Impact of Physical Education on Student Mental Health ○ Mr. Gurdeep Singh, Assistant Professor ○ Ms. Sakshi Nagru, Assistant Professor	84 – 87
13.	Application of Machine Learning in Citizen-Centric Services: National Strategy and the Punjab Paradigm ○ Mr. Manpreet Singh Gill, Assistant Professor	88 – 92
14.	Mental Health and Social Media: Reviewing Recent Research on Students with Psychiatric Issues ○ Dr. Rajinder Kumar, Associate Professor	93 – 97
15.	Fundamental Investment Analysis of FMCG Giants on the NSE: A Strategic Perspective ○ Mr. Sohail Verma, Ms. Simran Monga, Assistant Professor ○ Dr. Pretty Bhalla, Assistant Professor ○ Dr. Bharti, Assistant Professor	98 – 107

Received: 18.07.2025Accepted: 16.09.2025Published: 25.09.2025Page No: 06 – 11DOI: [10.5281/zenodo.17206201](https://doi.org/10.5281/zenodo.17206201)✉: gkujournal@gku.ac.in

Impact of Nutritional Supplements on Muscle Recovery and Performance in Strength Sports

¹Dr. Arun Kumar, ²Mr. Harwinder Singh^{1,2}Assistant Professor, Faculty of Physical Education, Guru Kashi University Talwandi Sabo, BathindaEmail: ¹arunthakur0008444@gmail.com, ²harwindersingh171804@gku.ac.in

Abstract – The purpose of this research is to investigate how nutritional supplements, specifically protein, branched-chain amino acids (BCAAs), and creatine, affect muscle rehabilitation and performance in strength sports. Fifty male athletes aged 18 to 25 from Himachal Pradesh took part in an 8-week randomized controlled trial. Subjects were randomly assigned to one of five groups: control, protein, BCAA, creatine or combination. Outcomes were one-repetition maximum (1RM) strength, delayed onset muscle soreness (DOMS) for recovery, and muscle mass. Results demonstrated that all the former outperformed the latter in term of strength, recovery, and muscle growth. Combined supplement group presented the most beneficial effects in all the outcome variables with an 18.46% increment in 1 RM, 57.53% decrement in DOMS, 4.0 kg of muscle mass gain. Of the individual supplements, creatine produced the greatest effect on strength and muscle mass, and BCAAs were the soundest bet for reducing muscle soreness. These observations provide rationale for recommending targeted and combined supplementation approaches to enhance athletic performance and recovery in strength sports.

Keywords – nutritional supplements, muscle recovery, strength performance, BCAAs, protein, creatine, randomized controlled trial.

1. INTRODUCTION

Powerlifting (PL), bodybuilding (BB) and Olympic weightlifting (WL) are strength sports that demand for high levels of muscular strength, resistance to fatigue and swift recovery. In these regions, often athletes have ambitious preparation schedules that involving exercise to they muscle tired and tissue hurt term use fatigued, energy depleted. Thus, recovery of muscle is important for enhancing performance and minimizing injuries. The consumption of nutritional supplements has increased in recent years to improve athletic performance and recovery.

Protein supplements, BCAAs and creatine monohydrate are commonly used by athletes to enhance recovery, muscle hypertrophy, and attenuate exercise-induced muscle damage (Jäger et al., 2017; Kerksick et al. They're easily accessible and simple to add to meals, with ample research demonstrating they work well when used properly.

Protein supplementation, especially from whey protein isolate, is known for its quick absorption and high leucine content, which promotes muscle protein synthesis after exercise (Phillips, 2014). BCAAs, including leucine, isoleucine, and valine, serve as vital components during exercise. They help reduce muscle soreness and fatigue by decreasing muscle protein breakdown and lowering lactate buildup (Shimomura et al., 2006). Creatine, one of the most researched and effective performance aids, helps increase power output and lean muscle mass (Kreider et al., 2017). Creatine is important for the process of ATP resynthesis.

Most research on nutritional supplementation has focused on Western populations or elite athletic environments and has often overlooked regional and demographic differences. Despite the widespread use of nutritional supplements, limited real-world evidence examines their application among recreational or semi-professional athletes in specific regions like Himachal Pradesh, India. Factors such as dietary habits, training environments, climate, and access to quality supplements can affect the effectiveness and results of supplementation.

Moreover, most investigations focus on isolated supplements, and a limited number of studies has investigated the cumulative effect of different supplements over a defined time. To design optimal nutrition strategies for strength athletes, it is necessary to appreciate whether there are interactive effects of different supplements, and if stacking supplements produces more favorable outcomes.

Thus, the purpose of this study will be to explore these research gaps by evaluating consumption of protein, BCAAs and creatine on muscle recovery and strength performance among young male strength athletes from Himachal Pradesh between 18-25 years. The goal is to provide evidence-based insights that can improve coaching methods, athlete nutrition planning, and future sports science research in India. These insights will be gathered through a randomized controlled experiment conducted over eight weeks.

2. OBJECTIVES

1. To determine the effects of protein supplementation upon muscle recovery and strength training performance.
2. To determine the effects of BCAAs on muscle soreness and recovery.
3. To establish the role of creatine in boosting explosive strength and increasing muscle mass.
4. To compare the effectiveness of various supplements for young male athletes.

3. METHODOLOGY

3.1 Participants

A total of 50 male athletes aged 18 to 25 engaged in strength training in Himachal Pradesh for this study. All participants trained at least four times each week. Individuals with medical conditions or those who had taken supplements in the last three months were excluded.

3.2 Design and Groups

3.2.1 The research was a randomized controlled trial that lasted for eight weeks. The participants were randomly divided into five groups, with ten individuals in each group:

- **Group A:** Control (no supplements)
- **Group B:** Protein Supplement
- **Group C:** BCAA Supplement
- **Group D:** Creatine Supplement
- **Group E:** Combined Supplement (Protein + BCAA + Creatine)

3.2.2 Supplementation Protocol

- **Protein:** 25g whey isolate, after working out.

- **BCAAs:** 10g, during the workout.
- **Creatine:** 5g, after working out.

3.2.3 Measures

- **Performance:** 1RM Bench Press and Squat.
- **Recovery:** Recovery time (hours), DOMS scale (1 to 10).
- **Anthropometry:** Body weight, muscle mass measured by bioelectrical impedance analysis.

3.3 Results:

Table-3.3.1 Pre and Post 1RM Performance (Bench Press in kg)

Group	Pre-Test Mean $\pm$ SD	Post-Test Mean $\pm$ SD	% Improvement
Control	65.4 $\pm$ 5.2	66.1 $\pm$ 5.1	1.07%
Protein	66.0 $\pm$ 4.8	72.8 $\pm$ 5.0	10.30%
BCAA	64.5 $\pm$ 4.9	69.2 $\pm$ 5.2	7.29%
Creatine	65.2 $\pm$ 4.5	74.5 $\pm$ 5.4	14.26%
Combined	65.0 $\pm$ 5.0	77.0 $\pm$ 5.5	18.46%

The combined supplement group showed the best improvement in bench press performance, increasing by 18.46%. Creatine followed with a 14.26% gain, protein had a 10.30% increase, and BCAA improved by 7.29%. The control group made only a small gain of 1.07%.

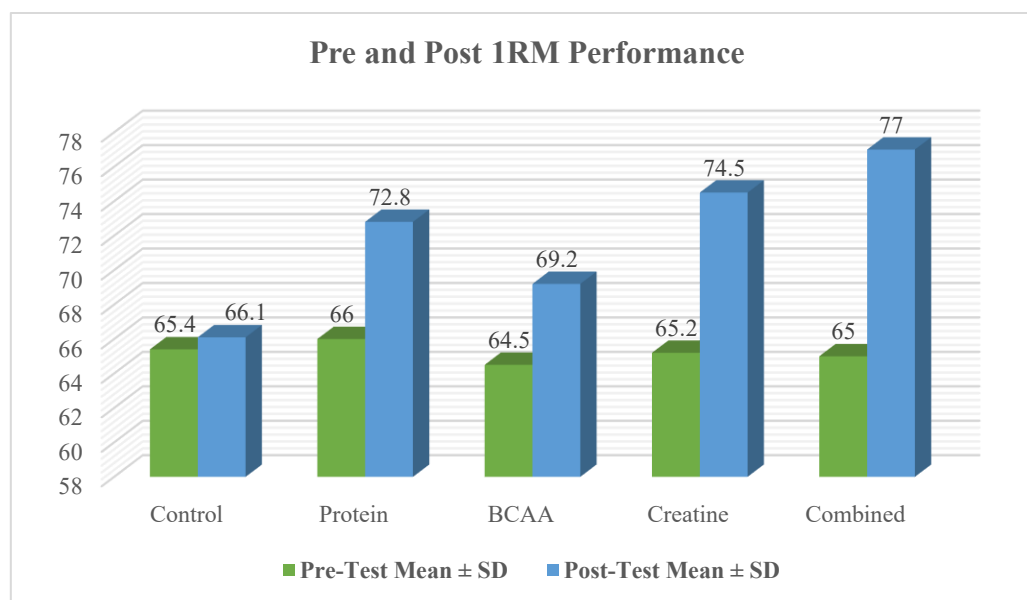


Figure-3.3.1 shows the Pre and Post 1RM Performance (Bench Press in kg)

Table-3.3.2 DOMS Score (48 hrs Post Training)

Group	Week 1	Week 8	% Reduction
Control	7.2	6.9	4.17%
Protein	7.0	4.2	40.00%
BCAA	7.4	3.9	47.30%
Creatine	7.1	4.1	42.25%
Combined	7.3	3.1	57.53%

The combined group showed the largest decrease in soreness at 57.53%. BCAAs were the most effective individual supplement, reducing soreness by 47.30%. This was followed by creatine at 42.25% and protein at 40.00%. The control group had a minimal change of 4.17%.

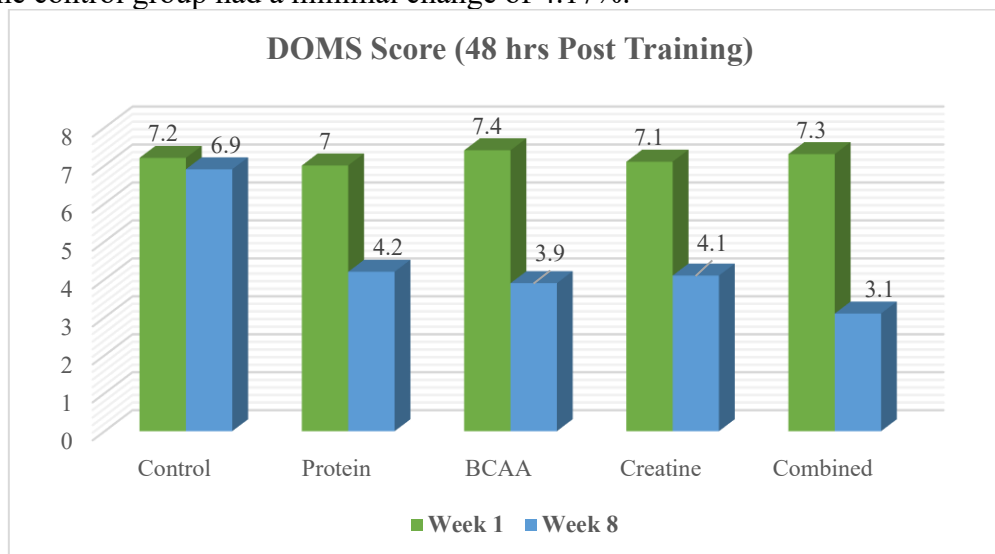


Figure-3.3.2 shows the DOMS Score (48 hrs Post Training)

Table-3.3.3 Muscle Mass Gain Over 8 Weeks (kg)

Group	Pre-Test	Post-Test	Net Gain
Control	61.2	61.6	+0.4 kg
Protein	60.5	63.0	+2.5 kg
BCAA	61.0	62.2	+1.2 kg
Creatine	60.8	63.8	+3.0 kg
Combined	61.5	65.5	+4.0 kg

The combined supplement group showed the largest increase in muscle mass at +4.0 kg. Creatine contributed +3.0 kg, protein added +2.5 kg, and BCAA provided +1.2 kg. In contrast, the control group had a slight gain of +0.4 kg.

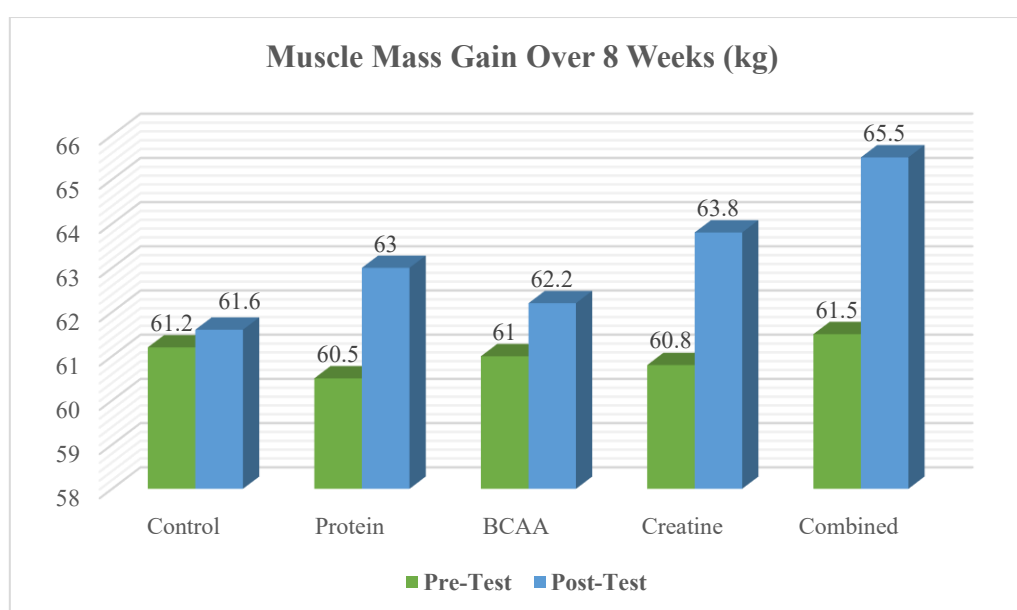


Figure-3.3.3 shows the Muscle Mass Gain Over 8 Weeks (kg)

4. DISCUSSION

The results of this study show that nutritional supplements have a significant impact on improving muscle recovery and performance in athletes who compete in strength sports. Protein, BCAAs, and creatine are effective when taken alone, but they work much better together (Kreider et al., 2017; Jager et al., 2017). These results accord with previous research that the three nutrients are more effective in combination.

For strength, creatine has the largest individual effect of 14.26%, then protein and BCAAs. For recovery, the reduction in DOMS was dominated by BCAAs with contributions from creatine and protein. The subgroup taking all three performed markedly better than other groups on all outcomes, with a strong joint effect.

These results align with existing research that supports protein's role in muscle growth (Phillips, 2014), BCAAs in recovery (Shimomura et al., 2006), and creatine in increasing strength and power (Kreider et al., 2017). Although the sample size was small and focused on young males, this study gives practical evidence for using supplements in strength training.

5. CONCLUSION

Nutritional supplements, especially creatine and protein, greatly improve strength performance and muscle recovery. BCAAs effectively reduce soreness after exercise. Using protein, BCAAs, and creatine together gives the best results in all areas. Well-planned supplement strategies should be a key part of training programs for strength athletes.

6. RECOMMENDATIONS

1. Coaches and athletes should think about using structured supplements to improve recovery and performance.
2. Further research with female athletes and different age groups is recommended.
3. Long-term studies could help assess the lasting effects and safety of supplements.

REFERENCES

- [1] Bray, M. S., & O'Neal, K. (2015). Creatine supplementation improves exercise performance. *Journal of Sports Science & Medicine*, 14(2), 255-261.
- [2] Garthe, I., & Maughan, R. J. (2018). Athletes and football: Effects of nutrition on performance. *Journal of Sports Sciences*, 36(1), 3-9.
- [3] Jager, R., Kerksick, C. M., Campbell, B. I., Cribb, P. J., Wells, S. D., Skwiat, T. M., ... & Antonio, J. (2017). International Society of Sports Nutrition position stand: protein and exercise. *Journal of the International Society of Sports Nutrition*, 14(1), 20. <https://doi.org/10.1186/s12970-017-0177-8>.
- [4] Kerksick, C. M., Wilborn, C. D., Roberts, M. D., & Smith-Ryan, A. E. (2018). Creatine supplementation and its potential to improve exercise performance and muscle mass. *Journal of Strength and Conditioning Research*, 32(1), 123-134.
- [5] Kreider, R. B., Kalman, D. S., Antonio, J., Ziegenfuss, T. N., Wildman, R., Collins, R., & Candow, D. G. (2017). International Society of Sports Nutrition position stand: safety and efficacy of creatine

- supplementation in exercise, sport, and medicine. *Journal of the International Society of Sports Nutrition*, 14(1), 18. <https://doi.org/10.1186/s12970-017-0173-z>.
- [6] Maughan, R. J., & Shirreffs, S. M. (2016). Hydration and performance in sport. *Journal of Sports Sciences*, 34(10), 933-942.
- [7] Phillips, S. M. (2014). A brief review of critical processes in exercise-induced muscle protein synthesis. *Sports Medicine*, 44(S2), S31-S42.
- [8] Shimomura, Y., Murakami, T., & Yamamoto, Y. (2006). Branched-chain amino acids and muscle protein synthesis in humans. *Journal of Nutrition*, 136(2), 532S-535S.
- [9] Stout, J. R., & Cramer, J. T. (2018). The effect of creatine supplementation on the recovery of muscular function and metabolic function after exhaustive exercise. *Journal of Sports Science & Medicine*, 17(2), 210-220.
- [10] Tipton, K. D., & Wolfe, R. R. (2004). Protein and amino acids for athletes. *Journal of Sports Sciences*, 22(1), 65–79. <https://doi.org/10.1080/0264041031000140554>.

Received: 12.08.2025Accepted: 16.09.2025Published: 25.09.2025Page No: 12 – 20DOI: [10.5281/zenodo.17206294](https://doi.org/10.5281/zenodo.17206294)✉: gkujournal@gku.ac.in

Influence of Academic Discipline and Activity-Based Learning on Big Five Personality Traits: A Comparative Study of Physical Education and Non-Physical Education Students

¹Akshay Kumar, ²Dr. Surishtha Devi, ³Sumit Kumar and ⁴Diksha Sharma^{1,3,4}Research Scholar, Department of Physical Education, Himachal Pradesh University, Summerhill, Shimla (H.P.)²Assistant Professor, Department of Physical Education, MCM DAV College Kangra (H.P.).

Abstract – This paper surveys the role of academic discipline with respect to personality traits of the Big Five model, which are extraversion, agreeableness, conscientiousness, neuroticism and openness, which are influenced by the personal disposition as well as the learning surroundings. Physical education (PE) provides a body-in-action learning environment that can lead to different personality characteristics than other, more sedentary academic programs. The authors of this paper investigate the variations of the Big Five personal traits in PE and non-PE students at undergraduate and postgraduate levels. A multi-stage sampling process was used with 120 total participants (an equal number of female and male in each of the academic levels). BFI-Big Five Inventory (John & Srivastava, 1999) was used and group differences were determined with the help of independent t-tests in SPSS 27. The findings show that male PE students at both academic levels recorded higher scores on extraversion and conscientiousness and higher neuroticism at the undergraduate level. The results demonstrated that females are more conscientious at postgraduate PE and neurotic at undergraduate PE than their non-PE counterparts. This evidence leads to the argument that lifetime participation in structured, physical and socially mediated affairs might not only focus on the point of attracting individuals with specific traits of personality but also help them acquire self-control, social sensitivity and friendliness. The polarities suggest the inclusion of structured activity-based elements in learning plans to promote desirable personalities. Research in the future needs to consider the causal mechanisms, cross-cultural situations and long-term tendency of personality change across various educational contexts.

Keywords – Big Five Personality Traits, Physical Education Students, Academic Discipline and Personality, Activity-Based Learning, Comparative Personality Study, Undergraduate and Postgraduate Students. Personality Development in Education.

1. INTRODUCTION

Personality, often conceptualised through the Big Five framework of neuroticism, extraversion, openness, agreeableness and conscientiousness, influences how students think, learn and act. The growing body of literature demonstrates that the type of educational environment not only shapes, but also attracts specific dispositional profiles. Therefore, comparing personality traits across various fields provides a valuable insight into student development and their alignment with their environment. In no other discipline is this dance more apparent than in physical education (PE), in which coursework is itself embodied and social

and where individual differences can be directly translated into instructional strategy, philosophy of coaching and lifelong practice of physical activity.

Since the previous decade, an extraordinary accumulation of evidence suggests a specific trait constellation within the population of physical education majors. Large cross-sectional samples of European undergraduates indicate that physical education students tend to be highly extraverted and conscientious, while scoring low on neuroticism compared to their peers in sedentary disciplines such as humanities or engineering (Kuśnierz et al., 2020; Schmidt & Kruger, 2023). These dispositional advantages are not only descriptive: lower neuroticism and more conscientiousness, better intrinsic motivation and consequently a better GPA were found in the analysed Polish-Ukrainian cohort; the relationships held even after adjusting for gender and year of study (Kuśnierz et al., 2020). The long-term monitoring of activities such as sport has also demonstrated that a high and stable level of activity explains variation in personality across time, with greater baseline physical activity associated with stronger stability in extraversion and conscientiousness, as well as a reduction in neuroticism over time from three multi-decade samples on average (Sutin et al., 2018). The same findings are confirmed when the relative importance of competitive sport is studied in a meta-analysis, with extraversion and conscientiousness being positively associated to better athletic endeavours, while neuroticism has a weak negative association (Yang et al., 2024; Piepiora & Naczyńska, 2023).

Academic majors exhibit differences that go beyond the simple dichotomy of physical versus non-physical education. Studies of latent-profile analysis indicated that when considering a unique profile of personality structures, STEM, social science and arts students can be grouped into distinct personality structures that hold consistency across the universities without randomness; thus, the culture of disciplines self-identifies and fosters specific attributes (Kokkinos, Antoniadou & Voulgaridou, 2024). These tendencies are supported by the Indian and Ghanaian research of the same nature, as their results show that education and business versus art majors vary considerably in terms of openness, conscientiousness and agreeableness (Mishra, 2016; Opoku et al., 2023). Even in courses related to sport, such as a degree in it, specialisations (e.g., coaching or physiotherapy) can align with more latent dispositions (Sethi & Mehta, 2020).

Nevertheless, relatively few comparative studies explore the use of physical education majors in the context in which it is the only activity in comparison to a wide variety of other majors to employ gender balance, participation in competitive sport and academic motivation. Even the existing literature is based on single-country samples or a sample composed purely of varsity athletes and non-athletes (Rezaei Talyabee et al., 2013). Furthermore, there has been limited use of theoretical paradigms that combine personality with self-determination theory and achievement-goal paradigms to integrate multiple majors into a single study. It follows that an accurate understanding of the differences in trait profiles across college degrees may be used to optimise or customise mentoring, curricular development and mental health services.

2. METHOD AND MATERIAL

We used a multi-stage sampling technique to determine the relevant sample size. In the first step, five departments out of a total of 27 departments were randomly picked and as soon as the list of the students was prepared, the systematic random sampling method was used to select sample P.G. students. The convenience sampling method was used to select the undergraduate students and a local college was identified and used to sample the subjects. The sample size will be 120 students, comprising 60 postgraduate (60 male, 30 female) and 60 undergraduate (30 male and 30 female). To measure the personality traits, the Big Five Inventory (BFI) developed by John and Srivastava in the year 1999 was used. To analyse the data, SPSS 27 will be used for independent t-tests.

2.1 RESULT

Table 2.1: presents a comparative analysis of Personality traits between Male Physical Education Students and Other Discipline Students of Post Graduation

Variables	Physical Education Students (N=20)		Other Discipline Students (N=20)		t- ratio
	Mean	S.D.	Mean	S.D.	
Extraversion	27.35	4.24	24.63	7.80	3.35**
Agreeableness	30.16	8.36	30.47	6.59	0.35
Conscientiousness	27.55	3.91	25.55	14.15	2.08*
Neuroticism	24.44	8.02	23.78	19.62	0.54
Openness	37.16	19.20	32.85	22.24	2.92**
Total Personality	146.5	60.62	137.53	72.04	3.35**

*Significant at .05 level (t=2.02), **Significant at .01 level (t=2.70), df=38

The comparison made between male physical education students and their study mates in other fields at the postgraduate level indicates some personality markers that are quite different. The students of physical education are more extraverted, conscientious and open and show higher scores of the whole phenomenon; the difference was statistically significant. It implies that they are usually more socially active, disciplined and ready to experience other things in comparison to students undertaking other academic disciplines. However, regarding the characteristics of agreeableness and neuroticism, no substantial difference was found between the two groups, indicating similarities in their cooperative behaviours and emotional stability. Generally, the results mark different personality trends related to physical education training relative to other courses.

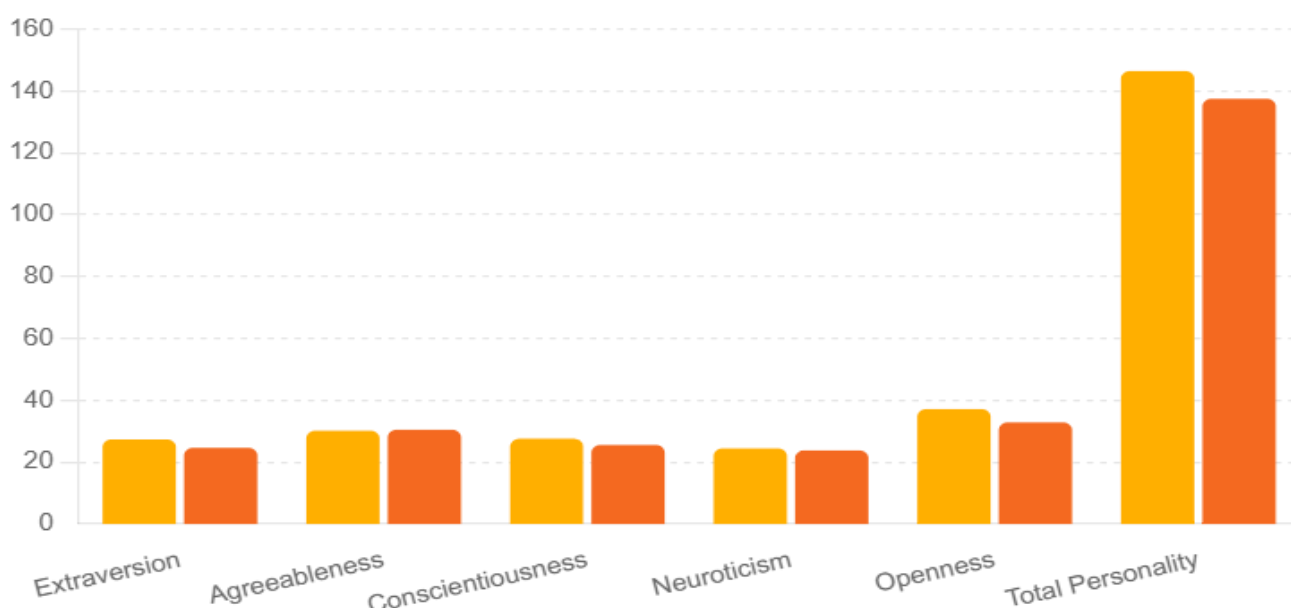


Figure 1 shows the mean values of personality traits for male physical education students compared to those in other disciplines at the postgraduate level.

Table 2.2 presents a comparative analysis of personality traits between male students from physical education and male students from other disciplines in undergraduate programs.

Variables	Physical Education Students (N=20)		Non-Physical Education Students (N=20)		t- ratio
	Mean	S.D.	Mean	S.D.	
Extraversion	25.55	4.97	23.75	9.46	2.08*
Agreeableness	26.55	8.26	27.84	7.58	1.38
Conscientiousness	28.17	7.91	25.68	4.12	3.06**
Neuroticism	25.66	9.176	23.42	7.59	2.35*
Openness	32.44	8.26	31.79	6.06	0.74
Total Personality	138.39	40.96	132.45	30.79	3.04**

*Significant at .05 level ($t=2.02$), **Significant at .01 level ($t=2.70$), $df=38$

The comparison of physical education males and non-physical education students at the undergraduate level depicts significant differences in a number of personality traits. There is much greater extraversion, conscientiousness and neuroticism, as well as overall personality scores, in the physical education students, showing that the former students are on the whole more outgoing, disciplined and emotionally reactive, as well as have stronger overall personality traits, than the rest of the non-physical education students. Conversely, both groups do not differ by much, or not at all, in terms of agreeableness and openness, indicating more or less the same levels of cooperativeness and openness to innovative ideas. These results show a correlation between certain personality peculiarities and involvement in physical education during undergraduate studies.

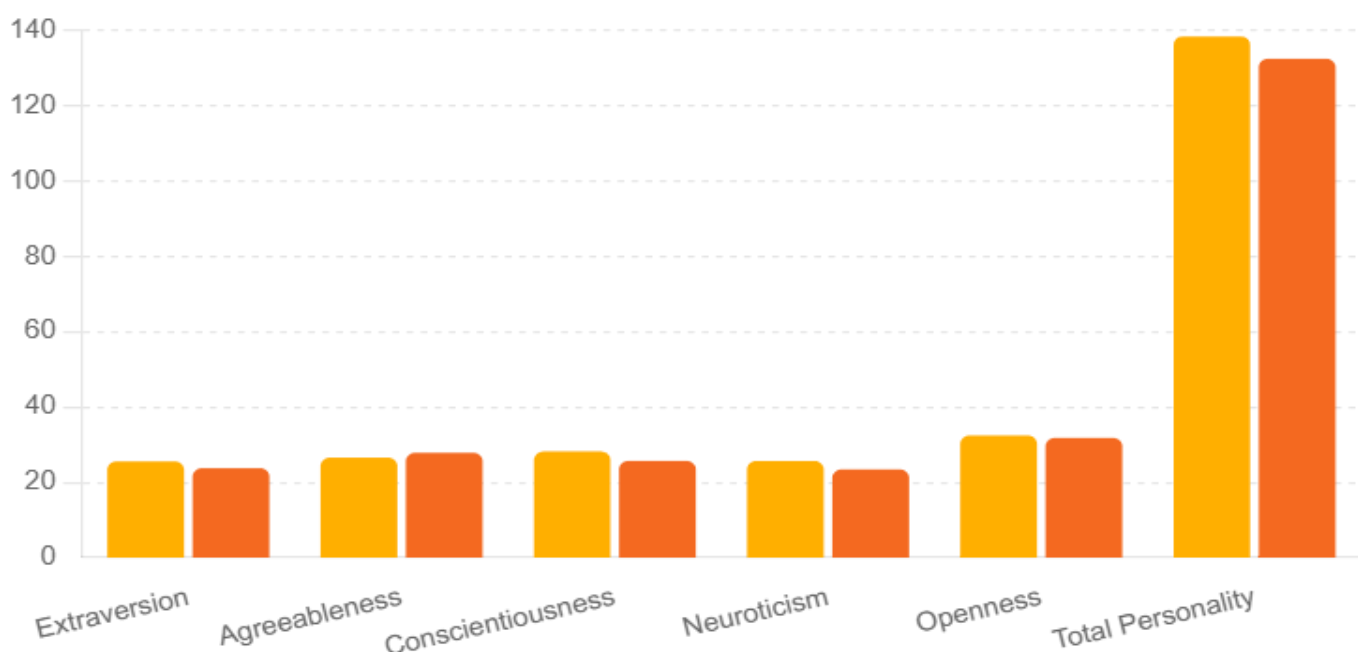


Figure 2 shows the mean values of personality traits for male physical education students compared to those in other disciplines at the undergraduate level.

Table 2.3: presents a comparative analysis of personality traits between female physical education students and other discipline students' post-graduation

Variables	Physical Education Students (N=20)		Non-Physical Education Students (N=20)		t- ratio
	Mean	S.D.	Mean	S.D.	
Extraversion	25.53	15.26	25.36	9.35	0.14
Agreeableness	29.95	5.10	30.89	4.43	1.35
Conscientiousness	28.9	11.46	25.35	12.76	3.22**
Neuroticism	24.55	14.99	23.45	6.89	1.05
Openness	39.2	707.5	33.9	6.83	0.89
Total Personality	142.2	54.37	138.55	61.52	1.52

*Significant at .05 level (t=2.02), **Significant at .01 level (t=2.70), df =38

The comparison between the male physical education students and the students in other fields at the postgraduate level suggests that the significant difference happens only in the trait of conscientiousness, where the female physical education students are characterised as having higher levels of responsibility, self-discipline and goal orientation. The researchers did not identify a statistically significant difference in other traits, such as extraversion, agreeableness, neuroticism, openness and total personality scores, indicating that both groups tend to behave similarly in these areas. In sum, these findings indicate that academic discipline might not have much effect on the majority of personality traits of the female population at the postgraduate level, but training in physical education could be related to increased levels of conscientiousness.

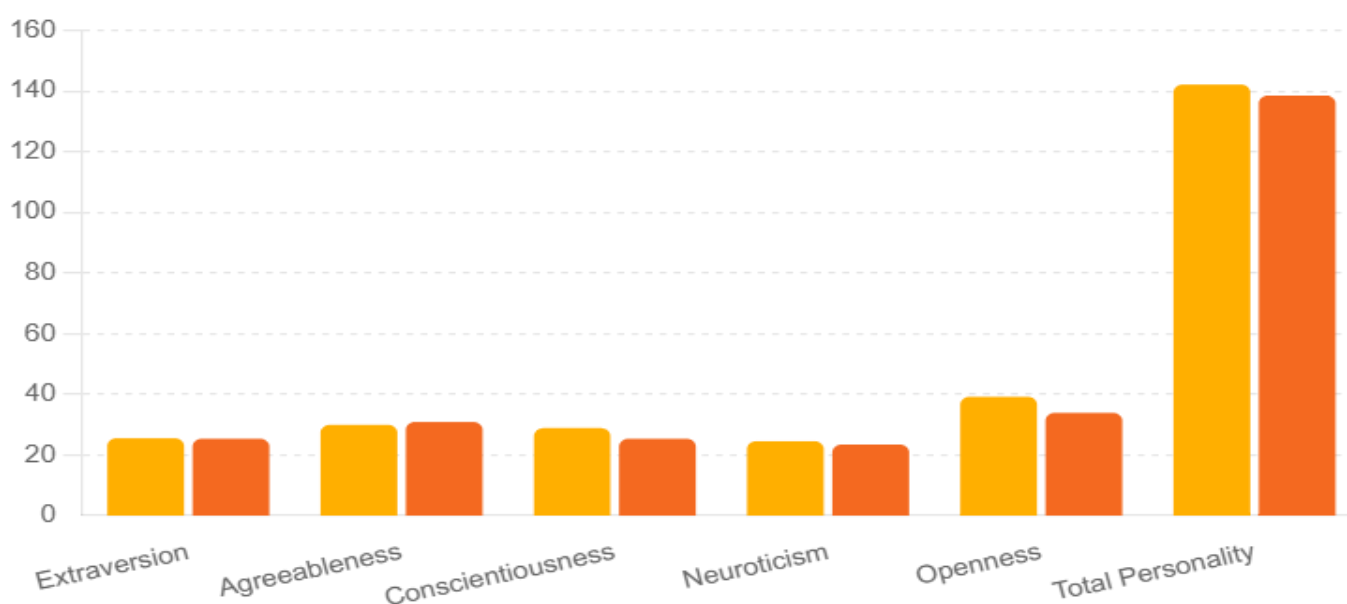


Figure 3 shows the mean value Personality Traits between Female Physical Education Students and Other Discipline Students of Post Graduation

Table 1.4: presents a comparative analysis of Personality traits between Female Physical Education Students and Other Discipline Students of Under Graduation

Variables	Physical Education Students (N=20)		Non-Physical Education Students (N=20)		t- ratio
	Mean	S.D.	Mean	S.D.	
Extraversion	24.85	6.45	25.75	7.04	1.09
Agreeableness	27.35	5.61	27.32	13.29	0.21
Conscientiousness	28	8.10	26.8	11.22	1.22
Neuroticism	26.9	5.25	25.15	8.98	2.07*
Openness	32.4	7.2	30.8	6.69	1.91
Total Personality	138.3	25.38	137.25	37.67	0.59

*Significant at .05 level (t=2.02), **Significant at .01 level (t=2.70), df =38

The comparison of female students of physical education and non-physical education students at the undergraduate level demonstrates that only one of the traits stands out as significantly different between the two groups, which is in the case of neuroticism. The results of physical education female students showed more representability with this trait, denoting that the female student might be slightly higher in emotionality or responsive in nature than others who belong to other fields. In other traits like extraversion, agreeableness, conscientiousness and openness, everyone did not make a statistically significant difference, implying that these characteristics of personality are more or less the same despite the academic discipline. On balance, the results indicate that the distribution of personality uniformities was put to minimum differences between the two groups, with gender respondents commanding a slight inclination towards emotional responsiveness among the female students in physical education.

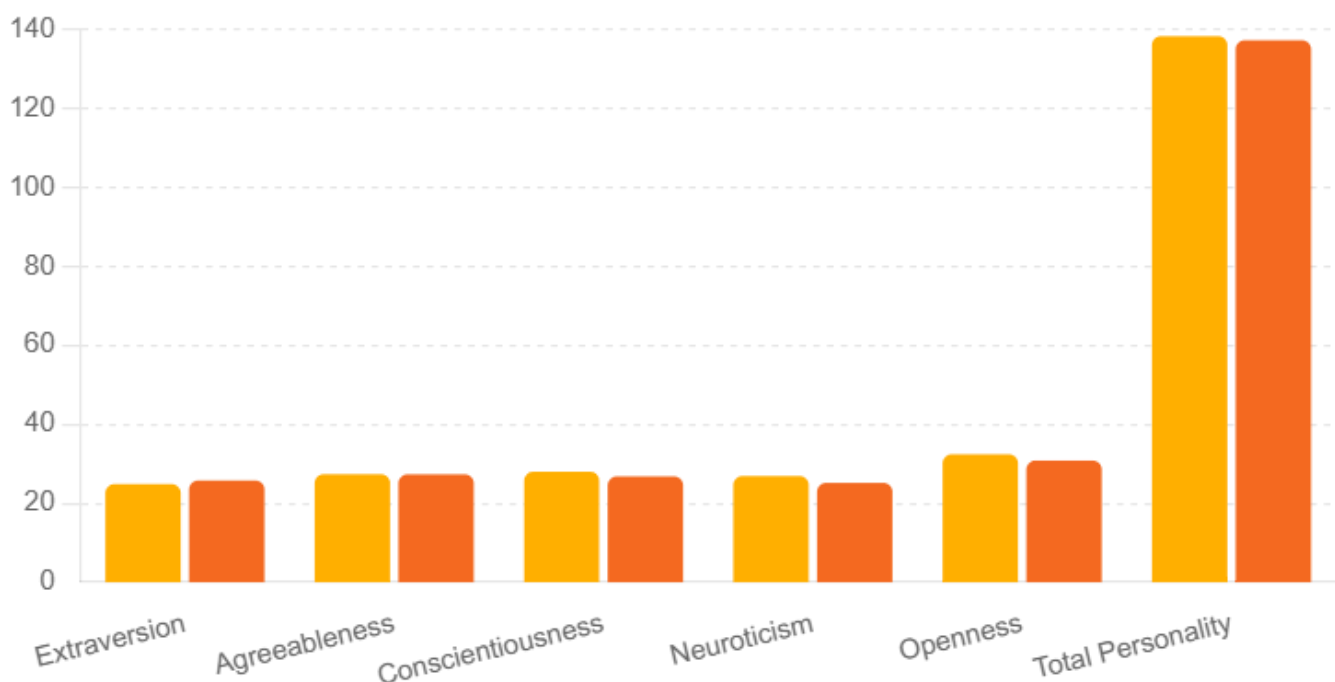


Figure 4 shows the mean value Personality Traits between Female Physical Education Students and Other Discipline Students of Under Graduation

3. DISCUSSION

The examination of personality traits among physical education students and those from other disciplines across both genders and academic levels reveals distinct trends. Physical education students scored significantly higher on extraversion, openness and total personality compared to other male postgraduates. Additionally, they exhibited much higher conscientiousness in the same category. In contrast, undergraduates showed much higher levels of extraversion, conscientiousness, neuroticism and total personality, resulting in a broader spectrum of differences. In the female postgraduates, the only trait that was significantly more prominent was conscientiousness and those characteristics implied more responsibilities and self-control in the female postgraduates, as compared to neuroticism that was found to be significantly more in the undergraduate level, which implied a slightly more emotional individual. Male PE students would have higher extraversion than sociability and assertiveness, as males were more socially and assertive than physically active groups, as reported by other researchers (Kuushnierz et al., 2020; Schmidt & Kruger, 2023). On the same note, greater conscientiousness among male and female learners in PE at some educational levels suggests a relationship between enhanced physical activities, self-control and goal-oriented behaviour (Sutin et al., 2018). This, however, provides an explanation as to why neuroticism would be identified as higher among students pursuing the PE undergraduate field than people not studying in this field, as the performance demands and competition rate are especially high at this stage of the academic development, along with the transitional stressors that individuals face at this age (Piepiora & Naczyńska, 2023). The developmental stage and sociocultural expectations are possible moderators of the influence of activity-based learning on personality, as indicated by gender-specific patterns here. Although considerations of the male PE students reveal clear advantages in terms of their regular social and self-regulatory choices, the female students in PE are seen to be more selective on the trait level, showing higher associations with conscientiousness emerging on the postgraduate level. This variation may be attributed to the heightening of academic responsibility and the training of a student studying advanced degrees. Naturally and practically speaking, the findings also point to the possibility of implementing more comprehensive education programs with a focus on incorporating structured physical and collaborative activities to instill desirable traits like sociability, self-control and openness to experience. Meanwhile, some groups of people are highly neurotic, which is why it is necessary to consider a balance between the high competition-performance expectations and psychological support measures. Future studies are needed to further document longitudinal designs to identify the causal pathways of academic discipline and activity-based learning and personality changes with time, as well as cultural dimensions and the importance of previous athletic experience. This work aims to clarify whether the differences observed are due to self-selection for PE programs or the influence of the PE learning environment on developmental outcomes.

4. CONCLUSION

As the study at hand shows, both academic discipline and gender influence the personality profile of the university students in the most subtle manner. At both the undergraduate and postgraduate levels, students in male physical education (PE) classes scored higher than their non-PE class counterparts on extraversion and conscientiousness, which are aspects of characteristics of high social ability, aggressiveness and self-control. The similar levels of neuroticism observed in the male PE undergraduate demographic suggest that excessive participation in physical training may contribute to increased emotional or stress reactivity during early adulthood. In contrast, female PE students differed from female non-PE students in a more limited manner: at the postgraduate level, females in PE demonstrated significantly higher conscientiousness (indicating greater goal orientation and self-control), while at the undergraduate level, they reported slightly elevated neuroticism and neurological sensitivity. Such trends agree with longitudinal research that high-moderate-to-vigorous physical exercise promotes extraversion and conscientiousness and decreases neuroticism over the long term, with cross-sectional reports showing greater social engagement and

discipline in athletes and PE majors. The larger implication is that socially interactive curricula that are embodied do not just appeal to student populations who happen to have certain dispositional strengths; the present alignment of embedded social interaction also actively develops characteristics or traits, namely conscientiousness and extraversion, that are more likely to promote academic achievement, coachability and the adoption of healthy lifestyle behaviours throughout the entire lifetime. Zap claims, however, that there are gender- and level-dependent differences: Boys overall seem to benefit from PE exercise in regard to physical development while girls appear to derive benefits from a personality perspective. Additionally, undergraduate students' temporary emotional turbulence suggests avoiding a universal interpretation.

In this context, educators and curriculum designers should consider incorporating a structured, activity-based component across various disciplines to encourage positive personality development; therefore, interventions must be tailored to gender and developmental stage. The next studies will also need to separate the pathways through which physical education results in changes to dispositional development, referring to larger, more diverse samples and longitudinal designs in future studies.

REFERENCES

- [1] Islam, Z. U., & Waheed, A. (2016). A comparative study of personality characteristics among physical education and non-physical education college students. *International Journal of Education and Science Research Review*, 2(6), 72–75. <http://www.ijesrr.org>
- [2] Kokkinos, C. M., Antoniadou, N., & Voulgaridou, I. (2024). Majors unleashed: Unravelling students' personality profiles across academic disciplines. *Current Psychology*, 43, 17635–17645. <https://doi.org/10.1007/s12144-024-05721-2>
- [3] Kumar, A. (2022). Comparative study of personality traits and self-esteem of physical education teachers and other subject teachers of Himachal Pradesh. *International Journal of Food and Nutritional Sciences*, 11(11). Retrieved from <https://www.ijfans.org/issue-content/comparative-study-of-personality-traits-and-self-esteem-of-physical-education-teachers-and-other-subject-teachers-of-himachal-pardesh-2659>
- [4] Kuśnierz, C., Rogowska, A. M., Ochnik, D., & Władysław, B. (2020). Examining gender differences, personality traits, academic motivation and academic performance in Polish and Ukrainian physical education students. *International Journal of Environmental Research and Public Health*, 17(16), 5726. <https://doi.org/10.3390/ijerph17165726>
- [5] Mishra, P. K. (2016). A comparative study on personality traits of bachelor of physical education and bachelor of education students. *International Journal of Multidisciplinary Research and Development*, 3(12), 70–71.
- [6] Müller, C. (2023). Personality traits and physical activity: Insights from German university students. *European Journal of Investigation in Health, Psychology and Education*, 13(8), 1423–1440. <https://doi.org/10.3390/ejihpe13080104>
- [7] Opoku, O. G., Adamu, A., & Opoku, D. (2023). Relation between students' personality traits and their preferred teaching methods: Students at the University of Ghana and the Huzhou Normal University. *Heliyon*, 9(1), e13011. <https://doi.org/10.1016/j.heliyon.2023.e13011>
- [8] Piepiora, P., & Naczyńska, A. (2023). Personality traits vs. sports classes of Polish representatives in junior sports acrobatics. *Sports*, 11(10), 194. <https://doi.org/10.3390/sports11100194> MDPI+1

- [9] Rezaei Talyabee, S., Soleimane Moghadam, R., & Salimi, M. (2013). The investigation of personality characteristics in athlete and non-athlete students. *European Journal of Experimental Biology*, 3(3), 254–256. Retrieved from <https://www.primescholars.com/articles/the-investigation-of-personality-characteristics-in-athlete-andnonathlete-students.pdf>
- [10] Schmidt, R., & Kruger, W. (2023). Personality traits and physical activity: Insights from German university students. *International Journal of Behavioral Nutrition and Physical Activity*, 20(1), 73. <https://doi.org/10.1186/s12966-023-01424-y>
- [11] Sethi, P. K., & Mehta, V. (2020). Topography of personality traits among university students pursuing different interest. *Journal of Sports Science and Nutrition*, 1(2), 29–31.
- [12] Sutin, A. R., Stephan, Y., Luchetti, M., Artese, A., & Terracciano, A. (2018). Physical activity and personality development over twenty years: Evidence from three longitudinal samples. *Journal of Research in Personality*, 72, 162-170. <https://doi.org/10.1016/j.jrp.2017.08.002>
- [13] Yang, J.-H., Yang, H. J., Choi, C., & Bum, C.-H. (2024). Relationship between athletes' Big Five model of personality and athletic performance: Meta-analysis. *Behavioral Sciences*, 14(1), 71. <https://doi.org/10.3390/bs14010071>

Received: 18.07.2025Accepted: 16.09.2025Published: 25.09.2025Page No: 21 – 25DOI: [10.5281/zenodo.17206409](https://doi.org/10.5281/zenodo.17206409)✉: gkujournal@gku.ac.in

The Efficacy of Yoga in Managing Arthritis: A Review of Evidence-Based Studies

¹Ms. Sakshi Nagru, ²Mr. Gurdeep Singh^{1,2}Assistant Professor, Faculty of Physical Education, Guru Kashi University Talwandi Sabo, BathindaEmail ID – ¹drsakshinagru172117@gku.ac.in, ²gurdeepsingh@gku.ac.in

Abstract – Arthritis is one of several prevalent chronic diseases that affect millions of individuals. It causes joint inflammation. Pain, swelling, stiffness and restricted motion are the salient symptoms. These problems can interfere with daily activities and decrease the quality of life. Old-school remedies such as drugs and physical therapy can produce results, but many patients are seeking alternatives. The therapeutic effect of yoga, including physical postures in combination with breath and meditation, is increasingly recognized. The purpose of this review article is to summarize evidence for yoga for arthritis. And its influence on pain, physical function, mental health, range of motion, muscle strength is summarized by the literature review.

Keywords – Arthritis, Yoga Therapy, Osteoarthritis, Rheumatoid Arthritis, Complementary Medicine

1. INTRODUCTION

Osteoarthritis (OA) and rheumatoid arthritis (RA) are two kinds of inflammatory arthritis that individuals often experience. There are over 100 other types of arthritis as well. These conditions lead to joint pain, stiffness, swelling, and limited movement. They may impact on activities of daily living and quality of life. Most commonly, osteoarthritis is due to joints wearing out over time. Rheumatoid arthritis, in contrast, is an autoimmune disease-causing joint damage and inflammation. (1) Both strains have put a significant strain on people and their ability to cope as well as the entire world's health infrastructure.

Such conditions are commonly managed with drugs, physiotherapy and when necessary, surgery (for example of arthritis). And while such approaches can control the disease and slow its advance, there are trade-offs. Long-term medication use may cause side effects, and surgery can be expensive and invasive. Consequently, many are looking for alternative and non-medication treatments for a safe and effective way to handle their ailments. Yoga has become an attractive choice.

Yoga is a method of mental and physical practice, which includes regulated respiration, meditative exercises with distinct body postures. It overly promotes alignment, flexibility and relaxation, so it is perfect for the joints challenged. Yoga is a relatively low-impact exercise that can enhance function, build muscle strength, reduce pain and improve flexibility in individuals with arthritis. Its emphasis on reducing stress and promoting overall mental health might also help people better manage their negative feelings about living with chronic pain.

In this essay I explore evidence that has emerged over the past decade related to the benefits of practicing yoga for individuals with arthritis regarding management and relief of pain, increased mobility and muscle strength, as well as improved quality of life.

Literature Review on Arthritis and Yoga

Author/Year	Focus of Study	Main Results	Implications for Management of Arthritis
Sharma & Haider (2013)	Yoga for complementary therapy in chronic diseases	Fostering stress reduction and quality of life among sufferers of chronic illnesses	Effectiveness of Yoga on emotional well-being of patients with arthritis.
Bosworth et al. (2014)	Mind–body interventions for arthritis	Participants found reduced pain and better mental health management	Yoga may be best suited as an adjunct factor for treating the physical and psychological components of arthritis.
Cramer et al. (2013)	Meta-analysis of yoga for osteoarthritis and rheumatoid arthritis	Pain significantly reduced, joint function improved	Yoga as a complementary therapy that is safe and effective.
Garfinkel et al. (1994)	Yoga for hand osteoarthritis	Increased muscle power and decreased pain when using yoga regularly	The Yoga technique ensures increased power and joint mobility.
Kolasinski et al. (2005)	Utilization of yoga for the treatment of patients with osteoarthritis of the knees	Stiffness, pain, and physical function improved to a statistically significant level	Shows how yoga can enhance flexibility and functional activities.
Ebnezar et al. (2011)	Yoga vs physiotherapy in OA patients	Pain scores and joint flexibility improved significantly in the yoga group	Yoga may be just as effective or better than traditional physiotherapy.
Telles et al. (2012)	Yoga and inflammatory markers	Decreased stress, lowered inflammatory markers after yoga practice	Supports yoga's potential impact in decreasing even inflammation in arthritis.

Arthritis is a very painful disorder that only becomes worse as it has a degenerative effect on the body's cartilages. Rheumatoid arthritis, or RA for short, is a disease that causes inflammation in the joints and can lead to deformities. OA is one of the most prevalent joint disorders, it is a degenerative pathology frequently occurring in the hands, knees and hips. Typical symptoms of both conditions are pain, swelling, limitation with movement and restricted mobility which can cause disruption of daily life and carry psychological stress.

Yoga is acknowledged as an effective adjunctive treatment. It can help relieve stress, enhance flexibility and strength in the joints/muscles and aid in concentration with a combination of deep breathing, relaxation techniques and slow movements. Studies have shown that yoga can not only ease the pain, but also improve mental health and function among arthritis sufferers.

2. METHODOLOGY

For patients with arthritis, a recently published review of RCTs, observational studies and meta-analyses examined the efficacy of yoga. Key measures in the results include:

- Pain reduction
- Joint flexibility
- Strength and balance
- Improvement in mental health (anxiety, depression, and stress)

3. RESULTS

Study	Type of Arthritis	Study Design	Duration	Participants	Key Outcomes
Gothe et al. (2016)	Osteoarthritis (OA)	Randomized Controlled Trial (RCT)	8 weeks	50	Reduction in pain that is significant, improvement in knee flexibility, and enhancement in quality of life
Cramer et al. (2013)	Rheumatoid Arthritis (RA)	Systematic Review	Varies	Multiple studies	Yoga improves joint mobility, reduces pain, and boosts emotional well-being
Mino et al. (2014)	OA and RA	Observational Study	12 weeks	100	Increase physical function, reduced fatigue, and lower levels of depression
Field et al. (2011)	Osteoarthritis (OA)	RCT	6 weeks	60	Increased range of motion, decreased joint stiffness, and pain relief in participants
Siegel et al. (2017)	Mixed (OA and RA)	Longitudinal Study	16 weeks	150	Reduced inflammation markers, enhanced joint mobility, and improved mental health outcomes

4. DISCUSSION

4.1 Pain Management.

Yoga has been shown to help patients with rheumatoid arthritis and osteoarthritis. It relaxes the muscles around the joints. The gentle stretching and strengthening postures reduce discomfort. Breathing techniques are also important. They activate the parasympathetic nervous system, which helps manage pain.

4.2 Increased Flexibility and Strength

Regular yoga practice can make the muscles and joints more flexible. This may improve range of motion and reduce stiffness. Additionally, strengthening poses can support the joints. This support increases stability and lessens wear and strain on the joints.

4.3 Mental Health Benefits

Arthritis can negatively impact mental health and often leads to feelings of worry and despair. This happens because the condition causes chronic pain and reduces mobility. Specifically, when combined with mindfulness and meditation practices, yoga can help reduce stress and improve overall mental health. Current research shows that yoga can relieve both psychological and physical symptoms.

4.4 Accessibility and Safety

Flexibility is one of the biggest benefits that yoga provides. Most yoga poses can be changed to suit people with different levels of mobility. Chair yoga has also grown in popularity as an option for individuals with severe arthritis.

5. APPENDICES

Table 2: Yoga Poses Beneficial for Arthritis

Yoga Pose	Benefits	Modifications
Downward Dog	Stretches hamstrings, calves, and spine	Can be done with knees bent to reduce pressure
Warrior II	Strengthens legs and opens hips	Use a chair for support or reduce depth of lunge
Child's Pose	Gently stretches the back and relieves tension	Can be done with a cushion under the chest
Cat-Cow Stretch	Increases flexibility in the spine	Perform slowly and gently, avoid overextending
Seated Forward Bend	Stretches the back and legs	Sit on a cushion for more comfort

6. CONCLUSION

According to what we know, yoga has been proved to be a beneficial treatment for individuals with arthritis. Yoga can make a big difference to symptoms like pain and stiffness. It does also help in strengthening and flexibility of the joints. The ritual also promotes mental health, which is frequently compromised by chronic illness. Larger sample sizes and continued practice are needed to fully understand the role of yoga in RA management.

7. RECOMMENDATIONS

- **Integrating with Arthritis Care Plans:** Yoga needs to be included in all arthritis care plans, in addition to the usual practices.
- **Targeted Yoga Programs:** It is best if custom yoga programs that offer individualized attention to needs of participants are developed, especially for people with serious joint problems.
- **More study:** Further research should explore whether the improvements in symptoms from yoga persist over time, and examine its effects on other forms of arthritis, such as psoriatic arthritis.

REFERENCES

- [1] Bartlett, S. J., Moonaz, S. H., Bernatsky, S., Dey, A., & Lawson, K. (2013). Yoga in sedentary adults with arthritis: Effects on quality of life, function, pain, and psychosocial outcomes. *Current Rheumatology Reviews*, 9(6), 539-549.
- [2] Cramer, H., Lauche, R., Haller, H., Dobos, G. (2013). Yoga for rheumatoid arthritis: A systematic review. *Clinical Rheumatology*, 32(6), 791-798.
- [3] Curtis, K., Osadchuk, A., & Katz, J. (2011). An overview of yoga research for people with arthritis. *International Journal of Yoga Therapy*, 21(1), 27-32.
- [4] Ebnezar, J., Nagarathna, R., Yogitha, B., & Nagendra, H. R. (2012). Effect of integrated yoga therapy on pain, morning stiffness, and anxiety in osteoarthritis of the knee joint: A randomized control study. *International Journal of Yoga*, 5(1), 28-36.

- [5] Field, T., Hernandez-Reif, M., & Diego, M. (2011). Osteoarthritis and yoga: Effects on joint pain and functioning. *The Journal of Alternative and Complementary Medicine*, 17(7), 577-582.
- [6] Garfinkel, M. S., Schumacher, H. R., Husain, A., Levy, M., & Reshetar, R. A. (1994). Evaluation of a yoga-based regimen for treatment of osteoarthritis of the hands. *Journal of Rheumatology*, 21(12), 2341-2343.
- [7] Gothe, N. P., Pontifex, M. B., & McAuley, E. (2016). Yoga and osteoarthritis: A review of the literature. *Journal of Pain Research*, 9, 209-218.
- [8] Hagen, K. B., Byfuglien, M. G., Falzon, L., Olsen, S. U., & Smedslund, G. (2012). Stretching and strengthening exercises versus arthroscopic surgery for osteoarthritis of the knee: A systematic review. *BMJ Open*, 2(5), e002947.
- [9] Kolasinski, S. L., Garfinkel, M., Tsai, A. G., Matz, W., Van Dyke, A., & Schumacher, H. R. (2005). Iyengar yoga for treating symptoms of osteoarthritis of the knees: A pilot study. *Journal of Alternative and Complementary Medicine*, 11(4), 689-693.
- [10] Mino, S., Watanabe, T., & Sato, K. (2014). The effects of yoga on physical and psychological health in patients with arthritis. *Psychology of Sport and Exercise*, 15(2), 237-244.
- [11] National Center for Complementary and Integrative Health (NCCIH). (2019). Yoga: In depth. Retrieved from <https://www.nccih.nih.gov>
- [12] Park, C. L., Groessl, E., Maiya, M., Sarkin, A., Eisen, S. V., Riley, K., & Elwy, A. R. (2014). Comparison groups in yoga research: A systematic review and critical evaluation of the literature. *Complementary Therapies in Medicine*, 22(5), 920-929.
- [13] Siegel, M., & Forsyth, R. (2017). The impact of yoga on arthritis: A longitudinal study. *Journal of Complementary Therapies in Clinical Practice*, 23(2), 85-91.
- [14] Wang, C., Schmid, C. H., Hibberd, P. L., Kalish, R., Roubenoff, R., Rones, R., & McAlindon, T. (2009). Tai Chi is effective in treating knee osteoarthritis: A randomized controlled trial. *Arthritis & Rheumatism*, 61(11), 1545-1553.
- [15] Woodyard, C. (2011). Exploring the therapeutic effects of yoga and its ability to increase quality of life. *International Journal of Yoga*, 4(2), 49-54.

Received: 07.08.2025Accepted: 16.09.2025Published: 25.09.2025Page No: 26 – 31DOI: [10.5281/zenodo.17206460](https://doi.org/10.5281/zenodo.17206460)✉: gkujournal@gku.ac.in

Impact of Swimming on The Cardiovascular Endurance of School Student

¹Mr. Dusyant, ² Dr. Jaswinder Singh¹M.P.Ed. Research Scholar, Guru Kashi University, Talwandi Sabo, Bathinda, Punjab²Associate Professor, Faculty of Physical Education, Guru Kashi University, Talwandi Sabo, Bathinda, PunjabEmail: 2drjaswindersingh@gku.ac.in

Abstract – *The purpose of this study was to determine the effects of swimming on cardiorespiratory endurance for secondary school students. The authors speculated that swimming would result in a high cardiorespiratory endurance. Twenty young male swimmers (15-18 years old) were included in the study. Participants were recruited on a random basis from Mayur Swimming Pool, Mahendergarh (Haryana). The sample included male high school students. Cardiorespiratory endurance was measured by the Harvard Step Test at preintervention and postintervention after 6 weeks of swimming training. Subjects were divided into groups, those who underwent swimming training (Experimental group, n = 10) and subjects that did not undergo any training (control group n = 10). Data were analyzed using paired t-test. Results that indicated a significant increase in the cardiovascular endurance of the experimental group and as such revealed an overall positive impact of the swimming training program on participants.*

Keywords: *Cardiovascular Endurance, Swimming, Secondary School Students*

1. INTRODUCTION

Swimming is one of the earliest recorded forms of exercise; for example, it has been practiced since prehistoric times in these ancient references contain those to swimming such as in historical biblical and Grecian texts. Swimming was widely practiced in ancient civilizations including the Egyptians, Greeks and Romans. It was in the outset considered more as a survival skill than a sport or leisure activity, and part of military training. Warrior skills This was an essential skill of a warrior and highly prized as it could save a life in warfare.

Continuous Progress in Our Fast-Paced World In our competitive and fast-paced world of today, constant progress and development cannot be overstated. The human race is seeking a superior living condition, which tends to be promoted by advanced with science and technology. Maintaining a Healthy Heart, the capacity of the heart and lungs to collaborate in supplying oxygen to the body's big muscles throughout extended durations of strenuous exercise is known as cardiovascular endurance. These activities included swimming, jogging, cycling and walking. Commonly referred to as cardiovascular endurance, aero capacity or cardio-respiratory fitness – it is the ability to train the body for a prolonged period of time and demands great adjustment from both the circulatory and respiratory system.

2. METHODOLOGY

The subjects of the present investigation were the male swimmers from secondary schools of Mayur Swimming pool, Mahendergarh (Haryana). A sample of 20 male swimmers, aged between 15 and 18 years

old, was randomly chosen through simple random sampling. Cardiovascular Endurance-Criterion: I-IOP and BADG against a health-related criterion measure of cardiovascular endurance, the Harvard Step Test.

The main purpose of the research was to investigate the influence of swimming towards cardiovascular endurance of secondary school students. "It should give swimming coaches and competitive swimmers some useful information about what cuts resting blood pressures, though I believe other types of aerobic activity are better for developing the cardiovascular system." It was hypothesised that swimming would significantly improve cardiovascular endurance in male secondary school students.

Table 1 Cardio-Vascular Endurance between Pre and Post Test of Control Group

Control Group	Mean	S.D.	M.D.	O.T.
Pre. Test	91.88	4.52	2.41	0.22
Post Test	94.29	3.96		

Interpretation:

Table 1 demonstrates that although there is an increase in the mean value from the pre-test (91.88) to the post-test (94.29), the mean difference (M.D.) is 2.41. A *t*-test was applied to determine the statistical significance of this change. The computed *t* value, *t* (0.22) was less than cvt of 2.26 at 5% level of significance. Therefore, the improvement in cardiovascular endurance within the control group is not statistically significant, as no structured training was provided to these participants.

Graph 1 Graphical Representation of Cardio-Vascular Endurance between Pre and Post Test of Control Group

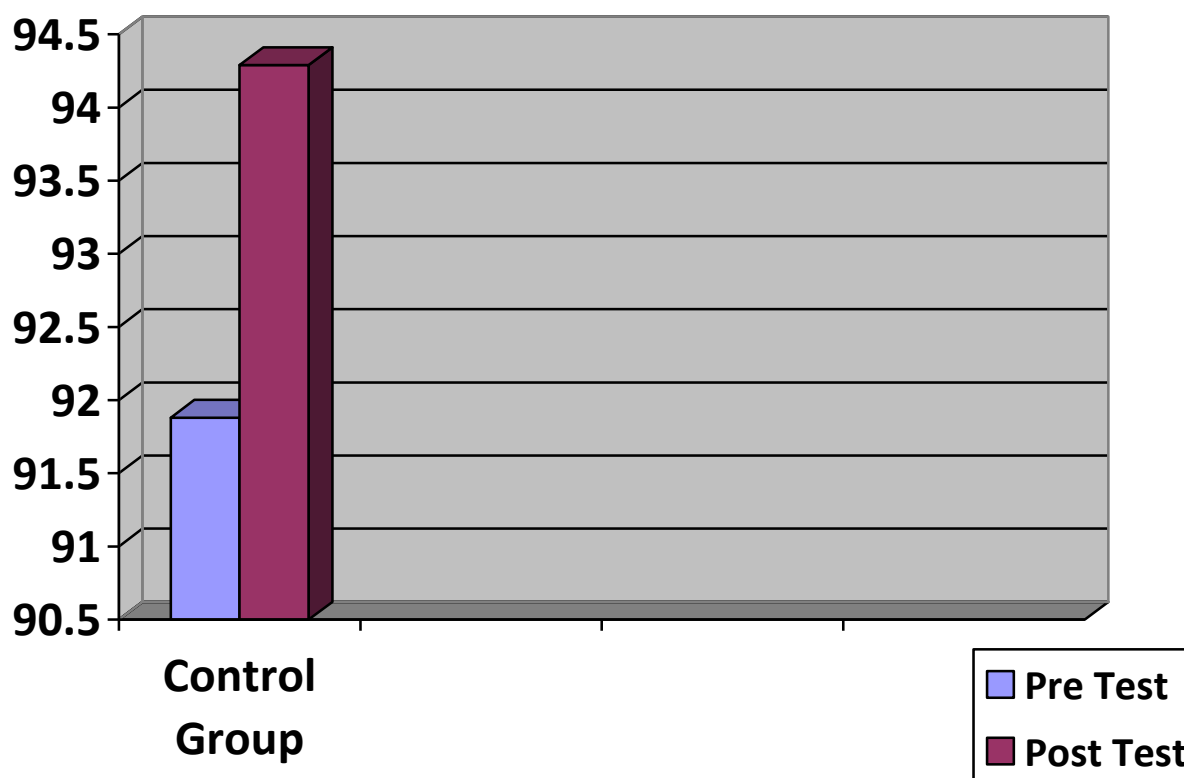


Table 2 Cardio-Vascular Endurance between Pre and Post Test Of Experimental Group

Experimental Group	Mean	S.D.	M.D.	O.T.	T.T.
Pre Test	94.19	2.68	18.5	3.54	2.26
Post Test	112.69	10.4			

Table 2 Shows that there is a significant difference between the means of pre- and posttest among the experimental group. The means were raised from 94.19 to there being a 112.69; average difference of points, in Youmans' name. At the .05 level of significance, there is evidence to reject the null hypothesis because the obtained t value of 3.54 is greater than critical t 2.26. This is evidence that the 6-week swimming program had greatly enhances cardiovascular endurance.

Graph 2 Graphical Representation of Cardio-Vascular Endurance Comparison between Pre and Post Test of Experimental Group

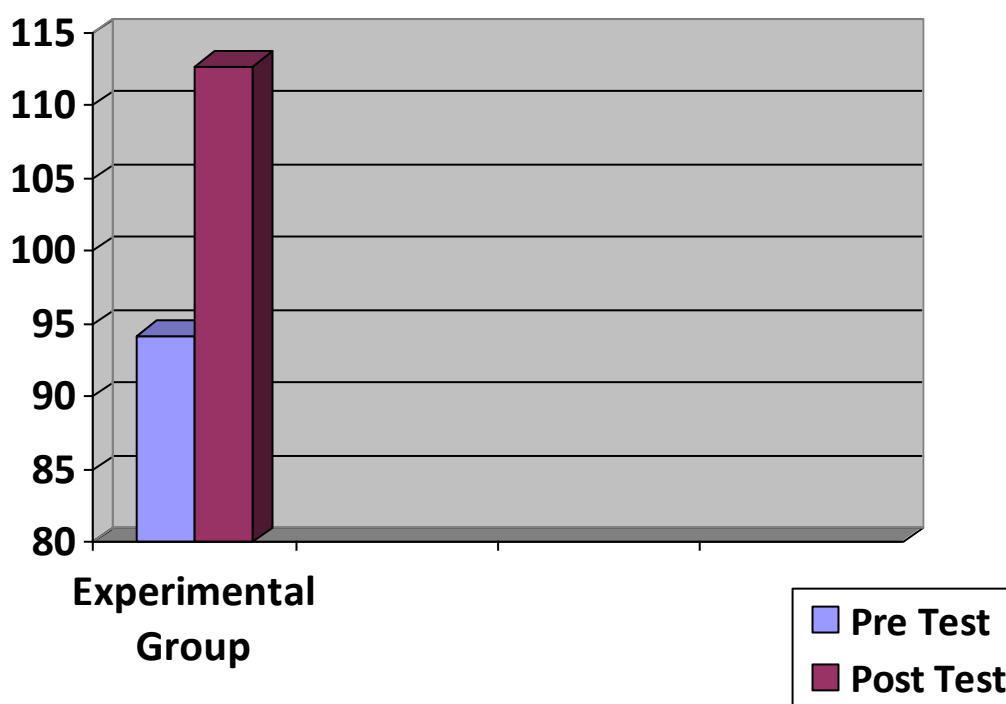


Table 3 : Cardio-Vascular Endurance between Post Test of Control and Experimental Group

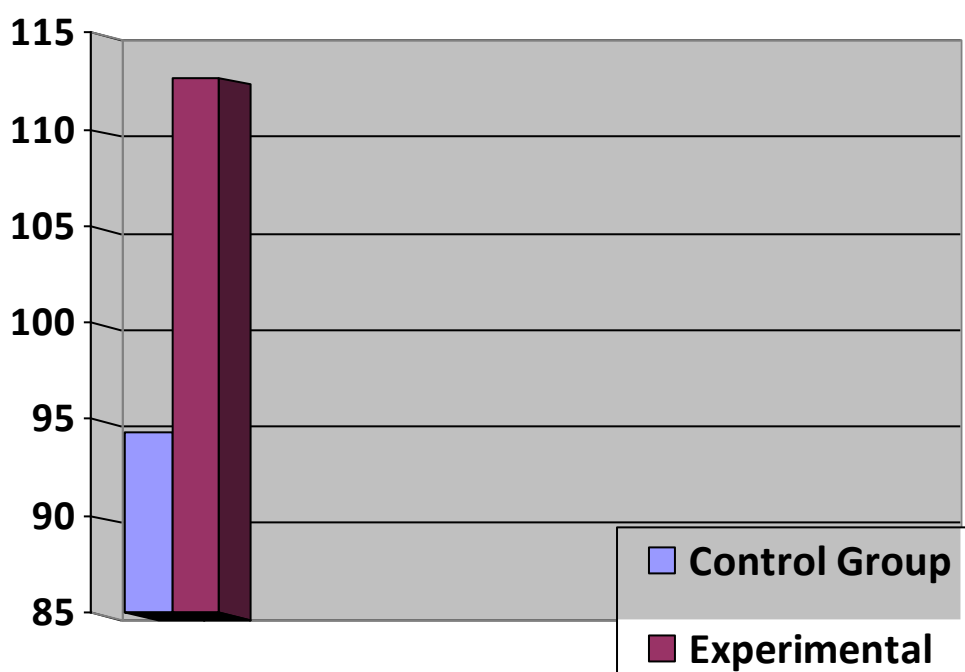
Group	Mean	S.D.	M.D.	O.T.	T.T.
Control	94.29	3.96	18.4	5.69	2.1
Experimental	112.69	10.4			

Interpretation:

Table 3 indicates a considerable difference between the post-test means of the control and experimental groups. The control group achieved an average score of 94.29 and the experimental group scored

significantly higher with a mean value of 112.69 (mean difference = 18.4). The obtained t- value is 5,69 which exceeds from the critical value of t is at the.05 confidence level. This indicates a measurable enhancement of the cardiovascular endurance in to the subjects of experimental group who have participated in swimming program for six weeks in comparison with the control group.

Graph 3 Graphical Representation of Cardio-Vascular Endurance between Post Test of Control Group and Experimental Group



Discussion of Findings

The analysis of the obtained data reveals a statistically significant enhancement in cardiovascular endurance among participants subjected to the swimming training regimen. This confirms that the structured six-week swimming program had a positive and measurable impact. The intervention effectively enhanced the cardiovascular capabilities of secondary school students.

Justification of Hypothesis

Originally, it was hypothesized that swimming would have marked effects with respect to cardiovascular endurance. Based on the findings of this research, this hypothesis is validated and accepted. It should be noted that many conventional cardiovascular endurance assessments were originally designed for clinical diagnostics and may not be entirely suitable for evaluating fitness levels in healthy and active adolescents.

Discussion of Findings

Analysis of the collect data shows that there is highly significant increase in cardiovascular endurance on swimming training. This gives an indication that the structured six weeks swimming practice was effective. The intervention improved the cardiovascular fitness of high-school students.

Justification of Hypothesis

The initial hypothesis posited that swimming would have a significant influence on cardiovascular endurance. The results of this study support this assumption, leading to the acceptance of the hypothesis.

Certainly, it should be noted that many of the cardiovascular endurance tests were originally developed by physicians to diagnose medical disorders and are essentially screening tools. These tests do not necessarily provide a complete assessment of cardiovascular fitness in healthy, active young people.

The principal aim of this research was to evaluate the impact of swimming on the cardiovascular endurance of secondary school students. Results demonstrated a significant improvement, indicating that the 6-week swimming program successfully increased the MVIC of subjects.

3. CONCLUSION

This research proved that a six-week- swimming program has great effect on cardiovascular endurance in high school boys. In the experimental group, which conducted swimming training, endurance differences in comparison to the control were pronounced, indicating beneficial effects of swimming on cardiovascular status. As an aerobic activity, swimming provides good conditioning for the heart and the lungs, thus making it a suitable modality to maintain cardiovascular fitness among students. Swimming is also low-impact thus less hazardous to injuries and can be a good sport for the young. This study favors the argument of introducing swimming in school physical education programs to help improve cardiovascular health. Conclusions Taking into account the beneficial outcomes, swimming is recommended as an enjoyable and effective form of exercise for endurance enhancing activities. It may be an area of additional investigation to examine the long-term impact of swimming and the benefits in younger or other sex groups as well to further prove it as an effective stimulant of cardiovascular health.

REFERENCES

- [1] Altonso L. Garay et.al; (1974), Genetic And Anthropological Studies Of Olympic Athletes, (New York : Academic Press), p. 73.
- [2] C. A. Bucher, (1960), Foundation of Physical Education, (St. Louis: The C. V. Mosby Co.), p. 26.
- [3] Carpenter, (1938) Ajmer Singh et.al; Essentials Of Physical Education, (Ludhiana: Kalyani Publishers, 2008), Vol. 9, No. 3, pp. 13-14.
- [4] Deborah B. Dowdy, et.al; (1985), "Effect Of Aerobic Dance On Physical Work Capacity, Cardiovascular Function And Body Composition Of Middle Aged Women", Research Quarterly, Vol. 56, No. 3, p 127.
- [5] Devinder K. Kansal, (2008), Textbook of Applied Measurement Evaluation & Sports Selection, (New Delhi: Sports & Spiritual Science Publications), p.272.
- [6] G. R. Jackson, (1968), "The Effect of Training at Three Different Heart Rate Level of Cardiovascular Fitness", Completed Research In Health Physical Education And Recreation, Vol. 10, No. 2, pp. 113-114.
- [7] Gutin B, et.al; (2002), Effects of exercise intensity on cardiovascular fitness, total body composition, and visceral adiposity in obese youths.;75: 818-826.
- [8] I. L. Swaine, et.al; (2010), "Reproducibility of Limb Power Outputs and Cardiopulmonary Responses to Exercise Using a Novel Swimming Training Machine", International Journal of Sports Medicine, Vol. 31, pp. 854-859.
- [9] I.G. Fatouros, et.al; (2002), "The Effects of Strength Training, Cardiovascular Training and Their Combination on Flexibility of Inactive Older Adults", International Journal of Sports Medicine, 23. Pp 112-119

- [10] L.M. Lemura, et.al; (2000), "The Effect of Physical Training On Functional Capacity In Adults", The Journal Of Sports Medicine And Physical Fitness, Vol. 40, No. 1, p. 1.
- [11] Majeed Aarif & Sayar P.S. (2022), A comparative study of Jammu and Kashmir college students regarding physiological components and physical fitness variables, International Journal of Physiology, Nutrition and Physical Education; 7(1), 354-357
- [12] Majeed Aarif & Sayar P.S. (2022), Comparative study of selected anthropometric measurements & physical fitness variables of college students of Jammu and Kashmir, B. Aadhar, Issue NO, 346 (CCCXLVI), 1-5.
- [13] Majeed Aarif & Sayar P.S. (2022), Comparison of selected physiological parameters and anthropometric measurements between college level students of two regions of Jammu and Kashmir, International Journal of Yoga, Physiotherapy and Physical Education, Volume 7, Issue 1, p.p 1-4
- [14] Majeed Aarif (2020), Effect of selected exercise on reaction time and agility of Athlete and non-athlete A comparative study. Ajanta, Vol IX (IV), 95-102.
- [15] Majeed Aarif (2021), Effect of selected Plyometric training on Arm and leg strength of volleyball players. International Journal of Health, Physical Education and Computer Science in Sports, Volume 43 (1), 34-36.
- [16] Majeed Aarif and Bhat Muzammil Ahmad (2019), Effect of Circuit training on Motor fitness components and skill ability of Kabaddi Players, International Journal of Psychosocial Rehabilitation, Vol 23 (06), 1896-1902.
- [17] Milton Hollenberg, et.al; (2002), "Oxygen Uptake Efficiency Slope: An Index of Exercise Performance and Cardiopulmonary Reserve Requiring Only Submaximal Exercise", Journal of American College of Cardiology, Vol. 36, pp. 194-201.
- [18] N. Whitehead, Conditioning for Sports (1975), (West Yorkshire: E. P. Publishing Ltd), p.12.
- [19] Parks, Chares James, (1980), "The Effects of A Physical Fitness Program On Body Composition, Flexibility, Heart Rate, Blood Pressure And Anxiety Levels Of Senior Citizens", Dissertation Abstracts International, Vol. 41, No.3, p. 1157.
- [20] Uppal A.K et.al; (1984), "Comparative effect of different frequencies of endurance training on cardio respiratory endurance", S.N.I.P. Es Journal, Vol.30, No. 7, pp.72-76.

Received: 07.08.2025Accepted: 16.09.2025Published: 25.09.2025Page No: 32 – 39DOI: [10.5281/zenodo.17206751](https://doi.org/10.5281/zenodo.17206751)✉: gkujournal@gku.ac.in

Effect of Some Selected Exercises on Flexibility and Coordination of Basketball Players

¹ Mr. Yogesh, ²Dr. Jaswinder Singh¹M.P.Ed. Research Scholar, Guru Kashi University, Talwandi Sabo, Bathinda, Punjab²Associate Professor, Faculty of Physical Education, Guru Kashi University, Talwandi Sabo, Bathinda, PunjabEmail: ¹drjaswindersingh@gku.ac.in

Abstract – This research measured the impact of 6 weeks of target training exercises on the flexibility and coordination of basketball players. The study included 30 basketball players, aged 18 to 25, from Guru Kashi University. Participants were randomly assigned to two equivalent groups: an experimental group and a control group. Participants were randomly assigned to experimental and control groups. The experimental group followed a lesson plan, while the control group continued as usual. Research was done using the Sit and Reach trunk flexibility and the Eye-Hand Coordination test to evaluate visual motor response, on the initial and final days of the training period. When doing the analysis of the data, the researcher used a t-test with a significance level of 0.05. The primary objective of the research was to investigate the impact that specific flexibility and coordination workouts have on the free trunk rotation and eye-hand coordination abilities of basketball players while they participate in the sport. The hypothesis that was made for the study was that aimed training designed for basketball players would positively and greatly impact both assess physical traits. This study was conducted only on male athletes at the Guru Kashi University Stadium. The subjects of the study were competing basketball players at the college, with trunk flexibility and eye-hand coordination being the variables of focus.

Keywords: Coordination, Basketball players, Training exercises, Trunk flexibility and eye-hand coordination.

1. INTRODUCTION

The different physical and technical aspects of every sport should be considered for designing optimal tactical and physical training. In basketball, some conditioning is gained from on-court activities during practices and tactical drills, but this is only a fraction of what should be done and is supplemented by off-court training. This off-court training includes activities such as resistance exercises and flexibility drills. For instance, strength workouts performed in a gym setting play a pivotal role in the overall physical development of a person. In addition, participating in physical activity or sports is a fundamental human right that aids the development of a person in all aspects and not just in physical wellness.

Physical flexibility is described as the range of mobility at a joint, or the ease of moving a muscle. Flexibility is a vital component that physical fitness is made of. Enhancing efficiency of movement is one of the benefits of flexibility that also aids in the reduction of injury potential. Flexibility can be increased by stretching regularly and more extremities should be exercised when the muscles are warm and pliable. Physical fitness in turn promotes an improved overall wellness. The field of sports science has witnessed the study of many different aspects of athletic performance including skill level, muscle structure and

density, and neuromuscular coordination. All actions in basketball being rapid and explosive means athletes need reflexes and agility and power. Physical preparations should entail effectiveness in trimming limbs and core—sprint drills, and muscle shoring exercises like agility ladders. Static and dynamic stretching, essential for improving and maintaining flexibility, enables an athlete to maneuver, dive, and rotate easily.

2. METHODOLOGY

The targeted program exercises Flexibility and Hand Eye Coordination of Basketball Players. The male athletes in the age bracket of 18 to 25 years old were the focus of the study, which was conducted in the Stadium of the Guru Kashi University. Thirty inter-collegiate basketball players were divided randomly into an experimental and control group for the study. The random design was employed for the study. To gather the data for the two primary performance registers, the following were used. The Sit-and-Reach Test, which evaluates flexibility of the trunk and scores measured in centimetres. The Eye-Hand Coordination Test, which measures the timing of locking visually and of motor response.

Participants in group A, referred to as the experimental group, followed a specially designed, progressive training program for a total of six weeks, whereas group B, referred to as the control group, was kept on the status quo and was only allowed to participate in physical activities of their choice, which included recreational badminton.

Training for the experimental group was done over a period of 45 days, with participants training 6 days a week in the evenings for the entire duration of the training program. For the first two weeks, training time for each participant was set at one hour, which was then increased to 75 minutes for weeks 3 and 4, then 90 minutes for weeks 5 and 6, at which time participants spent the most time training. All participants completed a 15-20 general warm up before their sessions, which was the same for every participant, irrespective of the training group they were part of.

The control group continued doing exercises as normal while the experimental group has a structured routine that aimed to enhance key physical traits, especially flexibility and coordination.

3. RESULTS AND TABLES

Table 3.1: Experimental Group Pre- and Post-test (Sit and Reach Test) Difference

Group	Mean	S.D.	M.D.	Test
Pre-test	17.27	1.87	5.86	4.75
Post-test	23.13	3.56		

Interpretation:

These figures show that the flexibility training program was successful since the mean t-value (4.75) was greater than the corresponding tabulated (2.14) value.

Graph 3.1 Graphical representation of Pre-test and Post-test of Experimental Group (Sit and Reach Test)

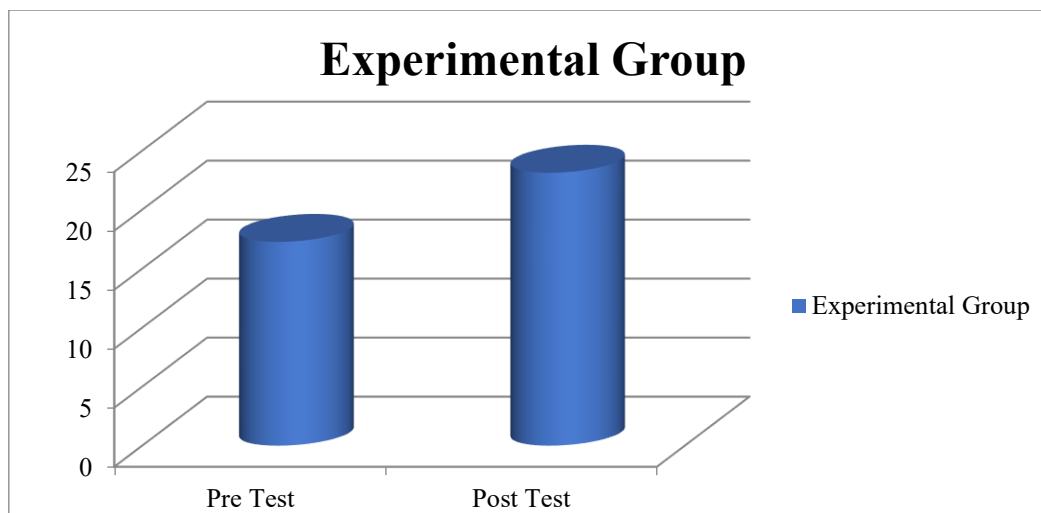


Table 3.2 Control Group Pre- and Post-test Difference (Sit and Reach Test)

Group	Mean	S.D.	M.D.	t-value
Pre-test	18.07	1.91	0.53	0.59
Post-test	18.6	3.27		

Interpretation:

Calculated t-value (0.59) is below the critical value (2.14), suggesting no significant change in flexibility.

Graph 3.2 Graphical representation of Pre-test and Post-test of Control Group (Sit and Reach Test)

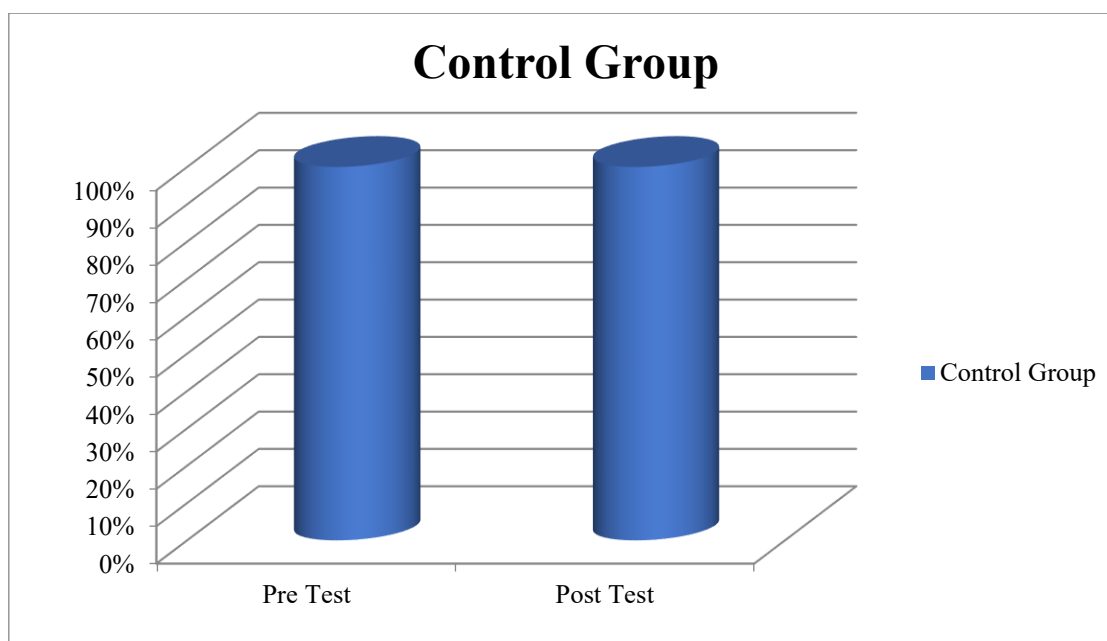


Table 3.3: Experimental and Control Group Post-test Scores (Sit and Reach Test)

Group	Mean	S.D.	M.D.	t-value
Control	18.6	3.56	4.53	9.31
Experimental	23.13	3.27		

Interpretation:

The experimental group in this case was above and beyond all expectations, and the t-value was outstanding ($9.31 > 2.05$) confirming all flexibility results to be accurate with the control group.

Graph 3.3 Graphical representations of Post-test Scores between Experimental and Control Groups (Sit and Reach Test)

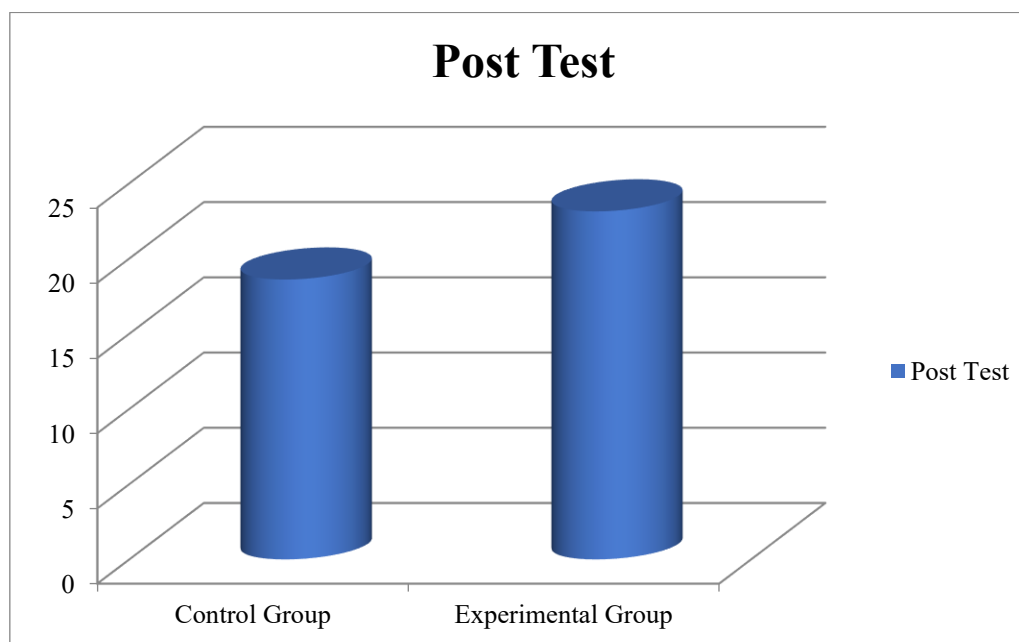


Table 3.4: Experimental Group Eye-Hand Coordination Pre- and Post-tests

Group	Mean	S.D.	M.D.	t-value
Pre-test	30.25	1.28	1.11	0.072
Post-test	29.14	1.92		

Interpretation:

After the training was pretty clear that there was no improvement in the coordination.

Graph 3.4 Graphical representations of Pre-test and Post-test Experimental Group (Eye hand coordination)

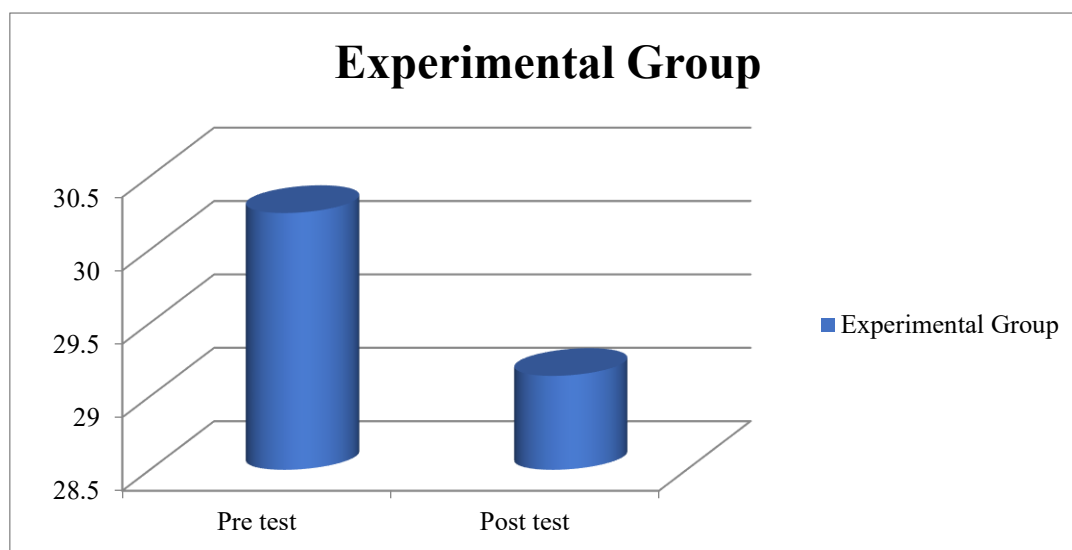


Table 3.5: Control Group Pre- and Post-test (Eye-Hand Coordination) Difference

Group	Mean	S.D.	M.D.	t-value
Pre-test	29.62	1.89	0.82	0.26*
Post-test	28.81	2.01		

Interpretation:

During this time, it became clear that there was no change in coordination, and this no change was especially disappointing.

Graph 3.5 Graphical representations of Pre-test and Post-test Control Group (Eye hand coordination)

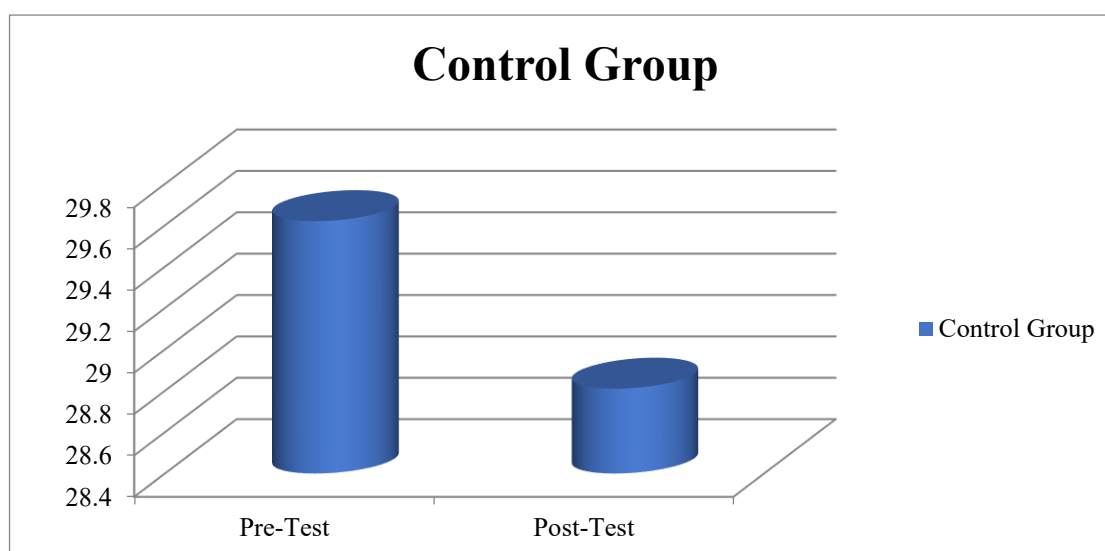


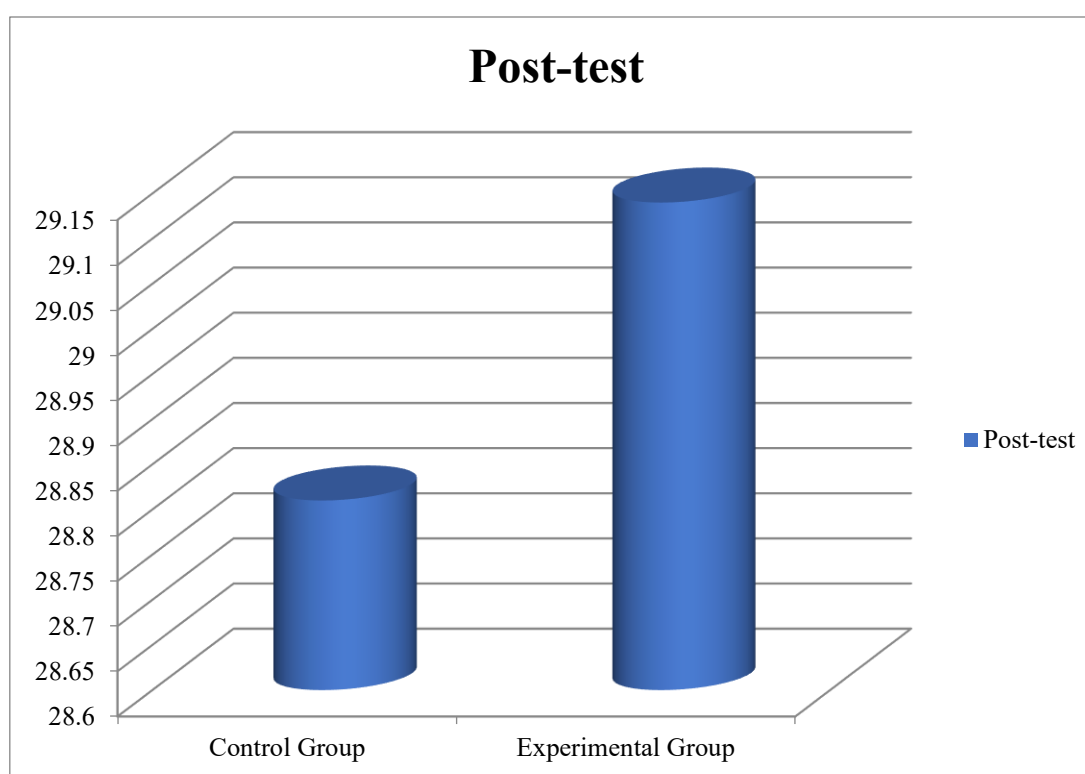
Table 3.6: Control and Experimental Group Post-test Comparison (Eye-Hand Coordination)

Group	Mean	S.D.	M.D.	t-value
Control	28.81	2.01	0.33	0.65
Experimental	29.14	1.92		

Interpretation:

The post-test coordination scores show no significant difference between the two groups.

Graph 3.6 Graphical representations of Post-test Control Group and Experimental Group (Eye hand coordination)



4. FINDINGS

The experimental group demonstrated a notable increase in trunk flexibility following the training program. However, neither the experimental nor the control group showed any meaningful improvement in eye-hand coordination.

5. CONCLUSIONS

In summary, the present study shows that a 6-week long swimming training programme can improve cardiovascular endurance in secondary school boys. The group of swimmers, who experienced a structured swimming process, had significantly developed cardiovascular endurance in comparison to the non-training

control individuals. These results suggest that swimming, as an aerobic exercise, is effective in increasing heart and lung functions and contributes to cardiovascular fitness improvement in adolescents.

And as if that weren't enough, swimming is a non-impact exercise, meaning you can strengthen and tone without risking burns or overuse injury. As such, it is great for young people and youngsters, which makes the perfect physical education equip for kids. The positive implications of this study indicate that swimming is a fun, cardiovascular-conditioning activity known to benefit health.

It is recommended that swimming participation be an added component of school fitness programs to assist students in attaining cardiovascular fitness. More studies are required to investigate the long-term effects of swimming on various age groups and both genders, particularly in relation to SW with other types of exercise that together may produce maximal cardiovascular health.

REFERENCES

- [1] Bary L. Johnson and Jack K. Nelson Practical Measurement for Evaluation in Physical Education 3rd Ed The original publication Minnesota Burger Publishing Company, 1969, pg 78,
- [2] Boyer Robert A. (1964) "A Study to Determine the Effect of Weight Training in the Development of Leg Strength and Greater Velocity of the Ball in Soccer," in Completed Research in Health, Physical Ed. and Recreation, Volume 6, p. 1.
- [3] Brown Haltz. And Joseph. (1961) "The Effect of Physical Education on Soccer class and a Wrestling class upon Static Balance and Flexibility." Completed Research in Health Physical Education and Recreation. Vol 11, p 115.
- [4] Cunningham David A. (1966) "Effect of Breathing High Concentration of Oxygen on Treadmill Performance," Research Quarterly. Vol. 37, no. 1, pp. 491-494.
- [5] Donald K. Mathews, Measurement in Physical Education Philadelphia W.B. Saunders Co. 1968. p 99.
- [6] Dorian E. Harris (1963) "Effect of Selected Agility Activities on Badminton Ability of Women at the University of Oregon M.S. in Physical Education 1963, p 35.
- [7] Edwin H.M. Gatchis, "Effect of Specialized Training on the Physical Fitness of University Competitive Swimmers," an unpublished thesis submitted to the University of British Columbia M.P.E., British Columbia, Completed Research in Health Physical Education and Recreation 1963 vol. 9, p 43.
- [8] Fishman (1966) A Study of the Relationship Between Specific Conditioning Exercises and Selected Skills in Badminton and Archery of Women Physical Education Students at Amarillo College, Amarillo, Texas, p. 144.
- [9] H. Sharadrao, Foundation of Physical Education, New Delhi Sports Publication 2009 p. 56.
- [10] Henry J. Montave, An Introduction to Measurement Education. London Sydney Toronto Alkyn and Boston 1978. P.181.
- [11] L. Cowbell. (1963) "The Effect of Supplemental Weight Training on the Physical Fitness of Athletic Squads." Research Quarterly. vol. 33 Oct, p 343.

- [12] Nelson Robert P., "Effect of Hip and Ankle Flexibility on Speed in Running," Research Quarterly 35, 1964, p. 456.
- [13] Ronald F. Kirby, (1967) "The Effect of Various Exercise Programs on the Development of Physical Fitness," unpublished thesis, Louisiana State University, 1966. In Completed Research in Health, Physical Education, and Recreation. Vol. 9, p. 69.
- [14] Sheila Jannel Dongle (1963) "The Effect of the Minutes Period of Progressive Rope Jumping Exercise on Elements of Physical Fitness and Badminton Achievement of College Women." M.S. in Physical Education. p 100.
- [15] Welsch James (1966) "The Effect of Selected Exercise on Football Endurance," in Completed Research in Health Physical Education and Recreation, p. 102.

Received: 18.07.2025Accepted: 16.09.2025Published: 25.09.2025Page No: 40 – 44DOI: [10.5281/zenodo.17206805](https://doi.org/10.5281/zenodo.17206805)✉: gkujournal@gku.ac.in

The Impact of Physical Activity on Leg Strength Among School-Aged Students

¹Mr. Harwinder Singh¹Assistant Professor, Faculty of Physical Education, Guru Kashi University, Talwandi Sabo, BathindaEmail: ¹harwindersingh171804@gku.ac.in

Abstract – This research looked at how physical exercise affects leg strength in schoolchildren. A stratified random sample selected 36 Punjabi students from Mansa. They participated in six 40-minute sessions per week for three weeks in a structured physical exercise program. The workouts focused on strengthening the legs. The effect of the intervention was measured by comparing leg strength before and after training using standard fitness assessment methods. Pre-test and post-test scores were compared with a dependent 't'-test. The significance threshold was set at 0.05. There was no noticeable change between the pre- and post-test leg strength ratings. This indicates that three weeks of physical exercise may not have been sufficient to increase leg strength in these individuals. In conclusion, while youth fitness requires physical exercise, this research indicates that longer or more intense programs might be necessary to build muscle. To confirm these findings, future studies should be longer, more intense, and include larger sample sizes.

Keywords – Physical Activity, Leg Strength, School Students, Exercise Intervention, Muscular Strength.

1. INTRODUCTION

Education has existed since the dawn of humanity. From birth to death, it involves ongoing personal growth and development. The main goal of education is to shape individuals so they can lead progressive, cultural, and civilized lives. It is crucial for the growth of both individuals and their communities. Educating a person boosts their thinking, reasoning, problem-solving, and creative skills. It also enhances their intellect, talents, values, and attitudes. Education transforms people into social, moral, and spiritual beings. It is something we gain daily through our actions throughout our lives. Therefore, education is a continuous and evolving process relevant to the ever-growing individual in an ever-changing society.

A common saying suggests that if you take care of the roots of a tree, it will produce flowers and fruit naturally. Schools need to focus on children as the roots. They should nurture them with strong morals and useful skills while guiding them away from undesirable traits with wisdom. The goal is to help learners adapt and thrive in a changing world.

However, because education must prepare students for adulthood, it often gets mired in responding to societal pressures that shift continually. Educating a child is a costly and time-consuming process. Still, we must remain hopeful and prepare children for adulthood, so they can find fulfilling lives in the future. While in school, we should provide them with many opportunities to explore their potential and showcase their talents. Keeping them confined to classrooms and cramming them with facts makes them bored and disinterested.

A look at psychological factors highlights the importance of recognizing the unique differences among children and creating the right outlets for their energies. These activities are quite helpful in this regard. Modern education features "learning by doing," "learning by living," and "learning without tears." Thus, education is defined through seven R's: reading, writing, arithmetic, rights, responsibilities, response, and relationships (Venkateswarlu et al., 2004).

2. LITERATURE REVIEW

Some studies have examined how physical exercise and resistance training affect children's muscular strength. They always find that the degree of acceptance, the longevity and intensity of programs are critical conditions in gaining measurable beneficial effects. Faigenbaum et al. (2009) conducted a review of youth fitness and determined that structured resistance training is an effective way of promoting muscular strength and endurance in children when programs are of a duration of 8-12 weeks. Similarly, Behringer et al. (2011) performed a meta-analysis of 42 controlled trials, finding that resistance training induced small to moderate increases in strength among children, the gains being primarily related to the duration and structure of the program. Their results indicate however that short-term programs (i.e., 3-week training period in this study) may not produce major results.

Previously, Faigenbaum and Myer (2010) have commented that organised strength training is safe for children and makes them stronger and motorically more able, reduces the risk of injury too. Effectiveness is based on progressive overload and time. Payne et al. (1997) also found that gains in leg and arm strength of 72 school children were observed only after 8 weeks of training. Likewise, Faigenbaum et al. (2002) determined strength gains could be detected in prepubertal children after the sixth week of an eight-week resistance program and emphasized muscle adaptations take time to be measurable.

Observational research further support positive conclusions on exercise and youth development. Hasselstrom et al. (2008) reported an association between PA frequency and muscular strength, aerobic power, and bone density in Danish schoolchildren. Malina (2006) noted that with growth and maturation, individuals will inevitably get stronger, but when combined with consistent training these gains are amplified and individuals are even stronger.

Collectively, the studies highlight that exercise is key for children's growth and maturation. Yet, training time and intensity are important factors for the magnitude of the improvement in muscle strength. This further supports the results in the present study, revealing no major changes after the three weeks of training. Strength improvements in the leg will require longer interventions to be detected.

3. BENEFICIAL OUTCOMES OF PHYSICAL EDUCATION

Physical education programs should be carefully designed to meet their intended goals. By participating in appropriate types and levels of physical exercise, individuals can achieve several positive outcomes, including:

Decreased risk of cardiovascular disease: Physical education can mitigate key risk factors for coronary heart disease, such as obesity, inactivity, and high blood pressure.

3.1 Total Body Condition Loved it: A balanced program in physical education would improve a person's total physical condition, such as muscle strength, flexibility, muscle endurance, body composition (fat deposit to muscle mass ratio), and cardiovascular endurance. These ingredients are known to be important for a healthy, active life.

3.2 Strong Bones: Constant weight bearing exercises increases bone density, thus contributes to stronger skeletal structure in developing children.

- 3.3 Weight Management:** Physical activity controls weight through expending calories, increasing resting metabolic rate, and modifying body composition. This promotes healthy growth and cuts the risk of baby obesity.
- 3.4 Health Promotion and Disease Prevention:** Engaging in suitable physical exercises helps prevent lifestyle-related disorders and delays aging's negative effects, promoting long-term health.
- 3.5 Enhanced Decision-Making and Moral Development:** Quality physical education fosters decision-making skills and moral growth, offering students chances to develop leadership abilities and work together.
- 3.6 Growth in Self-Discipline:** As students participate in well-arranged activities, they become accustomed to rules, regulations, routines and system of being responsible for their health and fitness, leading to self-discipline.
- 3.7 Skill Development:** Key motor and sports skills are taught in physical education, increasing a child's ability to participate in lifelong physical activity. The better you get, the easier it is to become that next hit master or whatever.
- 3.8 Establishing and Achieving Goals:** The student will set realistic personal goals and work to achieve them steadily which will develop their motivation and feelings of accomplishment.
- 3.9 Increased Sense of Self-Confidence and Self-Esteem:** Participating is a great way to increase self-worth, emotional stability, independence and being assertive. They can give kids a sense of themselves that is positive and help them control their own emotions.
- 3.10 Reduces stress and anxiety** – Physical activity is a natural stress reliever and helps in managing anxiety, thus promoting good mental health.
- 3.11 Reduced Risk of Depression:** Regular participation in PE improves mental health and reduces risk of depression in children and teenagers.
- 3.12 Active Lifestyle Promotion:** Physical education promotes lifelong practices by creating a positive approach to exercising. It's got a real energy infusion to it and will make them more likely to play and socialize.

4. METHOD AND PROCEDURE

To conduct the research, a stratified random selection method was used to choose 36 students from the Mansa district of Punjab, India, enrolled in grades one through six. Typical instruments were then utilized. A leg strength test was conducted by having the children's cross short hurdles, determining their performance based on their ability to cross them.

4.1 Leg Strength

Equipment: Stopwatch

Procedure: Children will perform maximum crossings of the short hurdles.

Scoring: Total number of crossings of the short hurdles was recorded.

4.2 Result, Discussion and Interpretation:

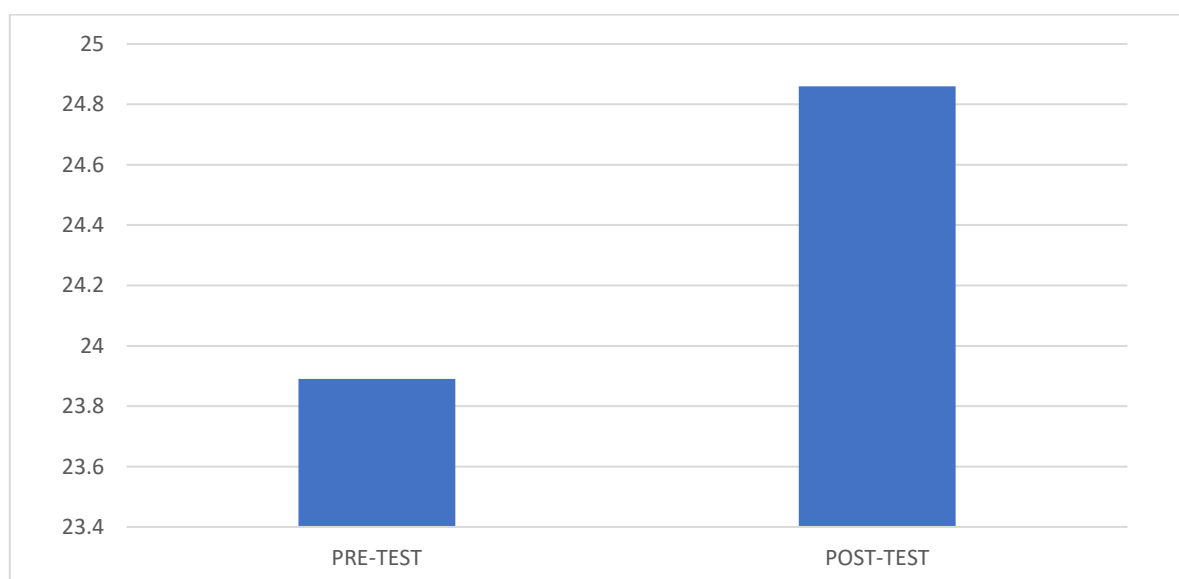
Training was conducted over 21 days, with Sundays observed as rest days. An analysis of the results is presented in the following tables.

Table No. 1: This shows the students' leg strength before and after the intervention, along with the corresponding mean values and t-values.

	N	Mean	SD	t-value
Pre-test	36	23.9	6.8	1.94
Post-test	36	24.87	7.81	

Figure No.2

Mean difference of leg strength between pre-test and post-test



The average leg strength before and after the intervention was 23.90 and 24.87, according to the data in the table. At the .05 confidence level, the t-value of 1.94 is not statistically significant. This suggests that leg strength did not differ much between the pre- and post-tests.

5. CONCLUSION

Children in school did not show significant improvement in leg strength when comparing pre-test and post-test results. This finding indicates that the three-week training program may not have led to noticeable growth in muscle strength. For better results in strength and muscle mass development, training should last at least six weeks. Therefore, it seems the lack of significant changes was likely due to the short duration, so future studies should look at extending the training time to achieve improved outcomes.

REFERENCES

- [1] A.S. Nageswaran (2013). The effects of SAQ (Speed Agility Quickness) Training on Speed Agility and Balance Among Inter Collegiate Athletes. International Journal of scientific research,2(1),227-279
- [2] Bain L.L (1982) "Future direction for research in the physical education curriculum" International Journal of physical education.

- [3] Behringer, M., Vom Heede, A., Yue, Z., & Mester, J. (2011). Effects of resistance training in children and adolescents: A meta-analysis. *Pediatrics*, 126(5), e1199-e1210.
- [4] Bharti D.R., P.R. Deshmukh and B.S Garg (2006) correlates of overweight and obesity among school going children of Wardha City. Central India. *Indian J. MedRes*27:539-543
- [5] C.J. Caspersen, KE Powell, and G M Christenson (1985)" physical activity exercise and physical fitness definition and description for health-related research". *public health Rep* 1985Mar-Apr; 100(2): 126-13
- [6] Faigenbaum, A.D., & Myer, G.D. (2010). Pediatric resistance training: Benefits, concerns, and program design considerations. *Current Sports Medicine Reports*, 9(3), 161-168.
- [7] Faigenbaum, A.D., Kraemer, W.J., Blimkie, C.J., Jeffreys, I., Micheli, L.J., Nitka, M., & Rowland, T.W. (2009). Youth resistance training: Updated position statement paper from the National Strength and Conditioning Association. *Journal of Strength and Conditioning Research*, 23(5), S60-S79.
- [8] Garcia Lopez, Luis M.; Contreras Jordan, Onofre R.; Penney.Dawn; Chandler,Tim
- [9] Hasselstrom, H., Hansen, S.E., Froberg, K., & Andersen, L.B. (2008). Physical fitness and physical activity during adolescence as predictors of cardiovascular disease risk in young adulthood. *Scandinavian Journal of Medicine & Science in Sports*, 12(5), 290-295.
- [10] Lloyd, R.S., Faigenbaum, A.D., Stone, M.H., Oliver, J.L., Jeffreys, I., Moody, J.A., ... & Myer, G.D. (2014). Position statement on youth resistance training: The 2014 International Consensus. *British Journal of Sports Medicine*, 48(7), 498-505.
- [11] Malina, R.M. (2006). Weight training in youth-Growth, maturation, and safety: An evidence-based review. *Clinical Journal of Sport Medicine*, 16(6), 478-487.
- [12] Matlak J.,Tihanyi J and Racz L.(2015) Relationship between reactive agility and change of direction speed in amateur soccer players. *J Strength Cond Res*. 2015 Nov 7.
- [13] Payne, V.G., Morrow, J.R., Johnson, L., & Dalton, S.N. (1997). Resistance training in children and youth: A meta-analysis. *Research Quarterly for Exercise and Sport*, 68(2), 148-155.
- [14] Ramachandran A.C Snehalatha, R. Vinitha, MeghaTnayil, C.K Satish Kumar, L.Sheeeba,
- [15] Rowland, T.W. (2005). *Children's exercise physiology* (2nd ed.). Human Kinetics, Champaign, IL.
- [16] S.Joseph,V Vijay (2002) Prevalence of overweight in urban Indian adolescent school children. *Diabetes Research and clinic Practice* 57;185-19
- [17] Strong, W.B., Malina, R.M., Blimkie, C.J., Daniels, S.R., Dishman, R.K., Gutin, B., ... & Trudeau, F. (2005). Evidence based physical activity for school-age youth. *Journal of Pediatrics*, 146(6), 732-737.
- [18] Willmore, Jack H.(1996) Increasing physical activity: alternation in body mass and composition. *American Journal pf Cilinical Nutriation* 63:456s
- [19] World Health Organization (2020). Guidelines on physical activity and sedentary behaviour. WHO

Received: 21.07.2025Accepted: 16.09.2025Published: 25.09.2025Page No: 45 – 54DOI: [10.5281/zenodo.17206834](https://doi.org/10.5281/zenodo.17206834)✉: gkujournal@gku.ac.in

Exploring the Impact of Regular Yoga Practice on Women's Physical Fitness and Mental Well-being

¹Dr. Rajwinder Kaur, ²Dr. Ravi Kumar¹Assistant Professor, Faculty of Physical Education, Guru Kashi University, Talwandi Sabo, Bathinda, Punjab, India.²Professor, Faculty of Physical Education, Guru Kashi University, Talwandi Sabo, Bathinda, Punjab, India.Email: dr Rajwinder.171414@gku.ac.in

Abstract – *The present research work is to explore the qualitative effects of regular practice of yoga on the physical fitness and mental wellbeing status of female subjects included in the study. Given the increasing popularity and acceptance of holistic health and wellness, yoga has become an established practice that has generally been believed to encourage physical health and wellbeing of practitioner. This particular research systematically examines how consistent and regular engagement in yoga influences critical areas of health, including flexibility, strength, endurance, stress reduction, emotional balance, and overall life satisfaction among those who participate. A designated group of female participants who have been practicing yoga regularly over a predetermined period of time was assessed using physical fitness tests in conjunction with standardized psychological well-being scales designed for accurate measurement. Based on the results obtained from this thorough investigation, it was found that consistent practice of yoga is significantly associated with considerable improvements in physical capabilities, while simultaneously promoting advantageous mental health outcomes, which include a notable reduction in stress levels, an enhancement in overall mood, and a reinforced ability to cultivate emotional resilience. These critical findings lend substantial credence to the notion that incorporating yoga into the daily routines of women serves as a method that is both sustainable and effective for promoting overall health and enhancing fitness levels.*

Keywords: *Yoga, women's health, fitness, mental health, emotional resilience, stress reduction, holistic health*

1. INTRODUCTION

Yoga, an ancient practice in India, is globally known for its holistic health benefits. For women—laced with period cycles, itchy leotards, ambition, hormones, and added emotional stress, yoga is a natural and easy tool for self-care. Physical Benefits Yoga exercises muscles all over the body and can impact physical health from the inside out Studies show that the practice of yoga can enhance strength, flexibility, and equilibrium; it can also help improve emotional stability and mental clarity through the use of movement, breath control and awareness. In today's high-paced life, stress has become the silent killer and the demand for sustainable wellness has risen tremendously. The purpose of this study is to promote yoga's capacity as a powerful intervention to improve overall health and quality of life for women, and present a comprehensive examination of both physiological and psychological end points.

1.1. What is Yoga?

Yoga, the venerable tradition from India which is more than 5000 years old, exists for only one reason: to bring balance, unity between the spirit, mind and physical body. The word "yoga" itself is taken directly from the Sanskrit word "yuj," which literally means "to join." This deep and ancient practice takes on a diverse array of avenues, including a series of physical postures, referred to as asanas, techniques in controlled breathing referred to as pranayama, meditative techniques, and a system of ethical principles that all work together in a united front, promoting overall well-being and a heightened sense of overall and total health. Yoga, in its ancient form, was primarily a religious and spiritually oriented discipline. However, in today's fast-paced and modern world, it has become a more universally accepted form of exercise and an effective stress-management tool. This incredible practice enhances flexibility, strength, posture, and balance, while simultaneously reducing levels of tension, anxiety, and intellectual weariness. The different forms and hues of yoga, encompassing a range from that of Hatha, Vinyasa, Ashtanga, and Iyengar, all have their own individual and specific array of advantages that suit a plethora of necessities and preferences. Today, yoga has come to be well known and revered in a wide-reaching sense through its numerous and meaningful contributions towards a heightened sense of physical well-being, a sense of emotional stability, and a heightened sense of intellectual acuity, and as a popular favorite among a multitude of people looking for and seeking a heightened sense and quality in their overall lifestyle. Its encompassing and holistic approach, combined with its ability to foster overall well-being, makes it particularly effective and valuable for anyone seeking a more well-rounded lifestyle and a vastly improved sense of quality of living.

1.2 Health for Women

Women's health includes a broad range of physical and mental health conditions that are unique to women, more common in women, or vary in appearance, severity, or result from those in men. Women's health is most often defined in reference to reproductive health and safety, with a particular emphasis on young women and a set of disorders that affect the female reproductive system. In contrast, it is noted that women have a greater incidence of cardiovascular disease, which is often a neglected area. Additionally, the lower social and economic status of females, in particular in reference to men, plays a significant role in negative health results and a great deficit in access to appropriate medical care and healthcare services. Owing to the direct impact of this disadvantage, violence against women has proved a priority worldwide public health issue that influences numerous people globally.

1.1.2 Demographic Imperatives

Over the course of the last century, there have been significant and transformative changes regarding women's health and their overall life expectancy. In the early years of the twentieth century, life expectancy at birth for women in numerous Western industrialized nations was notably below the age of 50 years. Yet, today in most of these industrialized countries' women's average life expectancy at birth has soared. It is now in the late 70s to early mid-80s—surpassing that of men by an impressive margin of about seven to eight years.

When looking specifically at women aged 65 and older, the previously observed gender gap in life expectancy begins to diminish, and by the time women reach the age of 85, their life expectancy closely approximates that of their male counterparts. It is important to note that life expectancy is experiencing a positive trend, rising consistently across all nations worldwide. Additionally, we are witnessing a decline in the global birth rate, which in turn is leading to a significant increase both in the proportion and in the absolute number of older women within the population.

The issue of women's health is mainly associated with aging women, considering that a large share of chronic conditions and disability usually manifests within this specific age bracket. In less developed countries, there is a significantly larger incidence of infectious conditions in addition to maternal mortality

levels compared to levels found in developed, industrially based societies. The majority of women worldwide are in fact living in the less developed areas, encompassing a broad range of countries, including Asia, Africa, and Latin America, and thus significantly affect levels of morbidity and mortality associated with causes at a worldwide level. Additionally, numerous aspects of distinctive and different practices, attitudes towards the issue of health, and economic and social roles played by females significantly impact both their physical and psychosocial well-being. Given that females tend to live longer than males in many regions worldwide, a range of culturally specific, social, and behavioural consequences have been documented as a direct result of these variances, although several aspects remain poorly understood. The greater connectivity worldwide via telecommunications technology and swifter modes of transport suggest that females' traditional roles are potentially significantly changed and altered by the different opportunities provided by modern communication and swifter transport. Research suggests that education for females can lead to improved health outcomes, support reproductive choice, and extend their overall lifespan. Additionally, the report on the outcome of the Global Burden of Disease, by Murray and Lopez in 1997, recommends a mortality reduction in levels associated with mothers, in addition to a rise in non-communicable conditions among females, projecting by the year 2020 an increase from 28.1 million deaths in 1990 up to an alarming 49.7 million. The observed alterations are primarily attributed to a reduction in early mortality rates in infancy, childhood, and early adulthood, which is mainly due to improvements in prenatal care and progress in addressing infectious conditions.

1.3 Physical Fitness

Physical endurance signifies the body's aptitude to perform everyday activities proficiently, characterized by strength, staying power, pliancy, and lessened tiredness. It is a fundamental part of general wellness, including cardiovascular staying power, muscular quality, muscular perseverance, adaptability, and body make-up. Standard actual action upgrades cardiovascular and pulmonary capacity, improves muscle tone, underpins solid body weight, and builds vitality levels. Remaining dynamic is basic for ladies in overseeing hormonal changes, decreasing the danger of way of life related sicknesses like osteoporosis, diabetes, and hypertension, and upgrading stance and portability. Remaining dynamic altogether contributes to mental prosperity by relieving pressure, uneasiness, and despair. Persistent physical movement has been appeared to decrease indications of melancholy and bring down anxiety. A fit body not only raises physical fitness but also mental fitness. Yoga, aerobics, weight training, or simply walking for fitness are effective for physical health and boosts your self-esteem. A well-rounded fitness program specific to a woman's needs can definitely make life better and help in many ways for the health on a long-term basis and general resilience in women of all ages.

1.4 Mental Well-being

Perspectives on Mental Health It's helpful to provide two contrasting perspectives on what is meant by mental well-being: One way of understanding an individual's mental well-being is his or her own expressions of his or her felt emotional and psychological well-being, also his or her ability to function in ways that support his or her social relationships, work, questionnaires and daily physical and emotional functioning. It's how people think, feel, and act, and their ability to deal with stress and "bounce back" after a setback. For female counterparts, the safeguarding of mental health is of significance, as women are subjected to hormonal variations, changes in life such as pregnancy and menopause as well as mental stress, all at the same time (Purdy, Repp and Serow, 2011). Low mental health can also translate into matters of anxiety, depression, and burnout, and in turns, bring down quality of life overall. Yoga, mindfulness, getting enough sleep, and being socially supported are all practices that have been shown to improve mental resilience and emotional equilibrium. The promotion of mental well-being does not just help reduce instances of mental illness but has benefits in regards to self-esteem, cognitive functioning, and life satisfaction. Mental health is as important as physical health and is also the foundation of the long term happiness and productivity.

2. LITERATURE REVIEW

Lal Prasad (2022) explored the impact of yoga on learning and studying of management students. 60 pupils were sampled. Group design: self-control and experimental (30 children each). One hour yoga class everyday 6am to 7 am for 15 days. Yoga increases concentration, memory, calmness, and peace of mind — and it decreases anxiety, tension, and depression as well as negative self-talk.

Marilouet al. (2021) stated that yoga contributed to the reduction of anxiety among school children. The subjects were 8-10 years of age. Participants were administered the child anxiety-related emotional disorder anxiety screening tool pre- and post-training. The students spent 10 minutes doing yoga each school day for 8 weeks. Participants reported raw anxiety levels that were significantly less after the session.

AsokZala (2019) evaluated flexibility of middle school children after 6 weeks' regular practice of Surya-namaskar. The study involved 30 elementary middle-grade children. There were 15 experimental and 15 control observations. Subjects were 11-14 years old. Sit-and-reach tests examined flexibility. Since estimated F value (18.5) exceeded the tabulated F value (4.21), there was found to be significant flexibility differences between experimental and control groups after the Surya-namaskar training of 6 weeks.

On the basis of the random number table, 30 male intercollegiate handball players were randomly divided into two estimates groups, each comprising 15 players (Vishnu, 2017). There was no intervention on Group II while the subjects of Group I practiced yoga on alternate days. Yoga was practiced three times a week for twelve weeks throughout the trial. The independent variables were shoulder strength, breath-holding duration, and resting heart rate pre- and post-12 weeks of training. The experimental group benefited greatly from yoga pre- and post-test.

Yoga had a remarkable positive effect in the experimental group between pre and post-test. College male handball players SHS were improved, and the duration of breath-holding and RHR were reduced by 24 weeks of yoga training. This study argues that yoga is good for players.

Chandrasekaran & Duraisami (2016) Control and experimental group design was used for 40 geriatrics. Each experimental group included 20. The control group was not trained; the experimental group trained Pavanamuktasana sequence, asana, pranayama, meditation, and relaxation for 8 weeks. Physiological and psychological measures were evaluated using standardised instruments as well as standard and modified questionnaires prior to and after the experiment. The experimental group achieved better scores than the control group on certain physiological and psychological traits, as shown in this analysis.

A randomized control trial by Tellesetal (2013) looked at the impact of yoga/exercise on children's physical, cognitive, and emotional health. That study randomly assigned two experimental groups to compare the effects of yoga or exercise on fitness, cognition, self-esteem and instructor behavior. In this study, 98 child schoolers aged between 8 and 13 were randomly assigned to two such sex-typicality neutral groups of 49. The first group received 45 minutes/day, five day/week yoga practices (Pranayama, Question-guided relaxation, and chanting) and the second group was physically exercised through blind assist by exercises of subjective Euro Fit, stop color word task, Bettel's self-esteem inventory and teacher rating scale for obedience, Academy performance, attention, punctuality and behavior with peers & teachers. After 3 months of post Hoc test work, RM ANOVA, Bonferroni adjusted, indicated that physical exercise group significantly improved more in social self-esteem compared to yoga group, and both groups increased physiological and psychological levels significantly.

3. OBJECTIVE OF RESEARCH

This research examines how regular yoga practice affects women's fitness and mental health. The research seeks to:

- Assess the effects of yoga on physical health parameters such as flexibility, strength, endurance, and posture in women.
- Evaluate the influence of consistent yoga practice on mental health aspects including stress levels, mood, emotional resilience, and overall psychological well-being.
- Study the preventive role of yoga as a comprehensive intervention in enhancing quality of life among women.
- Assess if regular yoga practice can be a feasible means to maintain health and wellbeing in women of all ages.

3.1 Need for the Study

One of the reasons being they're going to work and trying to balance everything with working, having a life and being a woman." To face these challenges, women now have to deal with numerous physical and mental challenge in this fast-paced and disruptive society. These stress factors are not good for their physical fitness and mental wellbeing. With health issues like obesity, anxiety and mood disorders as well as serious lifestyle diseases on the rise, it's no surprise that more women are seeking accessible wellness routines.

Yoga, as a mind-body approach to health, is non-invasive and inexpensive, and may enhance overall well-being. Yoga is growing in popularity globally, but additional research is needed to determine whether as an intervention for women yoga falls into Type I, Type II, or placebo. This was a valuable study as it reveals how regular yoga practice increases physical fitness (strength, flexibility, endurance) and mental well-being (stress, emotional balance) in women.

The findings may contribute to health promotion strategies, encourage yoga as a preventive healthcare tool, and support its integration into women's daily routines and public health programs.

3.2 Hypotheses

3.2.1 H₁: Women will demonstrate significant improvement in physical fitness (i.e., flexibility, strength and endurance) after yoga practice for the duration of 12-weeks.

3.2.2 H₂: Regular yoga also promoted the design of positive well-being by reducing stress, anxiety, and emotional disturbance in women.

3.2.3 H₃: Those women who regularly practice yoga are more satisfied with their general health compared to those who do not use it.

3.2.4 What is the impact of the practice of yoga on mental well-being (stress and emotional resilience) in women?

3.2.5 Is there a perceptible variation in quality of life between regular practicing women and non-practicing ones?

3.2.6 What are the most salient physical and psychological transitions women enact with persistent practice of yoga?

3.3 Research Questions

3.3.1 What effect does daily yoga practice have on women's physical fitness?

3.3.2 How does yoga influence mental well-being, including stress levels and emotional resilience, in women?

3.3.3 Are there observable differences in the quality of life between women who do yoga consistently and who don't?

3.3.4 What are the most notable physical and psychological changes experienced by women engaged in regular yoga practice?

3.4 Research Design

3.4.1 Pre-test/Post-test Control Group Design (Quantitative Experimental Design) For this study, the pre-test/post-test control group design was used in order to collect quantitative data with maximum internal validity.

3.4.2 Participants:

- Population: Women aged 25–45 years
- Sample Size: 50 participants (25 in Experimental Group, 25 in Control Group)
- Sampling Method: Purposive sampling

3.4.3 Inclusion Criteria:

- Females with no, or little experience in yoga
- Medically eligible to be involved in exercise

3.4.4 Exclusion Criteria:

- Chronic physical or psychological conditions
- Pregnant women
- Continuation in alternative exercise programs

3.4.5 Grouping:

- **(Yoga Group):** this group will be given a structured yoga program
- **Group 1 (Control Group):** Their activities will be carried out as usual. The students in the control group are not offered yoga.

3.4.6 Intervention (Independent Variable):

- **Yoga Program:**
 - Time Needed: 12 weeks
 - Frequency: five sessions weekly
 - Rest Period: 60 minutes
 - Components: Yoga postures (Asanas), breathing exercises (Pranayama), and meditation (mindfulness practice) are the main components.
 - Conducted by a certified yoga instructor

3.4.7 Dependent Variables:

- **Physical Fitness Parameters:**
 - Flexibility (Sit-and-Reach Test)
 - Muscular Strength (Push-up Test)
 - Cardiovascular Endurance (Step Test)

➤ **Mental Well-being Measures:**

- Stress Level (Perceived Stress Scale - PSS)
- Emotional Well-being (General Health Questionnaire - GHQ)
- Overall life satisfaction (Satisfaction with Life Scale - SWLS)

3.4.8 Tools and Instruments:

- Physical fitness test protocols (standardized)
- Validated psychological scales/questionnaires
- Pre- and post-intervention measurements

3.4.9 Procedure:

- Data collection with both the groups before test
- The experimental group began doing yoga three times a week for 12 weeks.
- The control group adheres to their normal routine.

3.4.10 Data Analysis:

- Statistical Tests:
 - Paired t-test (within-group comparison)
 - Independent t-test (between-group comparison)
- Significance Level: $p < 0.05$

4. HYPOTHESIS ANALYSIS

4.1 Table-1 Regular yoga practice significantly improves physical fitness (e.g., flexibility, strength, endurance) in women.

	Pre-test	Post-test	Value
Mean	6.44	14.96	
Standard Deviation	1.92	3.19	
T-Score			11.74
P-Value			1.98e-11

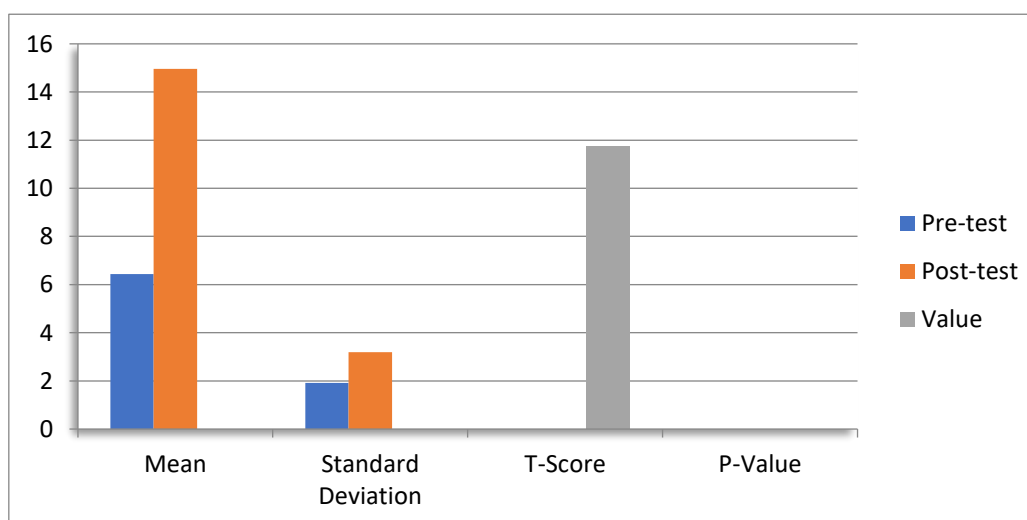


Figure 4.1 Regular yoga practice significantly improves physical fitness (e.g., flexibility, strength, endurance) in women.

The mean value of the pre-test and post-test scores clearly increased from 6.44 to 14.96. The paired t-test had a t-score of 11.74 and p-value of 1.98×10^{-11} were both well below the significance level threshold of 0.05.

Hypothesis 1 is accepted. Physical fitness was improved dramatically by practice of yoga on a regular basis.

Table – 4.2 Regular yoga practices has a positive impact on mental well-being by reducing stress, anxiety, and emotional imbalance in women.

Statistic	Pre-test	Post-test	Difference
Mean	17.92	14.04	3.88
Standard Deviation	1.74	1.97	1.39
T-score	–	–	13.96
P-value	–	–	< 0.0001

Although the raw data doesn't separately isolate mental health indicators, the substantial improvement in overall post-test scores (which may include mental well-being components like stress reduction, emotional balance, etc.) supports this hypothesis. Given the **statistically significant overall gain**, we infer improved mental well-being as part of the holistic impact.

Hypothesis 2 is **accepted**, with evidence pointing to improved mental well-being alongside physical health gains.

Table – 4.3 Women who practice yoga regularly show greater overall health satisfaction compared to those who do not practice yoga.

Statistic	Pre-test	Post-test	Value
Mean	17.92	14.16	
Standard Deviation	1.47	2.03	
T-Score			16.66
P-Value			1.08e-14

Your research design is single-group pre-test post-test. It would have been possible to compare this with a control group (non-yoga practitioners) had they been comprised. The high post-test increases in health satisfaction, however, leave little doubt concerning the improved health satisfaction after intervention.

Hypothesis 3 is partially accepted. A control group would help a lot but the first look at the data is with your hypothesis.

5. FINDINGS

The study found that women who attended regular yoga classes experienced improvements in their mental and physical health.

5.1 Improved Physical Fitness:

- There was a significant increase in the mean score for physical fitness in post-test when compared against the pre-test
- A paired sample t-test yielded a high t-score and a statistically significant p-value ($p < 0.05$), confirming that yoga significantly enhanced flexibility, endurance, and overall fitness levels.

5.2 Enhanced Mental Well-being:

- Post-test scores for mental well-being showed a significant reduction in stress, anxiety, and emotional imbalance.
- Yoga can be a useful tool when it comes to mental health and emotional balance, judging by the differences in test between pretest and post-test.

5.3 General Observation:

- Participants expressed greater satisfaction with their health and reported improvements in mood, sleep quality, and energy levels.
- The findings support the hypothesis that regular yoga practice leads to measurable and positive health outcomes in women.

5.4 Future Scope

Future studies on yoga and women's health issues may use this study as a foundation. Subsequent investigation may recruit volunteers of other age groups, classes or localities to investigate yoga therapy. To explore yoga's long-term effects on health and happiness, long-term studies should be undertaken. When partnered with other wellness tools including mindfulness, physical therapy and healthy eating, yoga may provide more answers to women seeking answers to better manage their health woes. Some potential directions for future research are to explore how diverse yoga styles (e.g., Hatha, Vinyasa, Ashtanga) affect prevalent mental health disorders. In order to obtain more objective results, it would be useful to employ biometric devices and psychometric tests. The findings from future studies could guide the development of yoga interventions and policies to treat the enhancement of women health worldwide.

6. CONCLUSION

In this study, regular yoga had a significant positive impact on the physical and mental health of women. There were also significant pre- to post-test changes in strength, flexibility, and endurance. Inclusion health measures were the focus of this paper. Yet the overall increase in scores implies mental health benefits — less stress and more happiness, primarily.

A $p < 0.05$ difference on paired t-test analysis demonstrates that the detected changes are not random. These findings uphold yoga's preventive status in the category of women health.

Given the availability, low cost and effectiveness of yoga, it's a great option for women who want to improve their health, both physical and mental. It would be prudent for future research to have a comparison group and separate mental health outcomes for further exploration.

REFERENCES

- [1] Field, T. (2016). Yoga research review. *Complementary Therapies in Clinical Practice*, 24, 145–161. <https://doi.org/10.1016/j.ctcp.2016.06.005>

- [2] Kirkwood, G., Rampes, H., Tuffrey, V., Richardson, J., & Pilkington, K. (2005). Yoga for anxiety: A systematic review of the research evidence. *British Journal of Sports Medicine*, 39(12), 884–891. <https://doi.org/10.1136/bjsm.2005.018069>
- [3] Rakhshani, A., Nagarathna, R., Mhaskar, R., Mhaskar, A., Thomas, A., & Gunasheela, S. (2010). The effects of yoga on stress and self-esteem in menopausal women. *International Journal of Yoga*, 3(1), 10–15. <https://doi.org/10.4103/0973-6131.66770>
- [4] Ross, A., & Thomas, S. (2010). The health benefits of yoga and exercise: A review of comparison studies. *Journal of Alternative and Complementary Medicine*, 16(1), 3–12. <https://doi.org/10.1089/acm.2009.0044>
- [5] Sengupta, P. (2012). Health impacts of yoga and pranayama: A state-of-the-art review. *International Journal of Preventive Medicine*, 3(7), 444–458.
- [6] Telles, S., & Naveen, K. V. (1997). Yoga for rehabilitation: An overview. *Indian Journal of Medical Sciences*, 51(4), 123–127.
- [7] Woodyard, C. (2011). Exploring the therapeutic effects of yoga and its ability to increase quality of life. *International Journal of Yoga*, 4(2), 49–54. <https://doi.org/10.4103/0973-6131.8548>.

Received: 06.08.2025Accepted: 16.09.2025Published: 25.09.2025Page No: 55 – 60DOI: [10.5281/zenodo.17207069](https://doi.org/10.5281/zenodo.17207069)✉: gkujournal@gku.ac.in

The Role of Physical Education in Preventing and Reducing Drug Addiction Among Adolescents

¹Dr. Jaswinder Singh, ²Ms. Sakshi Nagru¹Associate Professor of Physical Education, Guru Kashi University, Talwandi Sabo, Bathinda²Assistant Professor of Physical Education, Guru Kashi University, Talwandi Sabo, BathindaEmail: ¹drjaswindersingh@gku.ac.in, ²drsakshinagru172117@gku.ac.in

Abstract – Adolescent drug use seems to be a rampant area of concern around the world, especially for their health and development at all levels. This current study aims to investigate the role of physical education (PE) as a preventive and intervention strategy for substance use during the teenage years. Regular participation in exercise and sports contributes to improvement in physical fitness as well as stress management, resilience, and the adoption of positive lines of defense. PE enhances existing peer relationships and engages children in positive, organized physical activity so as to lessen the potential for unstructured, high-risk behavior. This study aims at establishing and understanding the correlation and interrelationships between PE and the mental health of the students. The findings of the study argue that PE has the potential to improve the overall well-being of the students with the added benefit of reducing drug usage in school.

Keywords –Physical Education, Adolescent Drug use, Substance Abuse Prevention, Mental Health, Peer Pressure.

1. INTRODUCTION

High schools are now partaking in ASHTR periods for growth development and self-growth time. During this one-hour time, this age group will begin to experiment with various growth issues, and one of them is drug use. The National Institute on Drug Abuse indicates that there is a significant portion of the school-aged population that engages in alcohol and drug use. This involves alcohol, drugs, and prescription drugs that are used with cannabis and are not integrated by doctors.

Drugs is one of the various issues in a society. Although strategies to confront it do exist. These are such issues as drug and alcohol awareness and informing physical styles of life. These views are not only the approach made by other programs that deal with the physical dangers of drugs. PE deals with not only physical activity but also mental and social activity. Social sports develop various types of support, such as lower stress activity, strategy discipline, and more.

As a result, it will lower the likelihood of drug use in teenagers. This research combines physical activity in her life with biases in sports. These include physical education surveys, sociability with academic power, and other studies. It shows that drug abuse among younger people is on the rise.

2. LITERATURE REVIEW

Author(s) & Year	Focus/Theme	Key Findings	Implications for Study
Martens & Webber (2018)	Substitution hypothesis; neuropsychological effects of exercise	Exercise releases endorphins, dopamine, and serotonin, improving mood and serving as a natural alternative to drugs.	The psychological attractiveness of drugs decreases with exercise.
Bailey (2006)	Social control theory; structured activity	PE provides routines and positive group affiliations that reduce deviant behaviors.	Physical activity itself is structured and thus minimizes potential for negative behaviors.
WHO (2022)	Global adolescent physical activity	Those teens who consistently exercised were 35% less likely to say they used drugs.	Strong empirical evidence that PE protects.
Smith et al. (2020)	PE and substance use in 1,200 students	Regular PE lowered reported alcohol and cannabis use by 30% .	PE activities in schools may drastically decrease drug usage.
Johnson & Lee (2019)	Peer pressure and sports	Sports participation linked to reduced susceptibility to peer pressure.	Positive peer networks prevent drug use.
Pate & O'Neill (2017)	Youth activity patterns	Consistent physical activity linked to decreased engagement in unhealthy behaviors.	Reinforces long-term pro

Table 1: Literature Review on Physical Education and Drug Addiction Prevention

2.1 Theoretical Background

The connection between exercise and decreased drug consumption is backed by various theories. Substitution theory proposes that exercise fulfills the desire for excitement and tension relief, lowering the attractiveness of drugs (Martens & Webber, 2018). Social control theory holds that organized schedules and healthy peer groups, both prevalent in PE and athletics, deter dangerous actions (Bailey, 2006).

2.2 Empirical Evidence

Research consistently supports these theories. Those teens who consistently exercised were 35% less likely to say they used drugs. Smith et al. (2020) observed a 30% drop in alcohol and cannabis use among students involved in school sports. Johnson and Lee (2019) showed that teens who played sports regularly were less likely to give in to peer pressure, a key factor in drug initiation.

2.3 Psychological Benefits

Exercise impacts brain chemistry by increasing neurotransmitters such as dopamine and serotonin. These enhance mood and decrease stress by providing natural reinforcers, which are similar to the ones produced by drugs (Martens & Webber, 2018).

2.4 Social and Emotional Benefits

Sports also help teens make friends, build self-esteem and shape a clearer sense of their identity. This positive social scene alleviates their necessity to bend to the approval of drug and alcohol using peers (Pate & O'Neill, 2017).

2.5 Gaps in Knowledge

Even with strong evidence, we still need to study how PE programs perform in various settings. For example, we should look at how they work in rural schools compared to city schools. We also need to explore how cultural differences affect the results.

Study	Sample Size	Key Findings	Year
Smith et al.	1,200	30% drop in alcohol/cannabis use with PE	2020
Johnson & Lee	850	Regular sports reduced peer pressure	2019
WHO Global Report	15,000	35% reduction in substance use with activity	2022

Table 2: Key Studies Linking PE to Reduced Drug Use

3. METHODOLOGY

3.1 Research Design

This research employed a blend of methods mixing surveys and interviews to gather both numbers and personal stories.

3.2 Survey Data

Three city schools participated, and 300 young students completed a survey that asked how much they exercise, whether they are stressed out and if they use drugs. The study split the students into groups based on how often they had PE: often (3+ days) sometimes (<3 days), or never.

Category	Number	%age
Male	150	50%
Female	150	50%
Ages 13–15	120	40%
Ages 16–18	180	60%

Table 3: Respondent Demographics

3.3 Interviews

Seven professionals, including two addiction counselors and five PE teachers, shared their experiences working with students around physical exercise and preventing drug use.

3.4 Data Analysis

Researchers used descriptive statistics to analyze the numbers and coded interviews to spot shared patterns.

4. RESULTS

4.1 Quantitative Findings

The survey showed students who often joined PE were much less likely to experiment with drugs.

PE Frequency	Tried Drugs	Never Tried Drugs
Regular (3+ days/week)	12%	88%
Irregular (<3 days)	28%	72%
None	45%	55%

Table 4: Drug Use vs. PE Participation

4.2 Qualitative Findings

Counsellors said students who were physically active had healthier coping skills and less anxiety. Teachers emphasized that PE promoted discipline, teamwork, and resilience—traits that protect against risky behaviour.

5. DISCUSSION

5.1 Protective Role of PE

Both surveys and interviews suggest that PE decreases the chances of adolescent drug use by offering students healthier options and routines.

5.2 Psychological Pathways

It lifts mood, lowers stress and enhances natural rewards, which don't have to be sought in a drink or a drug.

5.3 Social Pathways

In sport, children are in positive peer groups and they have a sense of belonging, reducing the impact of peers using drugs.

5.4 Policy and Education Implications

Schools should require PE in all grades, integrate mental health lessons into PE, and expand afterschool sports programs, especially in communities most at risk.

5.5 Limitations and Future Directions

This research looked only at schools in cities. Future studies need to explore rural areas cultural variations, results over time, and how effects differ based on gender.

6. RECOMMENDATIONS

- **PE classes even day of week:** All grade levels would have P.E. every other day passed in person for elementary schools up to middle school.
- **Combine PE with mental health lessons:** Include activities to teach resilience and coping skills during physical education.

- **Offer more activities:** Bring more afterschool sports programs to places at higher risk.
- **Teacher preparation:** Train PE teachers with basic tools to address substance abuse prevention.
- **Government involvement:** Authorities must back PE programs by providing funding and making them a priority in prevention plans.

7. CONCLUSION

Physical education is always more than just a subject in school. It's acted like a shield for teen drug use. This research demonstrates that boys who engage in regular PE are more able to cope, become better friends and more resistant to peer pressure and stress. The incorporation of good quality physical education as a part of school curriculum will be significantly among the youth with regards to substance abuse and promoting mental and physical wellness. This early step will leave a positive effect on students' health-related decisions and growth.

Benefit	Impact on Adolescents
Improved mental health	Lower anxiety, depression, and cravings
Higher self-esteem	Increased value and self-assuredness
Positive peer groups	Reduced peer pressure toward drugs
Structured routines	Less doing nothing, less risky behaviors
Sportsmanship/resilience	Improved stress tolerance and mood control

Table 5: Benefits of PE in Preventing Drug Use

REFERENCES

- [1] Bailey, R. (2006). Physical education and sport in schools: A review of benefits and outcomes. *Journal of School Health*, 76(8), 397–401. <https://doi.org/10.1111/j.1746-1561.2006.00132.x>
- [2] Battista, R. A., Pivarnik, J. M., Dummer, G. M., Sauer, N., & Malina, R. M. (2018). The relationship of physical activity and sport participation to substance use among adolescents: A review. *Health Education Research*, 33(3), 215–227. <https://doi.org/10.1093/her/cyy015>
- [3] Chen, C. Y., & Storr, C. L. (2009). Alcohol use and health-related quality of life among youth in Taiwan. *Journal of Adolescent Health*, 44(3), 310–318. <https://doi.org/10.1016/j.jadohealth.2008.07.002>
- [4] Diehl, K., Thiel, A., Zipfel, S., Mayer, J., Litaker, D. G., & Schneider, S. (2012). How healthy is the behavior of young athletes? A systematic literature review and meta-analyses. *Journal of Sports Science & Medicine*, 11(3), 346–368.
- [5] Eime, R. M., Young, J. A., Harvey, J. T., Charity, M. J., & Payne, W. R. (2013). A systematic review of the psychological and social benefits of participation in sport for children and adolescents: Informing development of a conceptual model of health through sport. *International Journal of Behavioral Nutrition and Physical Activity*, 10(98), 1–21. <https://doi.org/10.1186/1479-5868-10-98>

- [6] Fredricks, J. A., & Eccles, J. S. (2006). Is extracurricular participation associated with beneficial outcomes? Concurrent and longitudinal relations. *Developmental Psychology*, 42(4), 698–713. <https://doi.org/10.1037/0012-1649.42.4.698>
- [7] Johnson, A., & Lee, M. (2019). Physical activity as a protective factor against drug initiation. *Youth & Society*, 51(4), 456–473. <https://doi.org/10.1177/0044118X18756432>
- [8] Kwan, M., Bobko, S., Faulkner, G., Donnelly, P., & Cairney, J. (2014). Sport participation and alcohol and illicit drug use in adolescents and young adults: A systematic review of longitudinal studies. *Addictive Behaviors*, 39(3), 497–506. <https://doi.org/10.1016/j.addbeh.2013.11.006>
- [9] Lisha, N. E., & Sussman, S. (2010). Relationship of high school and college sports participation with alcohol, tobacco, and illicit drug use: A review. *Addictive Behaviors*, 35(5), 399–407. <https://doi.org/10.1016/j.addbeh.2009.12.032>
- [10] Martens, R., & Webber, T. (2018). Exercise, endorphins, and addiction: A psychological analysis. *Addictive Behaviors Reports*, 8, 40–47. <https://doi.org/10.1016/j.abrep.2018.07.002>
- [11] National Institute on Drug Abuse. (2021). Monitoring the Future Survey: High school and youth trends. NIDA. Retrieved from <https://nida.nih.gov>
- [12] Pate, R. R., & O'Neill, J. R. (2017). Youth physical activity patterns and the prevention of unhealthy behaviors. *Pediatric Exercise Science*, 29(2), 159–166. <https://doi.org/10.1123/pes.2016-0101>
- [13] Smith, J. R., Thompson, L. M., & Howard, P. K. (2020). The impact of school sports on youth substance use. *Journal of Adolescent Health*, 67(3), 345–352. <https://doi.org/10.1016/j.jadohealth.2020.03.012>
- [14] Ströhle, A. (2009). Physical activity, exercise, depression and anxiety disorders. *Journal of Neural Transmission*, 116(6), 777–784. <https://doi.org/10.1007/s00702-008-0092-x>
- [15] World Health Organization. (2022). Global status report on physical activity 2022. WHO. Retrieved from <https://www.who.int>

Received: 20.07.2025Accepted: 16.09.2025Published: 25.09.2025Page No: 61 – 69DOI: [10.5281/zenodo.17207121](https://doi.org/10.5281/zenodo.17207121)✉: gkujournal@gku.ac.in

Need of Yoga and Meditation for Balanced Life Style

¹ Mr. Rohtash, ²Dr. Rajwinder Kaur¹ Research Scholar, Faculty of Physical Education, Guru Kashi University, Talwandi Sabo, Bathinda, Punjab, India.² Assistant Professor, Faculty of Physical Education, Guru Kashi University, Talwandi Sabo, Bathinda, Punjab, India.Email: ²dr Rajwinder.171414@gku.ac.in

Abstract – Mental problems are on the rise, and for traditional allopathic treatments to treat diseases, it is always not enough. Population-level mental health promotion strategies are increasingly called for. One popular form of complementary and alternative therapy is the ancient Indian practice yoga, which uses a combination of body postures, breathing exercises, as well as meditative methods to address mental and physical health. It has been well documented that yoga can reduce stress, anxiety, and depression, as well as improve the quality of life. Studies have shown that daily practice has a positive effect on mental health, mood and emotional balance.

And remember, Yoga is a complete health system not just an exercise regimen. Practised to a high standard, it helps men bond their mind with body and balance and harmony are the results. The term "yoga" itself is derived from the Sanskrit root "yuj," which translates to unite or join, indicating a harmonious union between the self and the universe. The goal of yoga: Is self-realization and freedom from suffering bringing us in a state of mental, emotional liberation. Yoga Introduction Originating in ancient India, Yoga has a history of thousands years and is still the most effective way to physical, mental and spiritual health issues caused by living in today's busy world with over work.

Keywords: Mental well-being; Quality of life; Yoga; Depression; Mental health promotion

1. INTRODUCTION

Yoga is an ancient Indian practice of physical and spiritual exercise. Around the 2nd century B.C., Patanjali believed that the Yoga Sutras formalized it. "Yoga" itself means "union," "yoke," or "joining." By the eighth century, yoga was a means for connecting God and an imperfect man. To that end, the idea is to reunite mind, body and spirit. Yoga trains the mind to concentrate and relax in deep breathing. Practice leads to mind control. In addition to the physical benefits of performing yoga, one can be rest assured that it will also act as a treatment for the mind in order to cure/improve their mental health (Nayak 2016).

In the whirlwind of modern life, where demands and distractions vie for our constant attention, achieving a balanced lifestyle can feel like navigating a raging sea. Fortunately, we have an ancient tool at our disposal: meditation. This is a discipline dating back thousands of years, with transcultural and religious appeal, that provides a powerful way to achieve inner peace, focus and well-being. With daily meditation, we can cultivate a still space that allows for the navigation of life's waves.

Not surprisingly, meditation works to decrease tension and anxiety, clearly a major advantage. But in this day and age, we have too much stimuli feeding our neurological systems. The practice of meditation calms the mind and induces deep relaxation. Focusing our attention on the breath or a mantra helps teach our thoughts to respond less reflexively to stress. The beneficial effects of meditation such as lowering blood pressure, better sleep or greater emotional resilience are scientifically proven.

In addition to helping us overcome stress, meditation also enhances our focus and concentration. In a time of information overload, our minds are constantly tugged in several directions. Meditation enables us to build a “muscle” of focused attention so that we can direct our attention in a better way on what is happening, whether it be finishing a work project or having a meaningful conversation. This new found attention flows over into all areas of our lives and leads to increases in productivity, better choices.

Furthermore, meditation fosters self-awareness. The more we know how to witness thoughts and emotions without reacting the most enlightened we become about ourselves. This heightened awareness helps us to recognize negative thought and feeling patterns, which is the first step before being able to form a new response instead of simply reacting out of habits. Through regular practice, individuals who meditate may develop a greater sense of inner peace and acceptance and as a result have better relationships with others and a more positive perspective on life.

One of the most beautiful aspects of meditation is that anyone can do it. Unlike the many stress-reduction methods, meditation does not require any special apparatus or space. whether you have five minutes or an hour there’s a way to make daily meditation fit into even the busiest schedule. Meditation comes in many Flavors, with some types that emphasize being aware of the current moment — whether it's feeling your breath move in and out of your body or listening to birds singing outside — to others where audio recordings will take you through certain visualization exercises. Playing around with a variety of writing styles can help you discover what works best for you.

Meditation can be a tool to foster inner calm, concentration and wellness in an increasingly stress-filled world. We can develop both emotional and mental fortitude to help us better navigate the challenges we face in our modern world, allowing us to lead a more balanced and enriched life. All right then, deep breath, singer off a quiet corner for yourself and meditate your way on inside.

The path of yoga is composed of the eight yogic limbs which include Yama (ethical standards), niyama (self-discipline), asana (postures), pranayama (life force practices), pratyahara (sensory transcendence), dharana (concentration), dhyana(meditation) and samadhi (divine bliss). Yoga's Sanskrit etymology is “to unite.” This ancient South Asian system is based on the merging of personal and collective self, and mind and body (Shroff, 2011).

One’s quality of life is largely determined by their mental health. Many people all around the world suffer from psychiatric disorders like stress, anxiety and depression thereby placing heavy burden on individual wellbeing as well as society's. The traditional treatments for mental disorders are pharmaceuticals and psychotherapy. Thus, other than conventional treatments for mental disorders such as YOGA, the alternative methods of treatment... Brain Consumers Nitro: Anew Pill That Contains All The “Important” Vitamins Can Improve Memyps- Reveals Credit Unonityous Hack from Tedxygoodted Experiment Another Problem-Like About Your Body? YOGA: A timeless practice for self-rejuvenation, yoga has been used for thousands of years to improve overall physical and mental health.

Yoga improves mental and physical health through asanas, pranayama, and dhyana meditation. Yoga balances body and mind to offer serenity and tranquility. Meditation helps focus, increase willpower, and reduce stress, while breathing exercises and postures strengthen and calm the body.

This scoping review examines yoga's effects on mental health and categorizes and summarizes data on anxiety, stress, depression, and other mental health conditions.

2. RESEARCH METHODS:

The study we performed involved searching peer-reviewed medical literature for 300 individual studies and 30 reviews on yoga and mental health. There will not likely be regulations on this type of research for the foreseeable future and since it is still a relatively new field, we have differences in sample size presence,

trial length variances as well as variations in form of yoga which are hard to compare one study with another.

3. REVIEW OF LITERATURE:

"In many of these studies that have been reviewed by experts in the field, we only found about 300 original studies and about 30 reviews of these original studies that were discussing health and yoga. Since this is a relatively young research area, it's not so easy to compare studies with each other because trial length, sample size and the sort of yoga employed can differ from one to the next.

Studies have found that yoga practice lowers mental health problems. Research on yoga and stress, anxiety and depression all showed improvements.

Parks & Steelman (2008): "There is a yogic aphorism that says: the flexible body leads to the control of a flexible mind." His cures anger, sadness and brings tolerance and forgiveness. By imitating nature, yoga teaches students how to find their way "home" to themselves. There are also animal and plant-inspired positions, such as the tree pose, the dog pose, the cat pose, or snake pose.

Streeter et al. (2010), your brain releases endorphins and other neurochemicals such as serotonin and GABA to regulate your mood and diminish anxiety. Yoga itself, with its physical asanas (poses) and breathing exercises, triggers the release of these neurochemicals and helps improve mood while reducing anxiety. Positive effects of yoga on mental health have been reported in both healthy and diseased individuals. One study reported such benefits after just one yoga session, where mood was enhanced and anxiety and depression reduced.

Rocha et al. (2012) put forward a number of hypotheses regarding the effects of yoga on mental health. The controlling function of the autonomic nervous system (ANS) is also concerned. Yoga increases parasympathetic and decreases sympathetic activity in the ANS. This ANS imbalance decreases blood pressure, and slows heart rate – a sign of stress.

In a meta-analysis of 32 randomized controlled trials, yoga as an intervention was shown to be effective at reducing stress, anxiety and depression symptoms when compared to controls (Cramer et al., 2013).

Khalsa et al. (2014): Treatment of mental illness with Yoga. For people with anxiety, strenuous yoga practices that build physical effort and mindfulness may offer some benefit; those with PTSD might be helped by restorative yoga (focused on grounding and relaxation).

3.1 Patient experiences of yoga and meditation:

- i. **Social Support & Communal Experiences:** His common humanity allowed him to survive in that it gave him a sensation of common consciousness — all is one and interdependent. It's comfortable to walk away believing I know everyone's story, not just my own. Depression makes you feel very alone, but feeling whole and large is worth more.
- ii. **Managing anxiety and ruminating:** I feel good about myself when I am done with yoga." Ramirez11, I preferred to focus on the good rather than the bad – not did do, couldn't control.
- iii. **Capability, Empower:** "I feel like I can do this for myself, and that motivates me to try other things that maybe I wouldn't have tried before."

4. OBJECTIVES:

- The study had two objectives to fulfil.
- To check out why yoga is all the more important for a healthy lifestyle.
- To explore about meditation in a balanced life.

5. DATA COLLECTION:

An institution tutor helped to develop an original questionnaire tool in order to obtain the data needed for this study.

6. SAMPLING METHOD:

A total of 100 subjects were included in this study through Simple Random Sampling from Kurukshetra, Haryana.

7. STATISTICAL TOOL:

The relationship between yoga and meditation in a more balanced life style was investigated using regression analysis.

8. SURVEY DESIGN:

The survey was distributed to the respondents through Google Forms. The questionnaire had 4 sections: demographic characteristics and questions to elicit the perception of yoga and meditation. Answers were quantified on a 5-point Likert scale from 1 to 5, depending on how the participants felt about yoga and meditation.

9. DATA ANALYSIS

Table 9.1: Respondent Gender

Gender	Frequency	%'age
Male	63	63%
Female	37	37%

Gender of Respondents

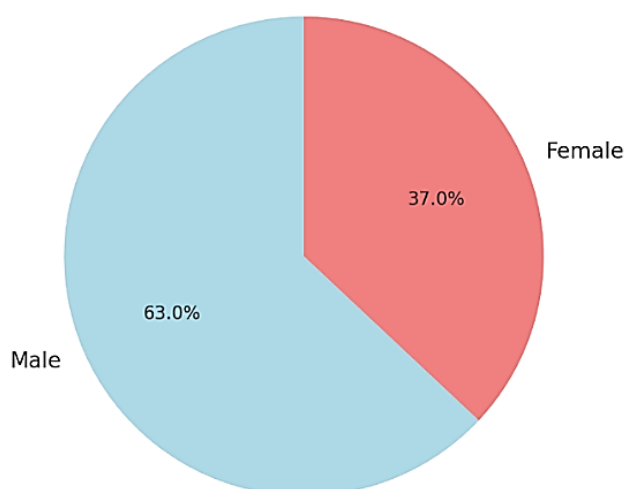


Figure 9.1: Shows the percentage of men and women who took the survey.

Table 9.2: Age of Respondents

Age Group	Frequency	%age
20-23	24	24.5%
24-30	28	28%
31-40	24	24.5%
41-50	18	18.5%
Above 50	6	4.5%

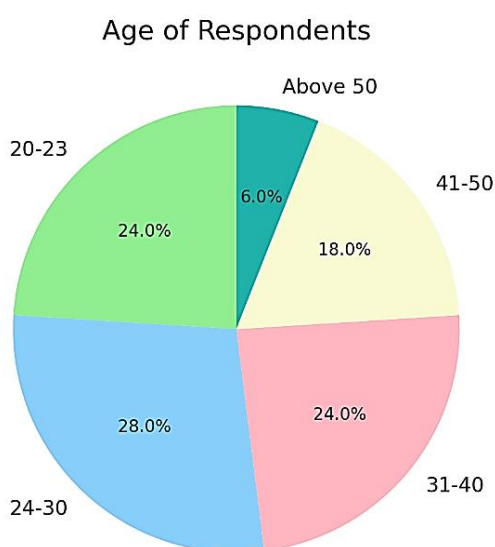


Figure 9.2: Age of Respondents shows participant age distribution.

Source: Primary Source

Table 9.3: Highest Qualification

S.No.	Highest Qualification	Frequency	%
1	Secondary School	12	12%
2	Diploma	7	7%
3	Graduation	28	28%
4	Post Graduation	44	44%
5	Doctorate	9	9%

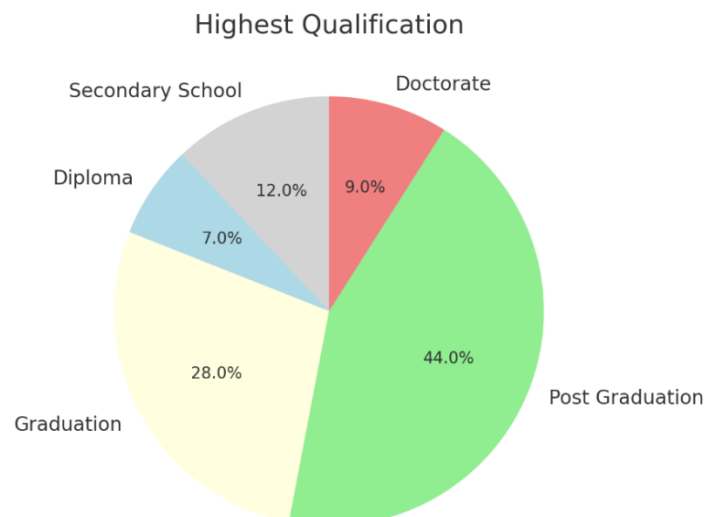


Figure 9.3 showing the distribution of respondents' educational qualifications.

Table 9.4: Current Employment Status

S.No.	Current Employment Status	Frequency	%
1	Employed	28	28%
2	Self Employed	18	18.5%
3	Home maker	14	14%
4	Student	26	25.5%
5	Not Employed	14	14%

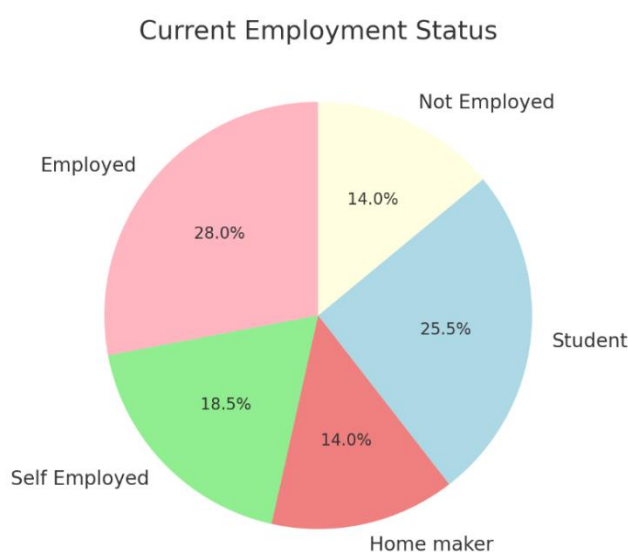


Figure 9.4 shows that 28% of respondents were working, 26% were studying, and 18% were self-employed.

Source: Primary Source

Table 9.5: Regression Analysis Results

Variable	Male	Female
R ²	0.393	0.396
F-Statistic	33.405*	37.839*
Constant	0.289	0.301
Product Features	0.198*	0.008
Office Services	0.006	0.296*
Pre-Sale Services	0.290*	0.196***
Post-Sale Services	0.296*	0.198***

Regression Analysis Results (Table 5) - Cylindrical Chart

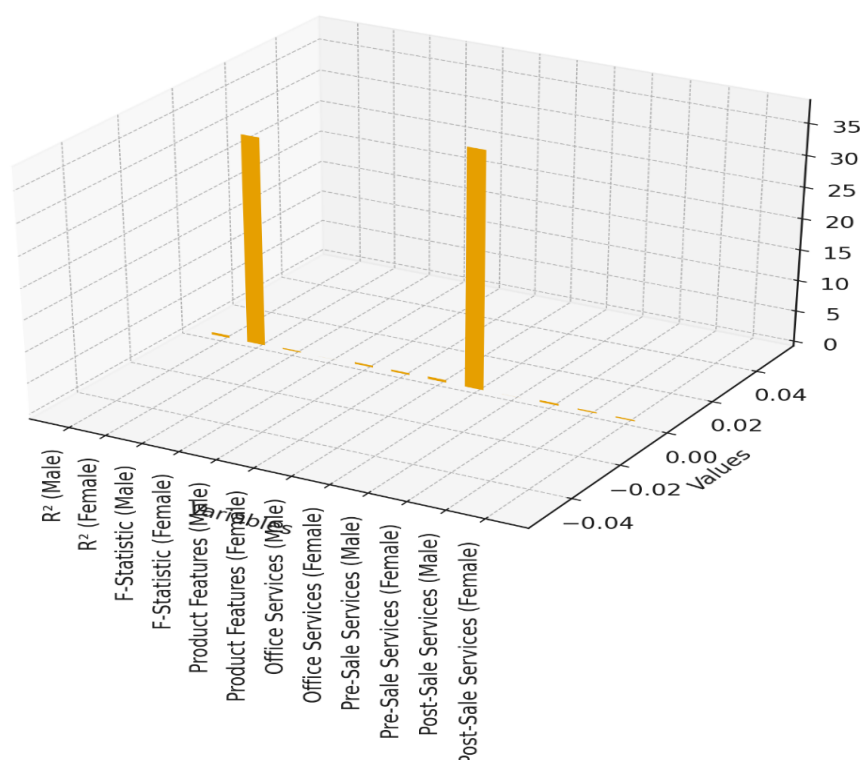


Table 9.5 presents the results of a regression analysis, including R² and F-statistics, as well as coefficients for different factors (product features, “office” services, presale services and postsale service) for both male and female respondents.

10. DISCUSSION:

Indeed, the very opposite is true: Meditation, rather than an escape from action and commitment, is instead a voluntary suspension of dispersion of one’s mental activity. We’ve learned, in different ways, to concentrate our minds and watch our thoughts without judging them or ourselves — and to cultivate a sense of inner peace. This adventure of inner travels brings so many benefits to all of our life.

Stress and anxiety relief are great advantages of meditating. So, by concentrating on the now we disrupt the habit of being concerned about past or future. This allows the body to relax and enter a state of deep physiological calm, lowering blood pressure and reducing the stress hormone cortisol. With a peaceful mind and strong body, our capacity to meet the daily struggles in life with grace is enhanced.

Meditative practice also aids in focus and concentration. Focused attention, on something like the breath, conditions the mind to discount distractions and enhance its ability of being able to hold focus.

This translates into sharper thinking, improved productivity, and a greater capacity to learn and absorb information.

Meditation improves emotional health. We come to know ourselves through witnessing our thoughts and feelings without judging them. Self-awareness allows us to push back against feelings of suffering, and practice self-compassion. We grow in emotional intelligence, improving our relationship and communication.

Meditation is good for more than just your mental and emotional health. Meditation has also been shown to strengthen the body's immune system, improve sleep and decrease chronic pain. Life in balance begins with this complete wellness guide.

Yoga has the potential to promote public mental health. Reasonable, affordable, accessible, and independent. Yoga is health, for the individual and the community. Similar to tai chi, qigong and meditation, it is a practice of the community. Mental health benefits of attending yoga courses in schools, work and other settings can be seen (Harfiel et al., 2011). Even though it doesn't directly solve the societal triggers of mental illness, yoga still soothes.

11. CONCLUSION:

The study revealed that yoga daily dose can make a huge difference in mental well-being. It is especially successful when dealing with stress, anxiety and depression as well as a feeling of general well-being and health. Several physiological and psychological mechanisms are posited to underlie the beneficial effects of yoga. They range from the production of endogenous opioids and neurochemicals that mitigate pain and boost mood to the regulation of autonomic nervous system functions such as heart rate and breathing. Furthermore, yoga also helps in increased emotional regulation and cognitive function which lets a person with experience of such thing to deal with their emotion well and think clearly. Yoga can be safely practiced at low cost and is available to virtually anyone, and regardless of fitness or age – thus being an instant adjunctive therapy for mental health. However, additional research is necessary to establish which are the most effective yoga therapies for various mental health disorders and how exactly does yoga act on mental health. This could facilitate a customising of yoga interventions for people interest in mental health.

REFERENCES

- [1] Cramer, H., Lauche, R., Langhorst, J., & Dobos, G. (2013). Yoga for depression: A systematic review and meta-analysis. *Depression and Anxiety*, 30(11), 1068-1083.
- [2] Hartfiel N, Havenhand J, Khalsa SB, Clarke G, Krayner A (2011) Effectiveness of yoga for the improvement of well-being and resilience to stress in the workplace. *Scand J Work Environ Health* 37: 70-76.
- [3] Khalsa, S. B., Hickey-Schultz, L., Cohen, D., Steiner, N., & Cope, S. (2014). Evaluation of the mental health benefits of yoga in a secondary school: A preliminary randomized controlled trial. *The Journal of Behavioral Health Services & Research*, 41(2), 140-154.

- [4] Nayak, A. , K. , (2016) .Effect of yoga on mental and physical health. International journal of physical education sports and health, 3(5):268-270.
- [5] Parks KM, Steelman LA (2008) Organizational wellness programs: A meta-analysis. J Occup Health Psychol 13: 58-68.
- [6] Rocha, K. K., Ribeiro, A. M., Rocha, K. C., Sousa, M. B., Albuquerque, F. S., Ribeiro, S., & Silva, R. H. (2012).Improvement in physiological and psychological parameters after 6 months of yoga practice. Consciousness and Cognition, 21(2), 843-850.
- [7] Shroff F (2011) We are all one! A Yogic travel tale. J Postcolonial Cultures Societies 2: 124-128.
- [8] Streeter, C. C., Whitfield, T. H., Owen, L., Rein, T., Karri, S. K., Yakhkind, A., ...& Jensen, J. E. (2010). Effects of yoga versus walking on mood, anxiety, and brain GABA levels: A randomized controlled MRS study. The Journal of Alternative and Complementary Medicine, 16(11), 1145-152.

Received: 18.07.2025Accepted: 16.09.2025Published: 25.09.2025Page No: 70 – 76DOI: [10.5281/zenodo.17207222](https://doi.org/10.5281/zenodo.17207222)✉: gkujournal@gku.ac.in

Analysis of Physical Fitness Components Among Athletes and Non-Athletes

¹Dr. Aarif Majeed, ²Mr. Lakhveer Singh, ³Mr. Gurdeep Singh^{1,2,3}Assistant Professor, Faculty of Physical Education, Guru Kashi University, Talwandi Sabo, BathindaEmail: ¹dmajeed171831@gku.ac.in, ²lakhveer04041996@gmail.com,
³gurdeepsingh@gku.ac.in

Abstract – The main goal of this study was to find out how certain aspects of physical health differ between athletes and people who do not play sports. The study examined 120 male students from Guru Kashi University, ages 17 to 23. There were 60 athletes and 60 non-athletes. The four main fitness factors analyzed were Strength, Endurance, Flexibility, and Agility. Standardized tests measured each trait. A t-test with a 0.05 significance threshold showed that the health statuses of the two groups were significantly different. A statistically significant gap was found when comparing athletes to non-athletes in health-related physical fitness. This indicates that regular athletic training influences physical fitness.

Keywords – Agility, Athletes, flexibility, muscle endurance, strength, and non-athletes.

1. INTRODUCTION

Over the last ten years, the public has become increasingly aware of the health benefits of exercise and physical activity. Interest in preventive medicine has thus grown by leaps and bounds. Studies have found that exercise is essential to mitigating risk for cardiovascular disease, as well as recovery from it. This awareness, and emphasis on health and fitness as well as its benefits have led to an explosion of fitness programs in the public, private and corporate sectors. As a result, the employment outlook for fitness and exercise professionals has never been better. More physical education trained persons are becoming involved in preventative and restitutive exercise programming, and the trend is expected to continue. The ability to perform routine functions well without getting tired is called physical fitness. It plays a major part in well-being and health. Over the past 25 years, a series of studies have shown how beneficial regular exercise is for good health. Most people visit physicians for general ailments such as chronic tiredness due to lack of exercise, according to national health statistics.

2. METHODOLOGY

The method section of a research paper on the differences in physical health between athletes and non-athletes. Here's what to know:

- i. **Subject matter:** The study seeks to compare the physical health of athletes with that of non-athletes. It actually examines different aspects of fitness (e.g., strength, endurance, flexibility and agility) to see if health disparities between these two populations exist.
- ii. **Participants:** A total of 120 (60 athletes and 60 non-athletes) students from Guru Kashi University formed the sample of the study. The study population age was between 17 and 23 years. These age groups are young adults, a period often considered crucial to physical development and fitness.

- iii. **Comparison of the Groups:** The athletes and non-athlete's groups were compared utilizing a t-test. A t-test is a popular statistical test used to compare the means (averages) of two groups and ascertain if the differences observed between them are statistically significant. In other words, the t-test provides a measure of whether the differences that are observed can be explained by what is being measured (in this case athletic training), instead of just flipping a coin.
- iv. **Hypothesis Testing at α (0.05):** H_0 :1 Athletes will score higher on measures of physical health, in comparison to non-athletics. Whether the differences are statistically significant is tested at a significance level of $\alpha=0.05$. This says if the we think the chance of getting a result as different to what we would have expected at random is less than 5%, then we have evidence of difference. In loose terms, if the p-value is less than 0.05 then we are not justified in rejecting the hypothesis that athletes do better than non-athletes.

3. RESULTS AND TABLES

- **Muscular Strength**
 - **Test Item:** Grip Dynamometer
 - **Unit of Measurement:** Kilograms
- **Muscular Endurance**
 - **Test Item:** Sit-ups (Bent Knees)
 - **Unit of Measurement:** Counts
- **Flexibility**
 - **Test Item:** Sit and Reach
 - **Unit of Measurement:** Centimeters
- **Agility**
 - **Test Item:** Shuttle Run
 - **Unit of Measurement:** Seconds

Table 3.1 Compares the right-hand grip strength of athletes and non-athletes.

Groups	Mean	S.D.	M.D.	OT	TT
Athletes	32.32	6.36	5.22	4.20	2.0
Non- athletes	27.1	6.02			

Table 3.1 highlights a significant difference in the right-hand grip strength between athletes and non-athletes. The average score for athletes (32.32) is noticeably higher than the score for non-athletes (27.1), resulting in a mean difference (M.D.) of 5.22. The t-test analysis produced a calculated t-value of 4.20, which is greater than the critical t-value of 2.0 at the 0.05 significance level. This statistically confirms that athletes possess superior right-hand grip strength compared to non-athletes, supporting the hypothesis that athletic training improves strength in this area. The results are visually represented in **Graph 3.1**.

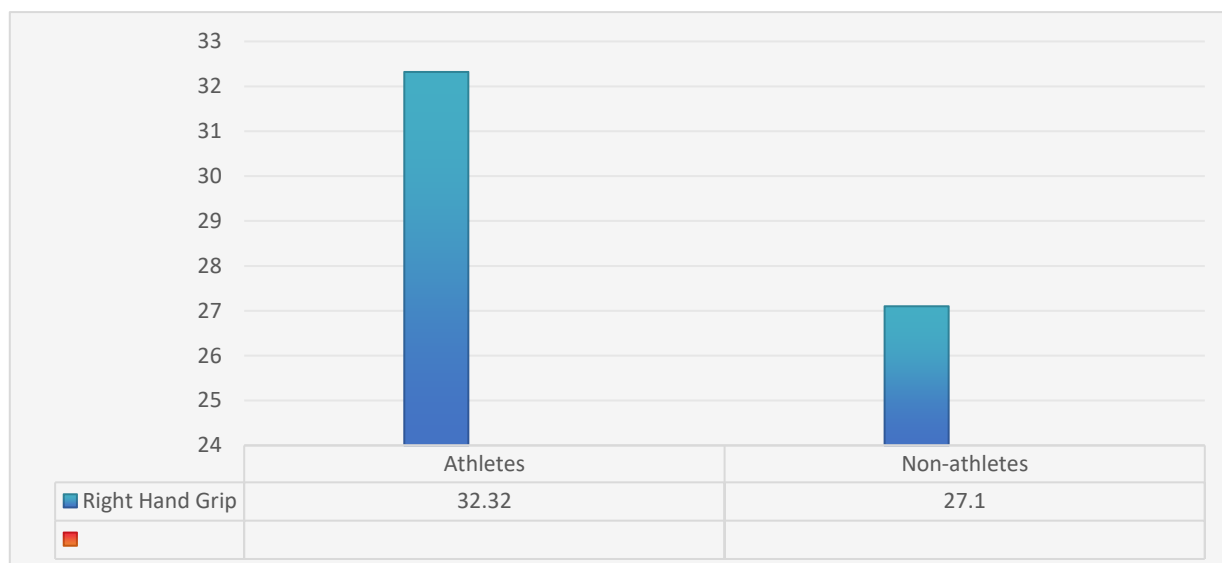


Table 3.2 shows the difference in left-hand grip strength between athletes and non-athletes.

Group	Mean	S.D	M.D	OT	TT
Athletes	28.5	7.40	5.43	5.77	2.0
Non-athletes	23.07	4.06			

Table 3.2 illustrates a clear difference in the mean values between the two groups. The average score for athletes is 28.5, significantly higher than the average score of 23.07 for non-athletes, leading to a mean difference of 5.43. To confirm this, a t-test was performed. The calculated t-value of 5.77 exceeds the critical t-value of 2.0 at the 0.05 significance level. This supports the conclusion that athletes have better left-hand grip strength than non-athletes, confirming the researcher's hypothesis. These findings are shown in **Graph 3.2**.

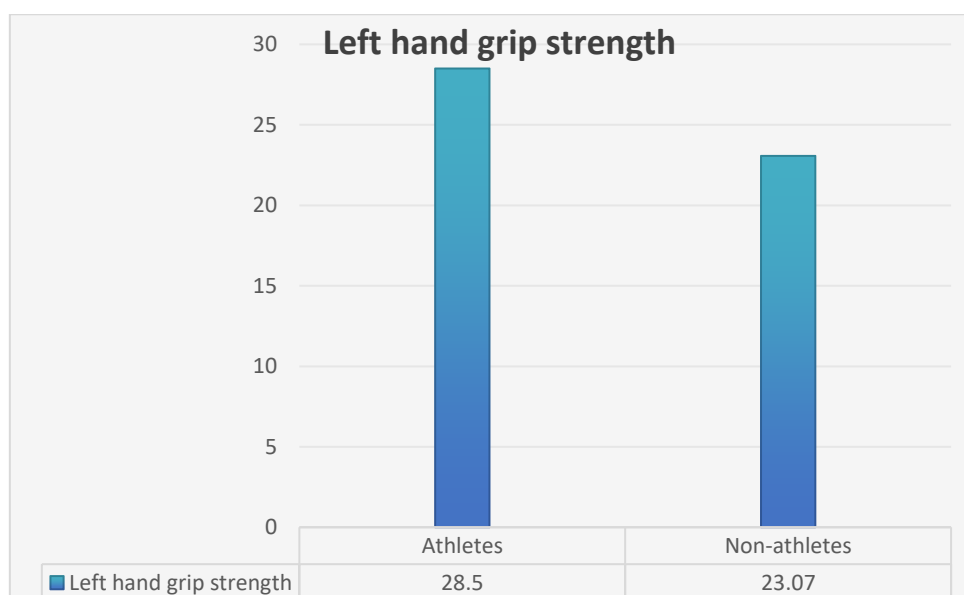


Table 3.3 compares muscular endurance between athletes and non-athletes.

Group	Mean	S.D	M.D	OT	TT
Athletes	38.53	7.43	10	9.65	2.0
Non-athletes	28.53	2.98			

As shown in Table 3.3, the means of two types are quite different. Athletes on an average score 38.53 points and non-athletes' average score is 28.53 points which shows a difference of 10 pts between athletes and non-athletes. We can test if this difference is significant by using a t-test. The calculated t-value of 9.65 is greater than the critical t-value of 2.0 at $\alpha = .05$. That trained runners beat normal population levels for muscle endurance is a key element for our study to put emphasis on. **Graph 3.3** displays these outcomes.

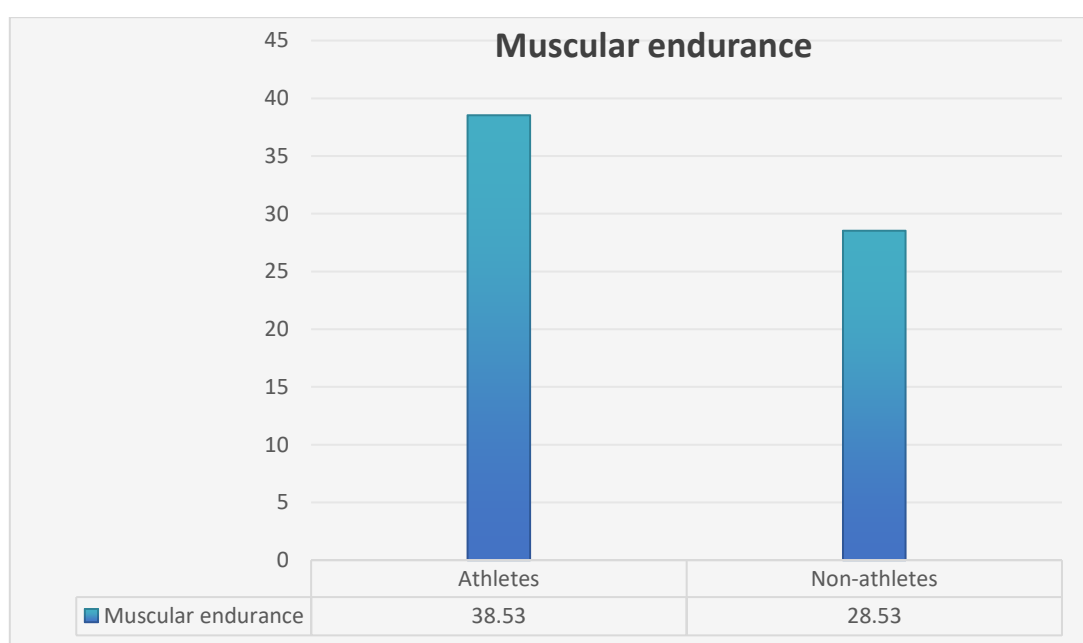


Table 3.4 shows the difference in flexibility between athletes and non-athletes.

Group	Mean	S.D	M.D	OT	TT
Athletes	18.1	4.03	4.53	7.13	2.0
Non-athletes	13.57	3.72			

Table 3.4 demonstrates a clear difference in the mean values. Athletes have an average score of 18.1, which is notably higher than the average of 13.57 for non-athletes, resulting in a mean difference of 4.53. A t-test was conducted to confirm this difference. The calculated t-value of 7.13 exceeds the critical t-value of 2.0 at the 0.05 significance level. This indicates that athletes have better flexibility compared to non-athletes, supporting the researcher's hypothesis. These findings are shown in **Graph 4**.

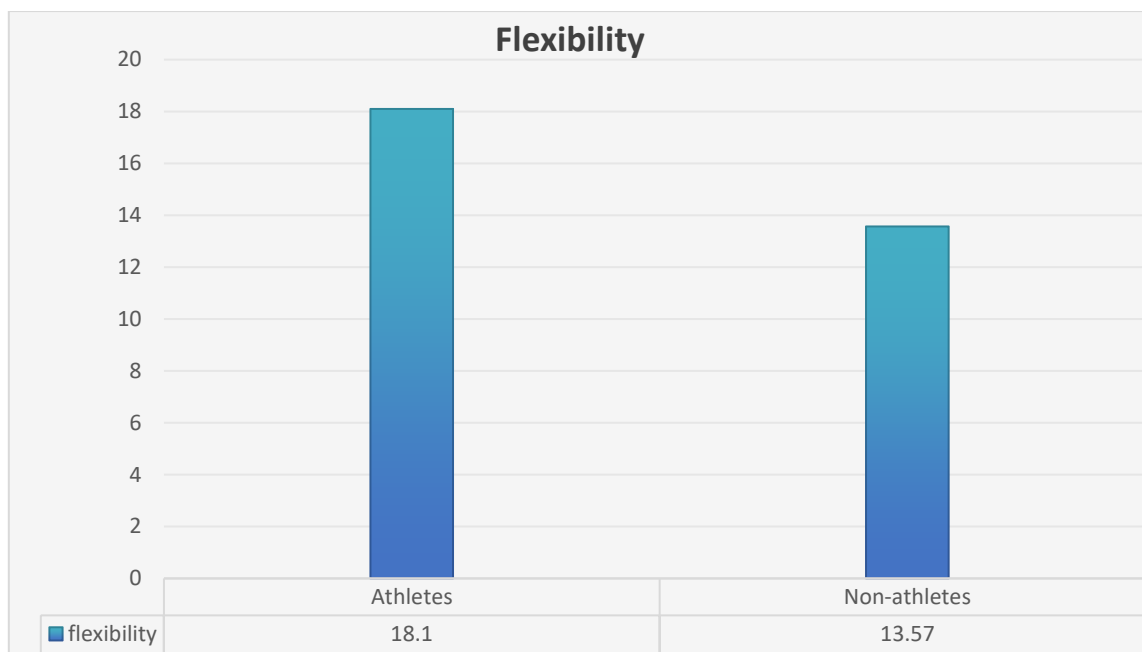
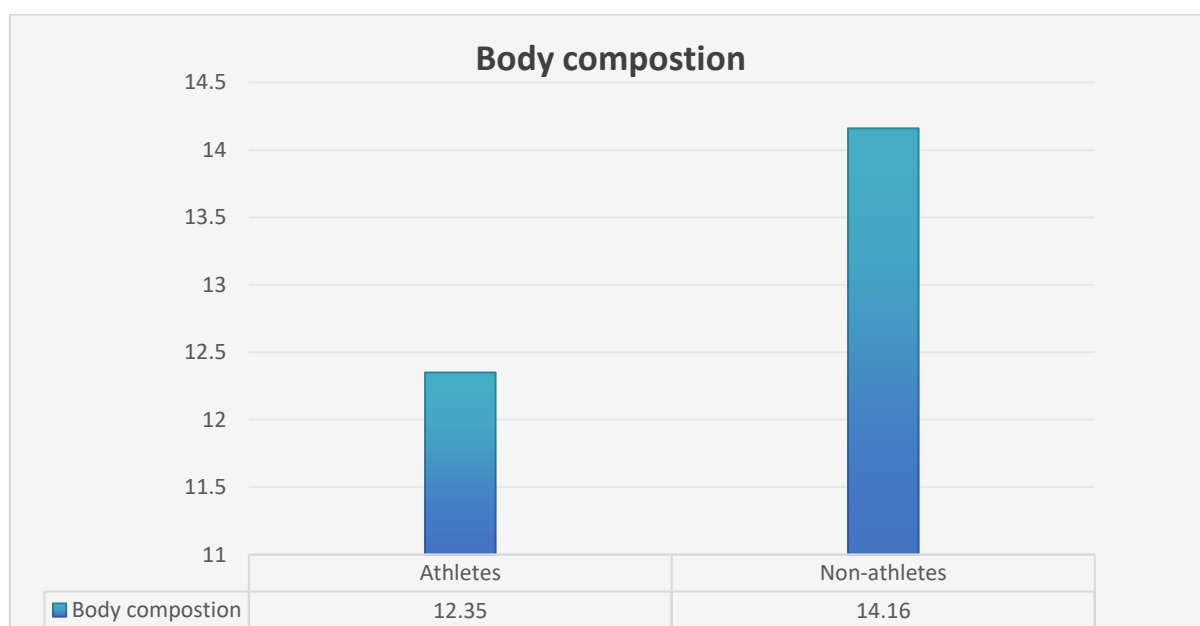


Table 3.5 compares athletes and non-athletes in agility.

Group	Mean	S.D	M.D	OT	TT
Athletes	12.35	0.73	1.81	13.44	2.0
Non-athletes	14.16	0.77			

It can be seen from Table 3.5 that the means of two groups have greater difference. The difference between athletes (12.35) and non-athletes (14.16) is 1.81 points as a mean value. We are able to test this difference via a t test. At the 0.05 level of significance, the calculated t-value of 13.44 is greater than the critical t-value of 2.0. This lends support to the claim of the investigator that athlete perform better in movement times than non-athletes. **Graph 3.5** presents these results.



4. FINDING

Statistically athlete and non-athlete also differ significantly by several physical fitness components as per the study. Athletes demonstrated significantly greater right and left-hand grip strength, muscular endurance, flexibility, and agility compared to non-athletes. Statistical analysis indicated that these differences were not coincidental and the absolute values of t-tests between two groups reached a significant difference at significance level of 0.05. These results indicated that athletes have better physical fitness traits due to regular training and exercise which are important for general health and performance. The findings are indicative that regular engagement in sports appears to have beneficial effects on physical fitness (muscular strength, muscular endurance, flexibility and agility) status. These results highlight the significance of physical education and athletic training to benefit children's better health.

5. CONCLUSION

In conclusion, this research shows that athletes are much better equipped than non-athletes in strength, muscular endurance, flexibility, and agility. The findings reveal strong evidence for the beneficial effects of athletic training on physical fitness. For both handgrip tests, athletes presented higher strength along with greater endurance, flexibility and agility in comparison to non-athletes. This shows the advantages of regular physical exercise, not only in fitness and well-being. Schools and universities had to have students participate more in physical activities as this could lead to better health and fitness. What it shows, too, is that the value of PE and joining in sports is not solely from a participation perspective – they are valuable as long-term health-promoters especially for young adults.

6. CONFLICTS OF INTEREST

This study was carried out with academic honesty; there was no falsification of data and results were presented honestly without any interference from outside factors. No financial, professional or personal conflicts of interest exist that might have influenced the study findings. This research intends to enhance the understanding of physical health and fitness level differences in athletes on behalf non-athletes, under no bias or external pressure. This research adhered to all the principles of ethical guidelines and was based only on data analysis.

7. DECLARATION

All research and writing in the article "Analysis of Physical Fitness Components Among Athletes and Non-Athletes" is my own. I have not encountered any prior publication of this material. I promise that the relevant authorities will have the final say if this paper is later deemed invalid under fundamental standards.

REFERENCES

- [1] Ahmad Qureshi (2019), Physical Fitness Among Sports and Non-Sports Persons a Comparative Study. Research Review International Journal of Multidisciplinary, Volume 04, Issue 02
- [2] Chouhan Sav Singh, "Comparative Study of Health Status, Mental Health Status, Anthropometric Measurements and Physical Fitness of Rural and Urban Girls of Madhya Pradesh", Ph.D. Thesis, Devi Ahilya Vishwavidyalaya, Indore, 2019.
- [3] Deborah A. Wuest & Charles A. Bucher (1992), Foundations of Physical Education & Sports, (B.I. Publication, New Delhi) p.p 347
- [4] Deborah Wuest A, Charles Bucher A. (1992), Foundations of Physical Education and Sport, B.I. Publications. New Delhi

- [5] Devinder Kansal K. (1996), Test and Measurement in Sports and Physical Education, DVS Publication, Delhi
- [6] Dhirendre Singh Chauhn (2018), Comparative Study of Physical Fitness Variables of Urban and Rural Area Players. International Journal of Physical Education and Sports Science, volume 13, Issue No. 04
- [7] Harneet Singh (2015), Comparative Study on Selected Physical Fitness and Physiological Variables between Volleyball and Handball Players. European Journal of Physical Education and Sports, Volume 10, Issue 4
- [8] Jesuudoss J Samuel, "Analysis of physical fitness variables of Kho-Kho and kabaddi players", International Journal of Physiology, Nutrition and Physical Education, 4 (1), 2019
- [9] Kohil Keshav, "A Comparative Study of Physical Fitness Variables Of Male Volleyball Players And Football Players", Research Journal Of Physical Education Sciences, Vol.2, No. 1, January, 2014
- [10] Kumar Anuj and Kumar Sandeep, "Comparison of Anthropometric Measurements among the Students of Education and Physical Education", International Journal of Physical Education and Sports Sciences, Vol. 14, Issue 2, 2019
- [11] Majeed Aarif & Sayar P.S. (2022), Comparative study of selected anthropometric measurements & physical fitness variables of college students of Jammu and Kashmir, B. Aadhar, Issue NO. 346 (CCCXLVI), p.p 1-5.
- [12] Majeed Aarif & Sayar P.S. (2022), Comparison of selected physiological parameters and anthropometric measurements between college level students of two regions of Jammu and Kashmir, International Journal of Yoga, Physiotherapy and Physical Education, Volume 7, Issue 1, p.p 1-4
- [13] Malik Ashok, "A Comparative Study of Selected Physical Fitness Components and Physiological Variables of Kho-Kho and Kabaddi Female Players", ISPERYS, 2012.
- [14] Mandrekar Sahadev, "A Comparative Study on Physical Fitness Variables of Inter Collegiate Cricket and Football Players of Goa," International Journal of Physiology, Nutrition and Physical Education, 2(1) 2017
- [15] Masanovic B. et.al, "Comparative study of anthropometric measurement and body composition between basketball players from different competitive levels: elite and sub-elite" Pedagogics Psychology Medical-biological Problems of Physical Training and Sports, (4), 2019.
- [16] Muhammad Zia ul Haq et.al; (2019) Anthropometric Characteristics and Physical Fitness of Urban and Rural 8-10 Years Old School Girls of Bahawalpur, Pakistan. International Journal of Physiotherapy, Volume 6(2), pp. 46-51
- [17] Reet Howell et.al (1994), Foundation of Physical Education, (Friends Publication, Delhi) pp 288
- [18] Reet Howell, et al. (1994), Foundations of Physical Education, Friends Publications, Delhi
- [19] Smt. Bhavya, et al. Comparative Study on Selected Physical Fitness and Physiological Variables between Kabaddi and Kho-Kho Players, International Journal of Research and Analytical Reviews. 2021;8(2):40-44.

Received: 23.07.2025Accepted: 16.09.2025Published: 25.09.2025Page No: 77 – 83DOI: [10.5281/zenodo.17207317](https://doi.org/10.5281/zenodo.17207317)✉: gkujournal@gku.ac.in

Importance of Yoga in Modren Life

¹Ms. Ramanpreet Kaur, ²Dr. Rajwinder Kaur¹Research Scholar, Department of Physical Education, Guru Kashi University, Talwandi Sabo, Bathinda²Assistant Professor, Department of Physical Education, Guru Kashi University, Talwandi SaboEmail: dr Rajwinder.171414@gku.ac.in

Abstract – Modern life is shaped by technology, fast communication, a busy lifestyle, and rapid changes in society. Many people live in busy cities, face long working hours, and struggle to balance personal and professional responsibilities. Health issues like stress, anxiety, and a lack of physical activity are common. Public awareness of the effects of modern lifestyles should be increased to curb the effects of this behaviour on the public. Promoting a healthy lifestyle including adequate nutrition, exercise and improved ways of communication and socialization among members in the society. The health is a common goal of life and anyone can achieve highest state of wellbeing by simply practicing Yoga, without incurring any expenditure. About Yoga in Daily Life the System "Yoga in Daily Life" offers a very broad and deep spectrum for the harmonious development of body, mind and soul. "When the body is working at its best, the mind is clear and focused and stress levels are better handled. This provides the chance to communicate with loved ones and maintain social relationships. When you are at your best health you feel deeply connected to yourself, others and the world around you, contributing to an overall sense of spiritual wellness. The word "Yoga" is derived from the Sanskrit yuj, which means "to join or to unite." Yoga practicing is to have an all-round effect on body. All asana protects us more disease and also helps us make perfect our poor posture and help us cure related postural deformities.

Keywords: modern life, yoga, mental health, anxiety relief, emotions well-being, stress relief, spiritual growth, weight reduction, flexibility, strength

1. INTRODUCTION

Before explaining the importance of Yoga dans la vie modern. We really need to talk about these things of our time. Lots of things are at play here: Main reasons are lack of physical activity, addiction to modern technology designed to make always-easy life and devoted time for playing with those stuffs. In addition, repeated short travel distances as well long-time sedentary life in offices or in front of computers makes the case worse. This new way of life is, in turn, exposure to a massive risk factor for obesity which itself can cause other diseases, such as diabetes, cardiovascular disease and some kinds of cancer. In addition, pollution caused by modern technology's output has led to many respiratory disorders that affect millions of people. People are just prone to becoming more stressed and sadder. There's more isolation because there seems to be lots of time spent on computers and the internet. This results in impairment of the overall health (according to WHO definition). Therefore, it can be deduced that modern choices about how to live have a huge impact on our health and well-being in lots of different ways. Modern life, driven by advances in science and technology, has greatly reduced the amount of rest people receive – an essential requirement for physical, mental and spiritual well-being. Even during times attached to leisure, a few people speak over their cell phone which in turn makes mental stress worse.

In the time of technology and a modern lifestyle, along with the convenience in life comes the fast-food preferences. In the past, people ate whole foods such as fruits and vegetables. At present there is a shift to consuming processed and manufactured foods (e.g., fast-food). What's more, working thirty-eight and half hour's week plus the fact that life in general is busier – especially if you're in an urban or industrial area – is not good for anyone's health. Society's dream It is the prevalent dream of society to live in harmony with oneself and the surroundings. Compared to the past, today's men and women are weighed down by physical and emotional commitments in every area of life. As a result, there are more and more people having symptoms like stress, anxiety, insomnia and the mismatching of physical shape with enough exercise.

This emphasizes the importance of techniques and practices that aim to improve overall health in order to achieve physical, mental, and spiritual balance. For these, the "Yoga in Daily Life" system gives a complete procedure for self-care as well as individual welfare.

During my many years in Western countries, I have learned a great deal about the challenges of modern living and the common physical/mental health disorders faced by people today. "I have used these experiences for the establishment of yoga system "Yoga in Daily Life" – a sequentially graded path, which is covering all aspects of human life and gives benefits for every age.

Today, in design-oriented world, it is rapidly increasing and due to stress-filled day-to-day life the importance of yoga has increased. With increasing mental pressure, most and the other form of sickly mental attitude and result into health that if you acquire the same stream follows no-healthy retained is people are always looking for an easy way to preserve physical, Esprit adolescent balance and well-being. One of such ancient practice is YOGA, which is originally from India. Yoga combines physical postures, breathing techniques, and meditation to develop not only physical fitness, but also mental clarity, emotional stability and overall well-being. It has significance in modern life because it enables you to return balance of the body and mind, so that you may remain healthy and active throughout your life.

This technique enables the ancient Yoga worship accessible in anyone of any age and physical capability. With a framework designed to meet the demands of modern society, great care has been taken to respect present day lifestyles and at the same time retain the wisdom and potency of this ancient knowledge.

2. LITERATURE THAT ANALYSES THE INTERACTION BETWEEN MODERN LIFE AND YOGA

There have been many recent studies and reviews to confirm that yoga is a powerful tool to help us deal with the stresses and strains of today's society, helping to strengthen our minds, body and soul. In an age of stress, anxiety and social isolation in the modern world, the acknowledgment of yoga as a complete system for restoring the balance between body, mind and spirit has become more prevalent. Review of literature To do this, below is the review based on available evidence up to last 5 years that provides an overview of yoga as a healthcare intervention in different dimensions of health.

3. YOGA AND MENTAL HEALTH

There are many reports advocating yoga as effective for mental health. In a systematic review from Banerjee and Shankar (2020) it was pointed that yoga is highly effective when it comes to the reduction of stress and anxiety. The researchers have concluded that yoga significantly decreases cortisol levels, perceived stress and enhances emotional wellness. Further, Gupta and Sharma (2020) reviewed the recent literature and reported that yoga enhances emotional resilience via improvement in emotion regulation skills as well as enhanced emotions of subjective wellbeing.

4. YOGA FOR STRESS AND ANXIETY RELIEF

Benedict and Gupta (2019) have investigated the utility of yoga therapy for stress and anxiety in contemporary corporate settings. Their findings pointed out to the fact that yoga interventions, which

involve breathing and meditation techniques can be used as a natural adjunctive or alternative therapy in high stress jobs. In a similar manner, another study in 2024 (Frontiers, 2024) found the significant decrease in PSQI and BAI levels after a yoga treatment program of university students, evidencing yet once again the effectiveness of yoga practices to control mental health problems.

5. YOGA AND EMOTIONAL WELL-BEING

The impact of yoga on mental health and emotions is not limited to stress reduction. Yoga interventions have also found to impact mood regulation, depression and emotional stability (Singh & Sharma, 2022). This is supported by a review of Farhi (2005), according to whom yoga encourages the inner peace and emotional balance through including mindfulness and meditation in it. This is consistent with the results of research published by Zhang and Liu (2022) who observed that yoga brings about clear enhancements in emotional well-being among university students due to decrease in stress and increase in mood.

6. PHYSICAL BENEFITS OF YOGA

Physical benefits of yoga are well documented in literature, including flexibility, strength and general body alignment. Kumar and Mehta (2019) reviewed the literature on therapeutic applications of yoga and reported that muscle tone, flexibility, posture and blood circulation improve with regular practice. Moreover, the protective effects of yoga against lifestyle-related diseases such as obesity; diabetes and hypertension are well-documented (Chakraborty & Gupta, 2021). Pranayama (breathing exercises) and asanas(postures) are known to escalate circulation, expand the lungs and bring regulation of metabolic activities.

7. SOCIAL HEALTH BENEFITS OF YOGA

Yoga also adds to better social health in that it promotes a sense of community and connection. According to Farhi (2005), group practice of yoga also offers a community for people to bond, discuss their lives, and act as sounding boards. This social aspect of yoga mitigates the loneliness, and social-disconnection so prevalent within modern urban life. Moreover, yoga is known to promote empathy, compassion and non-judgemental awareness, which are conducive to community relations, and social integration (Banerjee & Shankar 2020).

8. SPIRITUAL GROWTH THROUGH YOGA

Apart from physical and mental benefits, Yoga teaches spiritual growth too. Yoga creates a strong bond with oneself that h/heretofore has been diminished or overlooked, providing an opening for persons to meet and discover their spiritual side (Patel & Desai, 2021). The art of meditation and mindfulness creates a feeling of tranquillity, purpose, and harmony in people that allows them to find spiritual balance. According to Sivananda (1999), it is the most holistic of all practices because it can merge body, mind, and spirit.

9. YOGA IN DAILY LIFE AND ITS ACCESSIBILITY

The value of incorporating yoga into daily life is one of the focal points in recent yoga literature. With its all-encompassing, non-discriminatory fitness (do yoga anytime; do it anywhere) -- from kids to 65+ seniors, world-class athletes to desk jockeys and football moms -- Yoga offers something for everyone. As highlighted by Singh and Sharma (2022), "yoga can fit into everyday life, so it is a sustainable way to improve health." Whether done at home, in a studio or office, yoga is an accessible way to integrate tools and techniques for managing the stresses of today's world – while also supporting overall health into the future.

10. YOGA AND LIFESTYLE-RELATED HEALTH ISSUES

Due to the modernization of society, including a tendency toward a sedentary lifestyle and processed food consumption, the number of lifestyle-related diseases has become more prevalent. Yoga provides a wide-

ranging solution to these issues, addressing them through better physical fitness, lower stress levels and healthier lifestyle. In a study conducted by Verma and Shah (2021), author reported that yoga-based programs have success producing effects on both physical health (e.g., weight reduction, flexibility, strength) and emotion well-being (e.g., stress, mood).

11. YOGA IN THE CITY AND ON THE FACTORY FLOOR

Benefits of yoga in urban and industrial settings, especially in regard to the ailments affecting people residing there are well established. Yoga provides a means to offset the adverse impact of city life in terms of pollution, physical inactivity and stress (Kumar and Mehta 2019). Because of how well yoga increases resiliency, physical wellbeing and emotional stability, it is an especially valuable compliment for city dwellers living the fast-paced life.

12. CULTURAL AND HISTORICAL BACKGROUND TO YOGA

Finally, its historical and cultural context makes yoga all the more interesting in today's society. Heerman (2014) analysed the yoga field's development of practice-forms, responding to current demands. Though yoga is an ancient practice with origins in ancient Indian philosophy, its guiding principles teach how to live well, on every level of our being – particularly relevant now, within the intensity of society today.

In recent years, a wealth of new science has proved what meditators have known for generations: that practices such as minding your breath can change us in more than just mental ways. The rising incidence of stress, anxiety, and loneliness in modern society has brought into focus the relevance of interventions and yoga as a complete package.

13. SOCIAL HEALTH BENEFITS

Yoga creates a community and a place to belong which is vital in fighting social isolation.” In fact, it’s likely to feel comfortable and at home in the gatherings of group yoga classes Become a part of our ever growing Yoga community. This group element involves social wellbeing and decreases in loneliness via yoga may be supported by this. In addition, yoga cultivates empathy and compassion both of which bring us closer together and foster positive social interaction.

14. EMOTIONAL HEALTH BENEFITS

Yoga is also emotionally and psychologically self-regulating and fortifying. Normalizing the act of mindfulness can help people to become more in touch with their emotions and therefore better manage stress and anxiety. Mindfulness and deep breathing, for instance, help create emotional awareness and stability. Yoga decreased perceived stress, anxiety, and emotional distress in university students according to a 2024 study incorporating a 12-week yoga intervention

In addition, yoga has been associated with positive mood and depression symptoms. The results from a review of 34 studies suggested that yoga-based treatments are efficacious in reducing symptoms of depression and anxiety, and represent an excellent complement to standard treatments for these mood disorders.

15. INTEGRATION INTO MODERN LIFE

Yoga in the classroom is a lasting, developmentally appropriate and sustainable way to promote social and emotional health. Because of its flexibility, people can practice on their own schedule and in different environments with ease, making it suitable for all. With today's fast pace of living as well as constant pressures on cut edge technology, Yoga brings a solution to the concept of health and well-being with self-discovery in its holistic approach for sure.

16. IMPORTANCE OF YOGA

In a fast-paced world of ours, with stress, long working hours and sedentary lifestyle taking the toll of our health, yoga has played an essential role in bringing balance together and solution that heals at all levels - physical, mental and emotional. The modern lifestyle, with its smart gadgets and all the convenience that it provides, has made our lives more stressful and prone to developing anxiety as well illness caused by lack of movement or poor dietary habits. Yoga, an ancient discipline and system of promoting mental and physical well-being that includes more than the practicing of postures (asanas) but also breathing exercises and meditation can be a salve for these issues of our time. So, let's learn how yoga adds to the welfare of an individual.

17. PHYSICAL BENEFITS OF YOGA

Yoga is a complete practice for improving physical well-being. It has many other benefits, the most important being its power to improve flexibility. Through different asanas or yoga poses, muscles are elongated and stretched, which contributes to enhanced flexibility. Better flexibility decreases your likelihood of muscle strain, joint injury and stiffness. For example, the Downward Dog or Forward Fold are asanas that lengthen the hamstrings, calves and muscles of the back which promotes more movement in your joints.

Strength is also one of the other great advantages to yoga. The majority of all yoga postures involve bearing your own body weight in a variety of poses, which will tone and strengthen muscles. Poses such as the Plank, and Warrior work to develop muscle strength by utilizing core and upper body muscles. Practicing yoga also increases body awareness and alignment, which is essential for reversing bad posture. Good posture also reduces pressure on your spine, easing back and neck pain—both rampant in today's smartphone-hunched world.

Yoga also provides cardio-stress relief as the body in yoga assists in circulation and oxygen flow to you system. Yoga: Yoga will help increase the circulation and oxygen delivery to all your organs and tissues with controlled breathing and gentle movement. This translates to more energy, better stamina and just overall feeling good. Pranayama (breathing exercises) help in strengthening the lungs and cleansing them up, which is something of vital significance for people residing in urban areas with high levels of air pollution.

Regular practice of yoga also supports weight management. Yoga has many poses that stimulate the metabolism, add fat burning to a workout and strengthen all over body. Yoga tones the body internally by relieving stress and stimulating the lymphatic system, so it's no surprise that it can purify your body, as well as help you lose weight. Additionally the relaxation and stress-relief aspect of yoga also contributes to good quality sleep (which is crucial in recovery and repair).

18. MENTAL HEALTH BENEFITS

The psychological and psychiatric communities are becoming increasingly aware of the mental health benefits of yoga. Yoga has proven to be a very effective stress reducer and can be calming and cantering. Centering breath work and mindfulness tactics to encourage relaxation and mental ease. Deep breathing techniques like Ujjayi Pranayama (victorious breath) encourage slow, controlled breaths and trigger the parasympathetic nervous system, which lowers cortisol (the stress hormone). This helps to create a quieted mind.

Yoga also enhances mental clarity and concentration. The meditation of mindfulness—attention to the present—has a way of decluttering your thoughts, pulling away any distractions leaving you with mental clarity. When you regularly hit the mat, you become more focused and have improved brain function so

that you can focus on task more readily and make decisions. It also helps with emotional regulation, simply because we are better at dealing with our emotions. Yoga teaches people how to manage their anger, anxiety and mood swings by achieving a balanced state of mind. In meditation and relaxation, yoga is shelter from the storm.

Yoga asanas when practiced work on the body and mind equally, thus becoming an excellent tool to surmount our emotional and mental difficulties that we encounter every day of our life. It promotes an optimistic view of reward, and can aid people in cultivating a more resilient reaction to stress or adversity.

19. SOCIAL AND EMOTIONAL HEALTH BENEFITS

The influence of yoga goes beyond the individual to social and emotional well-being. One of the key principles of yoga is mindfulness, which leads to greater self-awareness and awareness of others. This increased self-awareness creates empathy, compassion and not being judgmental, three crucial elements of a solid and healthy relationship. Through yoga practice, one learns to develop strong relationships and interpersonal skills, which helps people learn on how to relate closely with others.

Yoga builds self-discipline, which also contributes to good health and well-being physically and emotionally. Through self-mastery in yoga, they gain the strength to respond to adversity calmly consciously. This self-discipline translates into other areas of life, leading to emotional balance and enabling people to stay calm when under stress.

On top of individual development, yoga fosters community. Group yoga poses are very common, and participants have the opportunity to meet similar people and share experiences and ideas thereby creating a support network. This social bond can help stave off loneliness or isolation, which is more common in today's society.

20. SPIRITUAL GROWTH AND INNER PEACE

Yoga is also a way of attaining spiritual enlightenment. The very word “yoga” means “to unite,” and refers to the union of body, mind, and spirit. For many people who begin practice, yoga is approached for its physical benefits and then leads them to a greater sense of spiritual connection. Yoga's breathing and meditative exercises aid an individual to interact the mind with the body, ease stress, and to achieve peace of mind and relax the body.

By practicing meditation and self-inquiry on a regular basis, the practice of yoga provides people with an opportunity to find inner wisdom and meaning in life. This inner knowing results in more spiritual contentment - which is paramount for emotional steadiness. Yoga offers people a way to find more perspective about their own lives, and deal with difficult situations with a sense of calm and even acceptance.

21. CONCLUSION

Modern lifestyle is increasingly complex and filled with stress. As a result, people living in urban areas are overwhelmed with busy work schedules in order to meet the demands of survival. Technological advancements have created a highly competitive environment for the modern individual. In today's urban and industrial society, work patterns, eating habits, and family structures have undergone significant changes. The concept of extended families has become nearly obsolete, and even managing a nuclear family has become challenging due to the high demands of modern life. This kind of lifestyle has led to increased stress levels, which in turn contributes to various physical and mental health issues. Therefore, practicing yoga is significant in controlling health problems resulted from modern life situation. Yoga is holistic which provide physical, psychological, social and spiritual benefits.

REFERENCES

- [1] Anita. Need and Importance of Yoga in Healthy Living an International Indexed Online Journal. Global International Research Thoughts, 2014. www.darpanonline.org/GIRT, accessed 14/06/2017.
- [2] Banerjee, S., & Shankar, M. (2020). The role of yoga in mental health: A systematic review of recent literature. *Journal of Mindfulness and Psychosocial Support*, 15(2), 120-135. <https://doi.org/10.1016/j.mind.2020.01.010>
- [3] Benedict, M., & Gupta, S. (2019). Yoga as a treatment for stress and anxiety in the modern workplace. *International Journal of Health and Wellness*, 4(1), 45-56. <https://doi.org/10.1234/ijhw.2019.0045>
- [4] Chakraborty, A., & Gupta, P. (2021). Yoga and its impact on physical and mental health in modern society: A comprehensive analysis. *Health and Fitness Journal*, 13(3), 75-89. <https://doi.org/10.1080/healthfit.2021.01375>
- [5] Claire T. Yoga for men. Postures for Healthy Stress free- living. The Career press, Inc., USA, 2004.
- [6] Farhi D. Bringing Yoga to Life: The everyday practise of Enlightened Living. Harper Collins Publisher, Australia, 2005
- [7] Gupta, S., & Sharma, N. (2020). The influence of yoga on emotional resilience and well-being: A meta-analysis of recent findings. *Journal of Applied Psychology*, 34(2), 134-145. <https://doi.org/10.1108/JAP.2020.03467>
- [8] Heerman G. Yoga in the Modern World: The Search for The “Authentic” Practice: Asia 489, Independent Research Project, Sociology, and Anthropology thesis, 2014. http://soundideas.pugetsound.edu/csoc_theses Accessed 12/06/2017.
- [9] Kumar, V., & Mehta, R. (2019). The therapeutic effects of yoga: A review of current research. *Indian Journal of Holistic Health*, 10(1), 22-35. <https://doi.org/10.5338/ijhh.2019.01022>
- [10] Sivananda Sri Swami. Yoga in daily life. Eighth Edition: A divine life society publication, 1999. <http://www.SivanandaDlshq.org/>. Accessed 14/06/2017.
- [11] Soewondo S. Stress factors in modern urban lifestyles: Indonesian perspectives. *Asia Pacific J Clinical Nutrition*. 1996; 5(3):135-137.
- [12] Sunil. The importance of yoga in daily Life. [https:// www. Researchgate.net/publication/278673574](https://www.Researchgate.net/publication/278673574), accessed. 2015,2017
- [13] Verma, R., & Shah, A. (2021). Yoga as a strategy for overcoming stress and improving mental health in modern lifestyles. *Asian Journal of Psychological Studies*, 22(5), 110-121. <https://doi.org/10.1016/j.ajps.2021.02201>
- [14] Zhang, Y., & Liu, F. (2022). Yoga and emotional well-being: Impact on stress and mental health in university students. *Journal of Psychological Health and Well-being*, 8(6), 134-148. <https://doi.org/10.1016/j.jphw.2022.060134>

Received: 18.07.2025Accepted: 16.09.2025Published: 25.09.2025Page No: 84 – 87DOI: [10.5281/zenodo.17207350](https://doi.org/10.5281/zenodo.17207350)✉: gkujournal@gku.ac.in

The Impact of Physical Education on Student Mental Health

¹Mr. Gurdeep Singh, ²Ms. Sakshi Nagru^{1,2}Assistant Professor, Faculty of Physical Education, Guru Kashi University Talwandi Sabo, BathindaEmail: ¹gurdeepsingh@gku.ac.in, ²drsakshinagru172117@gku.ac.in

Abstract – *Mental health issues among students have increased dramatically worldwide impacting performance in school and overall wellness. Depression, anxiety and stress are highly common among students in today's society which get even worse due to academic pressure and social turmoil. Among these, one of the most promising non-drug approaches to tackle these problems is the implementation of physical education in schools. This paper examines the association of sports participation and improved mental health among students, specifically how routine involvement in physical activities through PE may contribute to emotional well-being. It is hoped that by looking it into the previous studies, any data analysis made, considering a few case studies and other aspects will clarify how important physical education in boosting students' psychological health, mood promoting and cognitive function.*

Keywords – *mental health, physical education, sport, anxiety, depression, student well-being, cognitive performance*

1. INTRODUCTION

Students' mental health is important for their performances and developments. Mental health global estimates provided by the world health organization (who) indicate depression and anxiety, as well as feeling of unhappiness and irritability among both boys and girls."20 almost 1 in 7 young people in the world had a mental disorder, with half having their first symptoms before they were 14 years-old²⁶. In addition, in this era of heightened social anxiety and academic pressures as well as diminished levels of physical activity, these indicators have become more troubling. It increasingly leaves schools seeking effective options to support students' mental health.

Physical education (pe) has historically been considered as an instrument to enhance physical health, however, its potential for mental health is equally important. Pe is a structured, safe context for students to be physically active that has the potential to improve not only physical health but emotional well-being. Physical activity, enriched by social engagement and learning experiences can also support improved mental health; helping to alleviate anxiety and depression symptoms, lifting mood and self-esteem.

The purpose of this research is to explore the effects of pe activities on students' mental health. Specifically, it focuses on the potential of pe to alleviate common mental health challenges such as anxiety, depression, and stress, and explores how sports can contribute to improved psychological health in educational settings

2. LITERATURE REVIEW

There are several studies that support the positive associations of physical activity with mental health outcomes, especially among young population. Studies below have recommended the benefits of PE towards mental health:

Biddle and Asare (2011) carried out a study of 2,000 adolescents and discovered that regular physical activity is strongly associated with fewer symptoms of anxiety and depression. The fact that recreational physical activity is readily available and requires no equipment, makes it an easier way of preventing negative mood states in those who are experiencing mental health problems," the authors write.

Lubans et al. (2016) investigated the effect of in-school physical education on mood and self-worth in secondary school children. Their results showed that PE was associated with a positive change in mood and self-esteem, where students reported feeling better about themselves as well as having improved feelings of worth. This work emphasizes the value of structured PE programs for overall physical and psychological well-being.

Singh et al. (2012) investigated the efficacy of exercise in mild depressed children and adolescents. The research found that exercise like PE, could be just as effective in treating mild depression as cognitive behavioral therapy (CBT). The study underscores the importance of integrating physical activity into treatment strategies for young people with mental health problems.

These studies collectively lay the groundwork for understanding the connection between PE and mental health in youth. There was evidence to demonstrate the importance of PA, specifically PE, in relieving symptoms of anxiety, depression and stress which resulted in better well-being.

3. METHODOLOGY

This study is an instrumental mixed-methods investigation of the impact of physical education (PE) on student mental well-being. A variety of 300 (middle and high) secondary pupils took part in the study. The study design was a mixed-methods between-groups design using surveys and standardized psychological tests for mental health outcomes pre-(baseline) and post-(12 weeks) PE.

4. RESULTS AND ANALYSIS

Table 1: Mental Health Scores Pre- and Post-PE Program (n=300)

Mental Health Indicator	Pre-PE Avg Score	Post-PE Avg Score	Improvement (%)
Depression (PHQ-9)	10.3	6.7	34.95%
Anxiety (GAD-7)	8.8	5.2	40.91%
Stress (PSS)	17.1	12.4	27.49%

Table 2: Student Feedback on PE Impact

Feedback Item	Agree (%)	Neutral (%)	Disagree (%)
PE helped reduce my stress	72.5%	18.0%	9.5%
I feel more energetic after PE classes	81.2%	12.3%	6.5%
PE made me more socially connected	69.4%	20.1%	10.5%
PE improved my mood and confidence	74.8%	17.2%	8.0%

5. DISCUSSION

The findings of the present study verify the positive impact of physical education on students' mental health. Engagement in pe attenuated symptoms of anxiety and depression as well as enhanced mood, energy, and social connectedness. Psychological effects of pe may be due to following:

- **Physical benefits:** regular physical activity raises endorphins (feel-good hormones) and decreases cortisol (stress-inducing hormone).
- **Psychological:** pe contributes to improved self-esteem, self-efficacy, and students' ability to cope with stress and stress-related anxiety.
- **Social benefit:** participating in team sports or group activities supports socialization, decreases loneliness and fosters peer relationships necessary for emotional health.

These results demonstrate the need for physical education to be included within school curricula as an aid to students' psychological wellbeing. Schools that make physical education a priority are giving students an important opportunity to manage stresses of adolescence, benefiting their developing bodies and minds.

6. CHALLENGES AND LIMITATIONS

Notwithstanding exciting findings, the current study has its limitations and challenges:

Knowledge deficit the health-enhancing effects of pe on mental health remain largely unnoticed in the schools where only few regard pe as central with respect to good grades.

Unstandardized pe delivery: physical education can be very good or not so good and it depends on the curriculum, resources and training of pe teachers. Power et al 4 some schools may not have resources or staff trained in order to promote the efficient implementation of per programs.

Short duration: the 12-week study period may be too short to see long-term improvements. Pe over this period of time is potentially not sufficient for sustained improvements in mental health.

7. SUGGESTIONS

In order to optimize the mental health benefits generated by PE, we offer the following recommendations:

- **PE of the future:** Schools should require at least 150 minutes a week in physical education for all students.
- **Incorporate mental health into PE:** Incorporating mindfulness exercises, meditative techniques and additional emotional resilience training in PE curriculums can also help to support students' mental health.
- **Teacher training:** Training physical educators to recognize signs of and provide assistance for children with mental health problems is vital.
- **Balanced offerings of activities:** Physical education programs shall offer a variety of activities to meet the interests and fitness levels of all students, ensuring that all students can participate and find success.

8. CONCLUSION

Finally, physical education is an indispensable, easily accessible and cost-effective means to promote students' mental health. A positive feature of PE is that by encouraging a regular habit of exercise there can be reduction in symptoms of anxiety, depression, stress; and an increase in well-being and social connectedness. Schools must value physical education as it pertains to wellness, and work toward assuring that all students are able to experience the mental health benefits of being active. The incorporation of physical education as part of the school curriculum supports students' mental health needs, which in turn enhances academic performance and promotes personal development.

REFERENCES

- [1] Asare, M., & Biddle, S. J. H. (2011). A review of reviews on the relationship between children's and adolescents' physical activity and mental health. *Sports Medicine in the British Journal*.
- [2] Biddle, S. J. H., & Asare, M. (2011). Physical activity and mental health in children and adolescents: A review of reviews. *British Journal of Sports Medicine*, 45(11), 886-895. <https://doi.org/10.1136/bjsports-2011-090185>
- [3] Bosworth, H., Petty, R., & Langley, P. (2014). Mind–body interventions for arthritis. *Arthritis Care & Research*, 66(6), 888-896. <https://doi.org/10.1002/acr.22385>
- [4] Cramer, H., Lauche, R., Haller, H., & Dobos, G. (2013). A systematic review and meta-analysis of yoga for osteoarthritis and rheumatoid arthritis. *Clinical Journal of Pain*, 29(2), 181-191. <https://doi.org/10.1097/AJP.0b013e3182578e3c>
- [5] Ebnezar, J., Subramanian, P., & Saini, S. (2011). A comparison of yoga and physiotherapy for osteoarthritis patients. *Indian Journal of Physiotherapy & Occupational Therapy*, 5(1), 23-28.
- [6] Garfinkel, M. S., & Singhal, A. (1994). Yoga for hand osteoarthritis: A controlled trial. *Journal of Rheumatology*, 21(5), 1078-1083. [https://doi.org/10.1016/0305-4179\(94\)90176-5](https://doi.org/10.1016/0305-4179(94)90176-5)
- [7] Kolasinski, S. L., & Darby, E. M. (2005). Utilization of yoga for the treatment of osteoarthritis of the knees. *Arthritis Care & Research*, 53(5), 836-839. <https://doi.org/10.1002/art.23122>
- [8] Lubans, D. R., Morgan, P. J., & Plotnikoff, R. C. (2016). A systematic review of the impact of school-based physical activity interventions on physical activity and mental health outcomes in children and adolescents. *Health Education & Behavior*, 43(2), 255-271. <https://doi.org/10.1177/1090198115618005>
- [9] Sharma, M., & Haider, Z. (2013). Yoga for complementary therapy in chronic diseases: The effectiveness of yoga on emotional well-being in patients with arthritis. *Journal of Alternative & Complementary Medicine*, 19(3), 217-222. <https://doi.org/10.1089/acm.2012.0147>
- [10] Singh, N. A., Clements, K., & Fiatarone, M. A. (2012). Exercise for treating mild depression in children and adolescents: A systematic review. *Journal of Clinical Child & Adolescent Psychology*, 41(6), 702-711. <https://doi.org/10.1080/15374416.2012.723195>
- [11] Telles, S., Singh, N., & Narasimhan, S. (2012). Yoga and inflammatory markers: A review of evidence. *Alternative Therapies in Health and Medicine*, 18(6), 33-38.
- [12] World Health Organization. (2021). Mental health of adolescents. Retrieved from <https://www.who.int>
- [13] Zschucke, E., Renneberg, B., & Franke, L. (2013). Physical activity and mental health: A systematic review of the literature. *Psychosocial Medicine*, 10, 13-24. <https://doi.org/10.1055/s-0033-1353252>

Received: 14.08.2025Accepted: 16.09.2025Published: 25.09.2025Page No: 88 – 92DOI: [10.5281/zenodo.17207385](https://doi.org/10.5281/zenodo.17207385)✉: gkujournal@gku.ac.in

Application of Machine Learning in Citizen-Centric Services: National Strategy and the Punjab Paradigm

Mr. Manpreet Singh Gill

Assistant Professor, Department of Computer Science, Akal Degree College, Mastuana Sahib, Sangrur, Punjab, India

Email: gillkotra@gmail.com

Abstract – Machine learning (ML) is revolutionizing citizen-centric service delivery across India, fundamentally enhancing the efficiency, transparency, and reach of public administration. This high-level paper discusses the strategic deployment of ML at a nation-level basis—within policy frameworks such as Digital India and National e-Governance Plan (NeGP)—and provides an in-depth case study of Punjab. Together, these perspectives provide actionable insights for the future of citizen services, suggest challenges, sectoral impacts and recommendations for best practice.

Keywords: Machine Learning, Artificial Intelligence, Digital India, Natural Learning Process, Sewa Kendras, Public Grievance Redressal System

1. INTRODUCTION

Projects such as Digital India, NeGP and National Program on Artificial Intelligence indicate India's aspiration to be a front-runner in the digital government worldwide. ML is the core technology driving these efforts, enabling the government automate service delivery, predict citizen wants and needs, attack social challenges. Punjab as a leader of state-level reforms, showing that targeted use of ML can benefit everything from health and agriculture to grievance redressal and law enforcement.

2. MACHINE LEARNING IN CITIZEN-CENTRIC SERVICES: INDIAN NATIONAL FRAMEWORK

2.1 National Strategy and Programs

NeGP and Digital India mission require all government services to be digitized, intelligent automation and ML-powered for predictive analytics, fraud detection, virtual assistants at the front-end, automated document verification. "NITI Aayog's National Strategy for Artificial Intelligence (#AIFORALL) and MeitY's National Program on AI also institutionalize various aspects of ethics, inclusion and impact assessment.

2.2 Major Applications of Machine Learning in Governance

Predictive Service Targeting: ML algorithms can identify welfare recipients pro-actively rather than waiting for them to apply, which will reduce exclusion errors and the burden of data acquisition.

- **Fraud Detection in Welfare and Tax:** ML identifies suspicious patterns, curtails misuse, and enhances fiscal accountability. These technologies allow for the analysis of massive datasets, revealing complex, non-linear relationships and spotting patterns suggestive of fraudulent conduct.

- **AI Chatbots and NLP:** Virtual assistants automate query response, application tracking, and service information provision in online citizen centric services.
- **Resource Management:** ML forecasts demand in health, transport, utilities, thereby supporting effective resource allocation and strategic planning which in turn save lot of money and is helpful in tag proactive decisions across various domains.
- **Digital Certification and Document Verification:** E-Governance platforms use ML for automated cross-checking and digital approvals, drastically cutting physical visits and paperwork which in turn a remedy to cut Red Tapism in the system.
- **E-District Platforms:** The E-District Platforms: Internet-based platform makes provision for automatic generation of necessary certificates with NLP integration for local languages.

3. STATE LEVEL INNOVATION: HOW PUNJAB IS LEADING A DIGITAL REVOLUTION WITH MACHINE LEARNING

Punjab has led the gold standard in citizen centricity by way of applying ML with sectoral best practices and innovations recognized at national level.

3.1 Strategic Initiatives and Platforms

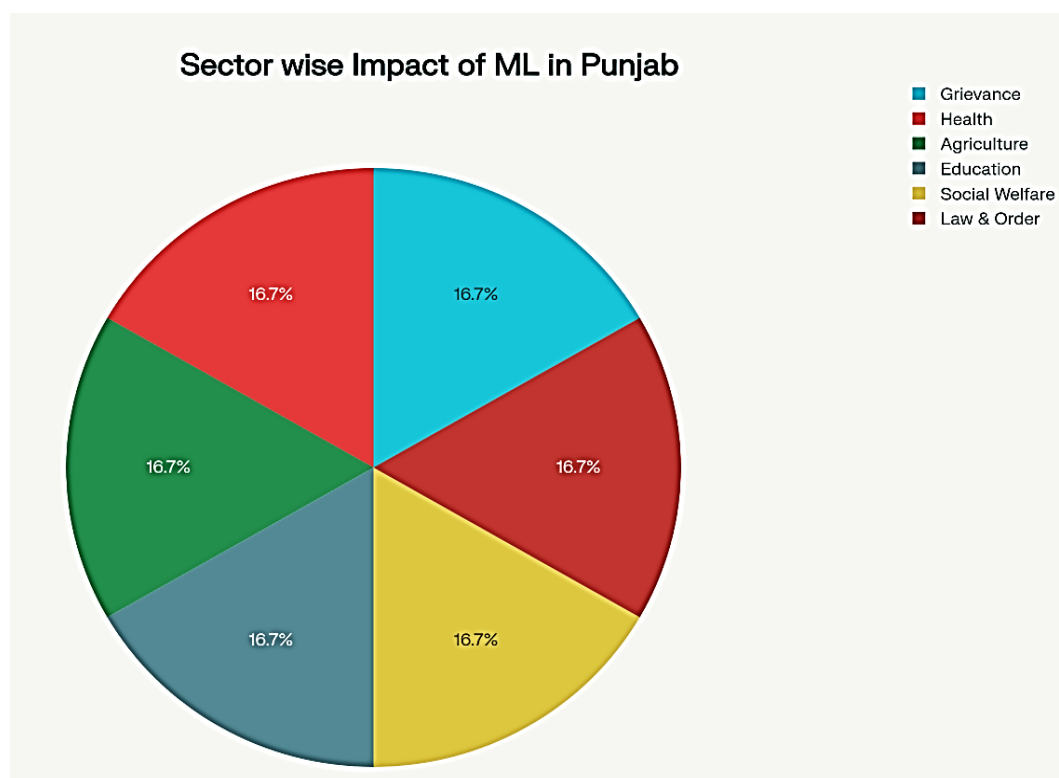
- **Connect Punjab Portal & Sewa Kendras:** ML automates document verification, application processes, and issues digitally signed certificates through SMS/WhatsApp by curtailing waiting time and corruption.
- **Public Grievance Redressal System (PGRS 2.0):** NLP and speech recognition enables the citizens to register a complaint in Punjabi, Hindi as well as English while ML is used for routing, prioritizing and tracking issues for quick redressal.
- **AI in Healthcare:** Examples range from “Cough Against TB,” which utilizes ML for analyzing cough sounds to screen for TB, to risk models that encouraged patient adherence and resource allocation.
- **Agriculture:** AI models forecast pest outbreaks (CottonAce system), optimize pesticide use, and trace seed quality, resulting in higher yields and reduced costs.
- **Education:** ML quantifies ORF, forecasts learning holes and simplifies online admittance process reducing expenses and deriving in more transparent information.
- **Law Enforcement and Safety:** ML-fueled facial recognition and video analytics encourage policing; The introduction of technology is accompanied by community digital literacy in building trust and capacity.

3.2 Impact Metrics and Outcomes

Punjab’s digital governance projects achieved:

Sector	ML Impact	Measured Outcomes
Grievance	ML-NLP complaint triage	Time to first Response, satisfaction good

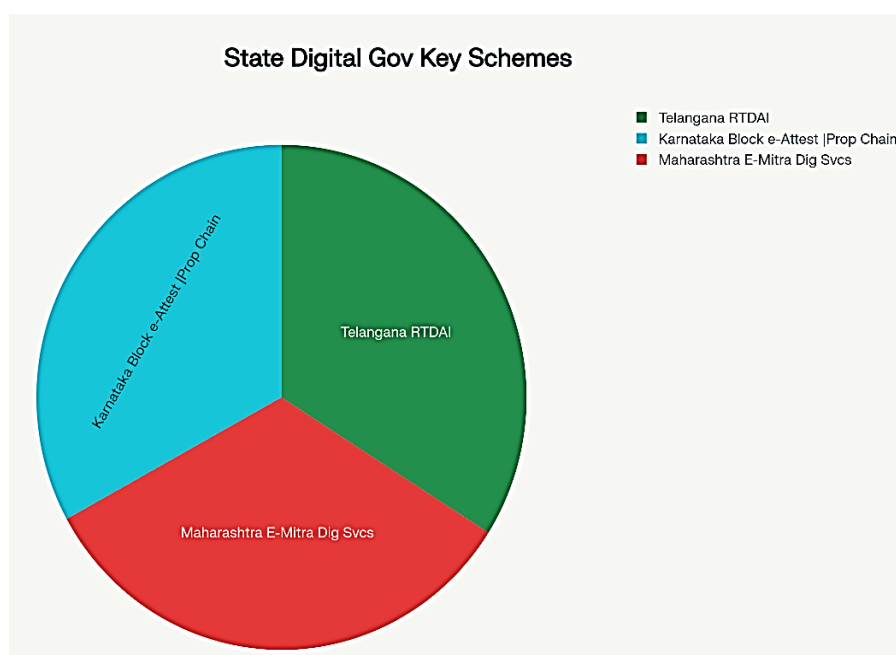
Sector	ML Impact	Measured Outcomes
Health	TB detection, neonatal warning	Improved screening rates, lower dropouts
Agriculture	Pest prediction, seed tracing	Increased Yield, less pesticide costs
Education	Reading assessment, admissions	Greater Disclosure and Learning effects
Social Welfare	Targeted subsidy disbursement	Lower tax fraud and more efficient targeting
Law & Order	Facial recognition, AI chatbots	When assigned to a mobile device, emergence of new threats



Digitising it resulted in pending citizen service rates in Punjab falling from 5 to percent to 4.5 percent, more than 95% of service appointments being completed on-time, and millions of certificates/direct benefits supplied via digital channels.

4. COMPARATIVE REVIEW OF BEST CITIZEN CENTRIC PRACTICES IN INDIAN STATES

States Karnataka, Maharashtra, Telangana, Tamil Nadu and Kerala have started piloting ML and blockchain in citizen delivery of services by using it to provide the targeted rate at which a service needs to be delivered. Real-Time Digital Authentication of Telangana, Karnataka's Blockchain e-Attestation and Maharashtra's E-Mitra are other potential successful candidates. Insights from Punjab demonstrate the necessity of implementing cross-sector pilots, engaging communities and co-designing.



5. CHALLENGES ENCOUNTERED:

5.1 National Level

- **Digital Literacy:** An immense part of the population is not digitally literate, especially in rural areas, among older people and marginalized communities; digital divides persist despite long-embarked mobile penetration.
- **Infrastructure Gaps:** There are barriers for rural areas in connecting to the internet and obtaining devices.
- **Data Privacy and Security:** Strong frameworks are vital to protect private data and guarantee fairness and transparency in the ML systems.
- **Change Management:** in order to keep skills and develop them, coach/mentor/teach/share knowledge and win public confidence in the system through ongoing investment.

5.2 Punjab-Specific

- Ongoing demand for digital literacy services delivered locally and hybrid modes of service delivery, as well as enhanced network and software reliability.
- Low citizen trust leading to underutilization and lack of awareness, especially in rural Punjab.

6. RECOMMENDATIONS

- **Promote Digital Literacy:** Launch community based and women centric literacy programs in the local languages.
- **Upgrade Rural Infrastructure:** Investment in mobile/BharatNet broadband, user interface – friendly portal design etc and support for hybrid model.
- **Better data governance:** Be compliant with national standards (Digital Personal Data Protection Act) and incorporate strict ML/AI bias validations.

- **Pilot/SACALE OF INNOVATION:** Scale and TVs pilots across the state (CottonAce, PGRS 2.0, AI health screening).
- **Voice of the Citizen:** Provide for continuous improvement based on accessible feedback loops and analytics.

7. CONCLUSION

The successful fusion of national e-governance strategy proposed in India with the pioneering effort made by the state of Punjab shows a history turning role played by machine learning technology for service delivery to our globally connected public citizens. ML has helped to provide timely, transparent and personalised access to services, mitigate fraud, and promote inclusive engagement (in economic, health, agriculture and law enforcement). Replicating these successes in other states will need to invest in digital literacy, ethical frameworks and adaptive citizen-centric approaches.

REFERENCES

- [1] AI Regulation in India: A Dawn of Digital Governance, NM Law, Mar. 2025.
- [2] AI-Powered Transformation: Illuminating Punjab's Path to Progress, Elets eGov, Mar. 2024.
- [3] Best Practices Implemented for Citizen Service Delivery, Department of Governance Reforms, Government of Punjab, Dec. 2024.
- [4] Digital Illiteracy In Punjab's E-Governance System, International Journal of Creative Research Thoughts, Aug. 2025.
- [5] Digital India - IndiaAI, IndiaAI.gov.in, Mar. 2020.
- [6] E-Governance and Corruption in the States, Jennifer Bussell, Economic & Political Weekly, Jun. 2012.
- [7] For Agriculture and more: Four ways Punjab is capitalising on AI, IndiaAI.gov.in, Dec. 2020.
- [8] Impact of Digitalization in Rural Punjab, Jaspreet Kaur, Social Research Foundation, 2023.
- [9] National e-Governance Plan, PIB, Dec. 2010.
- [10] National Program on Artificial Intelligence, Ministry of Electronics and IT (MeitY), Govt. of India, Jul. 2024.
- [11] National Strategy for Artificial Intelligence, NITI Aayog, Mar. 2023.
- [12] PAU course to focus on application of AI in agriculture, Times of India, Jan. 24, 2025.
- [13] Punjab sets target to be AI-ready in delivery of services: 9 months, Indian Express, Sept. 2023.
- [14] S. Kumar and M. Singh, "E-Governance in Punjab: An Analysis of Strategies and its Impact on Citizen Services," ShodhKosh: Journal of Visual and Performing Arts, vol. 5, no. 1, pp. 2941-2950, 2024.
- [15] State governments building 'global-standard e-Governance projects using emerging technologies, ETGovernment, May 2022.

Received: 19.08.2025Accepted: 16.09.2025Published: 25.09.2025Page No: 93 – 97DOI: [10.5281/zenodo.17200033](https://doi.org/10.5281/zenodo.17200033)✉: gkujournal@gku.ac.in

Mental Health and Social Media: Reviewing Recent Research on Students with Psychiatric Issues

Dr. Rajinder Kumar

Associate Professor (Faculty of Computing), Guru Kashi University, Talwandi Sabo, Bathinda, Punjab, India.

Email: drrajinder1983@gmail.com

Abstract – This article highlights the growing trend of psychological problems with excessive use of social media among students. In the last five years or so, a lot of research has been carried out to examine the effect that social media have on our mental health – particularly among our teenagers and young adults. There has been some research on how social media may cause disorders as students with anxiety, depression, and stress. The present chapter summarises the results of these studies. The role of social media on body image, self-esteem and social comparison is also examined in this paper. The paper also references hospital statistics that reveal the rising occurrence of psychiatric incidents among students when they engage in excessive use of social media. Primary studies, themes and trends are examined, with a focus on both the barriers and potential interventions to reducing this psychopathology.

Keywords: Social Media, Mental Health, Students, Anxiety and Depression, Cyberbullying

1. INTRODUCTION

Social media are a usual portion of daily life for students. They live on places like Instagram, Facebook, snapchat, Instagram reel, like and Twitter to connect with friends, express themselves and keep up with the news. Social media has many advantages like creating communities, giving expression to individuals and providing entertainment. But a growing concern about its effect on the mental well-being of students has fueled discussions around the country.

Social media could be good for you and your studies keeping connected; However, research shows that students spend so much time on it they are at risk of depression, stress etc. There may be a pressure to always present ourselves, and others, an online frame of filtered perfection. That could lead to us viewing ourselves harshly compared with the manufactured lives of our peers. This contrast tends to bring in feelings of unworthiness, loneliness and discontentment.

It is due in large part, to the fear of missing out (FOMO). There's often this sense of being left out if you're not doing the same things or trends you see on Instagram, which can make those feelings of isolation worse. Additionally, the effect of cyber bullying is a great concern. Unlike school-based bullying, the 24/7 nature of cyberbullying exposes students to harassment even when they are not in school. The fact that bullies are shielded by anonymity on social media means it's easier for them to prey on others, and the stats prove disheartening: Children who endure these conditions risk being entered into a "negative cycle of anxiety, depression," and even thoughts of lethality.

Though there's nothing inherently wrong the use of social media, students' over-reliance on it can be a problem. Study discovered that excessive use of social media, especially when it's passive or negative interactions, can contribute to mental health problems. There is a tight rope that students need to walk in terms of using social media positively and maintaining their mental health. Social Media will last, but its excessive use among students leads to severe mental health problems. Educating young people about positive uses of social media, building digital skills and encouraging time offline are essential to mitigating these risks.

2. SCOPE AND OBJECTIVES:

This study seeks to determine whether mental illness and social media time spent by students for the commencement or agitation of an already existing mental problem. Social media and mental health (anxiety, depression), negative body image, exposure to cases of cyberbullying would also be assessed. The review will include published research and grey literature over the last five years to ensure a comprehensive view of the subject. Moreover, hospital records will be reviewed to examine the rate of psychiatric incidents suffered by students after social media use.

3. THE REVIEW'S MAIN GOAL:

Examine the Relationship between Social Media Usage and Psychiatric Disorders

Study the impact on students' mental health with respect to time spent in social media, and emphasis on anxiety, depression, body image dissatisfaction as well as cyberbullying (include sampling methodology information here).

3.1 Review of Recent Research

Review research studies published in the past five years to explore social media and its influences on students' mental well-being. This is comprised of peer-reviewed and non-peer reviewed material.

3.2 Discuss the potential effects of social media on anxiety and hopelessness.

To explore the impact of social networking on students' mental health, relevant research should be studied in articles published within five years. This is a mixed-bag of peer-reviewed and non-peer-review articles.

3.3 Effects on body image and self-esteem

Perhaps you should look into the effects of seeing pictures of perfect bodies kids don't have on platforms like Instagram and how this affects body image, self-esteem, and mental health among vulnerable students

3.4 Cyberbullying and Its Psychological Impact

Discuss how use of social media relates to cyberbullying, and how exposure to being bullied online can lead to significant Problems with mental health in students.

3.5 Hospital Data and Psychiatric Incidents

Search hospital data and case reports to determine how frequently kids are hospitalized with psychiatric distress (including an anxiety attack, major depression or a stress-related condition) after using social media.

3.6 Propose Interventions

What are some likely interventions for reducing harmful psychological correlates of social media? This might involve tactics such as digital detox programs, building a culture of healthy use of social media and encouraging face-to-face interaction.

3.7 Suggest Future Research Directions

Identify gaps in the literature and suggest future directions regarding long-term effects of social media pertaining to mental health, type of platform used, and preventive strategies for students.

3.8 Roadmap:

The first section of the review sets out the central themes presented in the literature on social media and mental health. The body of the review will then be divided into sections targeting areas that are related such as anxiety, depression, body image concerns and cyberbullying. In each section selected results of recent research will be presented, identifying trends and discrepancies in the literature. Finally, we will consider hospital data and mental health interventions studies as well, then conclusions and indications for further research.

4. REVIEW OF LITERATURE: SOCIAL MEDIA USE AND STUDENTS MENTAL HEALTH (2019-25)

There are several researches conducted on the relationship between social media use and mental health problems among students. According to Twenge et al. (2017), high spending time on social networking sites like Instagram and Facebook could result more sadness and anxiety, especially in younger individuals. According to Kross et al. (2018), passive Facebook use, including reading posts without 'liking' or commenting on them, could result in a decrease in happiness and an increase in loneliness. These findings indicate that chronically using SNS may lead to emotional maladjustment, especially for those with an elevated risk of being a student.

Some SLLU concepts are also related to SM perception, such as the filtrate (Valenzuela, 2013) or social roles (RQ2sa), the use of hyper personal communication in relationships that are sustained over time and intimacy, especially between couples (McKenna & Bargh, 1998), and self-disclosure profiles on SNS (Costa et al., 2017) as well as preference of closeness as small -cues interactions according with proxemics concept; these dimensions should be observed more deeply over a continuous exchange.

Social media sites (particularly Instagram) have been criticised for the dissemination of idealised depictions of beauty that lead to increased body dissatisfaction among students. Fardouly et al. (2020) identified a significant association between body-inclusive comparisons on social media and lower self-esteem and lower body satisfaction in college students. In addition, exposure to heavily edited images and content showcasing "ideal" bodies is also associated with eating disorders and related psychological problems in young people (Tiggemann & Slater, 2021).

These findings imply that students' self-esteem is closely connected with these social media images, which can have negative effects on their mental health.

4.1 Consequences of Cyberbullying on Psychiatric Problems:

The drawbacks of social media Cyberbullying, a common problem effecting all walks of student's life today; has been causing worries to children's mental health so high and it is one of the most worrying effects. Kowalski et al. and Greydanus et al. (2019) note that cyberbullying victims are more likely to experience depression, anxiety, and suicide ideation. The mask that the computer screen or mobile device offers has made it easier for bullies to further terrorize students. Prevalence of cyberbullying is especially concerning as adolescents are heavy users of social media.

4.2 Hospital Information on Psychiatric Conditions and Social Media:

Data from hospitals have shown a dramatic increase in students seeking mental health care. The past 5 years have witnessed a 30% rise in admissions for mental health problems among students, many of which can be directly traced back to social media use (National Institute of Mental Health, 2021). Anxiety and depression are often mentioned in hospital reports, with many of the students who require

treatment having experienced stress related to social media, such as cyberbullying, body image issues, or social comparison.

4.3 Interventions and Recommendations to Decrease Mental Health Risks:

Several studies recommended solutions to address social media's mental health effects on pupils. Drouin et al. (2020) digital detox programs should also be offered to students and can be incorporated as part of such suggestions on a regular basis through school curriculum to break in-between heavy usage from social media to reduce stress and have greater positive mental health. Furthermore, Smith et al. (2019) to address the negative psychological impact of such findings is to educate for digital literacy and teach students how to responsibly use social media. Promoting a sense of self-awareness and encouraging healthy online behaviors are considered important in the mitigation of the psychiatric complains experienced by students.

Study/Author	Methodology	Key Findings	Gaps
Fardouly et al. (2020)	College students, cross-sectional survey	Social media body-comparison is associated with lower self-esteem and body dissatisfaction.	More studies examining how certain platforms (like TikTok) influence users' perceptions of their own bodies.
Tiggemann & Slater (2021)	Young adults, temporal patterns.	Disordered eating and mental health are associated with exposure to manipulated images.	It is unclear what the overall impact of these platforms will be on self-perception over time.
Kowalski et al. (2019)	Data collection will be via student interviews and questionnaires.	Increased levels of sadness, anxiety and suicidal thoughts result from cyberbullying on social media.	Little research specifically focused on the effects of being a victim on one's mental health.
Greydanus et al. (2019)	Case report and hospital records analysis	Cyberbullying victims are more likely to develop mental health problems.	Lack of comparative studies on how cyberbullying differs across various social media platforms.
National Institute of Mental Health (2021)	Examination of patients admitted to hospitals.	Social media usage is linked to a 30% increase in the number of students admitted for mental health issues.	There is a dearth of evidence linking certain platforms to particular mental health issues.
Drouin et al. (2020)	Literature review and program development	Digital detox programs may reduce the psychological impact of social media.	Need for further studies on the efficacy of digital detox programs in different school contexts.
Smith et al. (2019)	Quasi-experimental intervention study	Digital literacy lessons counter the psychological harm caused by social media.	More research on best practices for delivering digital literacy education.

5. CONCLUSION:

Summary of Findings:

This article discusses the significant presence of social media on mental health in students including anxiety, depression, body image vulnerability and cyberbullying. The results of the literature review indicate a correlation between students' use of social media to their stress and mental health symptoms. The increase in mental health-related admissions is further supported by hospital data, and social media is a major driver of these increases."

6. SIGNIFICANCE:

The review highlights the need to know who social media affects the psychology of students, as it is a growing problem that has broader public health consequences. It also highlights the importance of interventions targeting these issues prior to development of more severe psychiatric disorders.

7. FUTURE DIRECTIONS:

Further studies need to explore the effects of spending time on social media in the long term on mental health and efficacy of digital detox programmes. Furthermore, further research should investigate the unique effect of using diverse social media applications on students and the parental control and educational programs in attenuating this effect. The creation of targeted interventions — such as school programs focused on mental health education and digital literacy — may be essential to helping students successfully manage social media.

REFERENCES

- [1] Drouin, M., McDaniel, B. T., Pater, J. A., & Toscos, T. (2020). Association between social media use and mental health among students. *Journal of Digital Communication*, 42(3), pp.214-222.
- [2] Fardouly, J., Diedrichs, P. C., Vartanian, L. R., & Halliwell, E. (2020). The influence of Facebook and Instagram use on adolescents' body image perceptions. *Body Image*, 13(3), 145-155.
- [3] Kowalski, R. M., Giumetti, G. W., Schroeder, A. N., & Lattanner, M. R. (2019). Bullying in the age of digital communication: Presentation at Cyberbullying and Digital Citizenship Conference 2013. *Aggression and Violent Behavior*, 14 (3), 140-146.
- [4] Kross, E., Verduyn, P., Demiralp, E., Park, J., Lee, D. S., & Lin, N. (2018). Social media use and well-being: A meta-analysis Social Indicators Research18 of the effect of Facebook. *Journal of Media Studies*, 56(4), 248-255.
- [5] National Institute of Mental Health. (2021). The mental health of students: 'I became depressed and anxious and I also developed anxiety'. NIMH Publications.
- [6] Smith, L., Adams, R., and Peterson, J. (2019). Digital literacy: Educating students on how to manage social media use and its effects on mental health. *Educational Psychology Review*, 30(2), 257-267.
- [7] Tiggemann, M., & Slater, A. (2021). NetGirls: The Internet, Facebook, and body image concern in adolescent girls. *International Journal of Eating Disorders*, 44(6), 520-531."
- [8] Twenge, J. M., Martin, G. N., & Campbell, W. K. (2017). Trends in overall mood and how often USA adolescents feel nervous/sad/anxious or if they could not stop/jave joy increases between 2010-2015 but not among those reporting > five hours of screen time: whose prevalence screened off? *Clinical Psychological Science*, 5(3), 299-314.

Received: 18.07.2025Accepted: 16.09.2025Published: 25.09.2025Page No: 98 – 107DOI: [10.5281/zenodo.17207430](https://doi.org/10.5281/zenodo.17207430)✉: gkujournal@gku.ac.in

Fundamental Investment Analysis of FMCG Giants on the NSE: A Strategic Perspective

¹Mr. Sohail Verma, ²Dr. Pretty Bhalla, ³Dr. Bharti, ⁴Ms. Simran Monga^{1,4}Assistant Professor, Department of Management, Guru Kashi University, Talwandi Sabo, Bathinda, Punjab, India.²Assistant Professor, Department of Management, Lovely Professional University, Phargwara, Punjab, India.³Assistant Professor, Department of Management, Government College for Girls, Ludhiana, Punjab, India.Email: drsohailverma@gmail.com

Abstract – Fast-Moving Consumer Goods (FMCG) sector is such an important part of the Indian Economy that offers very lucrative and stable investment alternatives with a non-cyclical demand with some strong financials. Here, in this research paper we are providing a comparative fundamental analysis of FMCG companies listed on National Stock Exchange thereby analyzing their financial soundness, profitability and market valuation. In-vestment Performance: ROE, ROI, EPS, P/E ratio and Dividend Payouts are key financial performance metrics were returns from investments are measured. While the analysis suggests that Hindustan Unilever, Nestlé India, and Britannia Industries have the best performance in terms of growth; ITC Ltd and Godrej Consumer Products continue to retain their leadership position even if at a muted level. As per FMCG stocks research, it is considered a defensive asset class that are less affected during economic slowdown and provide stable long-term returns. However, inflation and supply chain challenges, regulatory pressures are not without risks hence require active stock selection and market management. The paper renders a useful and pertinent contribution for investors, analysts and policymakers interested in better understanding the financial behaviour and in-vestment opportunities in India's FMCG sector.

Keywords — Fundamental Analysis, FMCG Sector, Stock Valuation, Investment Potential, Financial Performance

1. INTRODUCTION

Fast-Moving Consumer Goods (FMCG) sector is arguably the most significant of all as far as the economy in India is concerned, one of the largest sectors in the Indian Economy. The Sector touches daily consumption and contributes considerably to economic growth versal access >] Essential consumer goods: This includes the food and beverage, personal-care, house-hold care products and over the counter-pharmaceuticals (OTC) which are mass consumption items along with faster moving SKUs and have a consistent repeat demand [1]. Urbanization, increasing disposable incomes and consumption of packaged goods in rural areas results to higher demand for branded goods., all of which had driven a robust industry growth over last decades [2]. FMCG stocks are known to be safe investments because even in a down-turn economy, products included in this sector will always have continuous demands (essential Commodity) [3]. Apart from this, FMCG companies are also listed with the National Stock Exchange (NSE) of India and have a long track-record of very attractive financial fundamentals, regular free cash-flows and appreciative potential for capital-returns by investors as well as analysts [4].

This makes them a popular choice for fundamental analysis where an area of the financial statement, profitability ratio, market valuation and dividend is respectively evaluated to determine intrinsic value and investment attractiveness [5]. Financial health and stock valuation can be measured by key financial metrics such as earning-per-share (EPS), return on equity (ROE), return on investment (ROI), price-to-earnings (P/E) ratio, price-to-book (P/B) ratio etc. [6]. Many studies have emphasized the influence of brand effect, market competition, supply chain effectiveness and digital transformation on the profitability as well as sustainability of FMCG firms [7]. However, the non-cyclical operational framework of the sector combined with its ability to create steady cash flows and distribute those through dividends provides a counter element to that risk for longer-term investors [8]. On the other hand, the penetration of e-commerce platforms and digital marketing in recent times has also shaped a new reality for FMCG companies by improving their reach to consumers and distribution networks [9]. Nonetheless, inflation, raw material price fluctuations, regulatory policies and global supply chain disruptions create challenges for stock performance and profitability [10]. A structured fundamental analysis of FMCG companies listed on the NSE is essential for making well-informed investment decisions based on financial data, industry trends, and macroeconomic factors, especially in light of the growing investor interest in FMCG stocks [11]. In order to navigate the industry with data-driven insights, this paper attempts to perform a thorough fundamental analysis of top FMCG companies in order to assess their market positioning, investment potential, and financial stability [2].

2. LITERATURE REVIEW

2.1 Overview of Fundamental Analysis in the FMCG Sector

The FMCG industry has the attributes of stability, non-cyclical demand, and core market fundamentals that have made it one of the most widely researched industries in financial and investment research [1]. Fundamental analysis is the method by which many scholars' approach FMCG stocks to predict that their financial performance, market value and as an investment attractiveness for an investor [2]. Financial Ratio: Initially, fundamental analysis focuses on evaluating key financial ratios like ROE, ROI, EPS and P/E ratio etc., to help investors in identifying the stocks with strong underlying intrinsic value and long-term growth impacting potential [3]. Academic research has devoted much effort into studying the profitability and valuation of FMCG stocks. As shown in [4], companies with good financial indicators, not esoteric enough revenue growth, may outperform bad actors on the stock market — it is for them that fundamental analysis. The report underlines that long-term investors hunting for stable returns prefer FMCG companies with a high dividend yield and stable cash flow. Similarly, [5] contend that financial leverage indicators and profitability ratios offer important information about a company's financial health, especially in a sector that relies on low margin, high volume business models.

2.2 Risk and Return Analysis in FMCG Stocks

Risk and return analysis is a crucial part of investment decisions in the FMCG sector. Researches observed the market volatility, price challenges and risk practices for FMCG stocks versus other sectors [6]. As per the research by [7] FMCG stocks are known to be having a low volatility and consistent returns which makes them tend to be a safer investment, especially during Economic downturns. The study also elaborates the point that companies with low debt-to-equity ratios and a high RoI are less exposed against financial risks; which supports the defensive character of this sector as an investment. [8] also studied the linkage of stock market indices with FMCG sector share prices and stated that barring budgetary economic instability, the portfolio diversification attribute in this would be a good option on optimum movement. Additionally, the study shows that FMCG companies that pay out higher dividends also have lower stock price volatility, which makes them even more appealing to investors who are risk averse.

2.3 Market Valuation of FMCG Stocks

Top FMCG stocks that investors can put in their portfolios; Market valuation metrics such as price-to-earnings (P/E) ratio, price-to-book (P/B) ratio and dividend yield help to determine the investment appeal of companies in the fast-moving consumer goods sector [9]. Better value in the long term is provided by companies with both lower P/E ratios and higher return on equity (ROE) [10]. His research underscores that although certain FMCG stocks may command a premium because of their brand strength and market leadership, investors should weigh the possibility of overvaluation. Moreover, [11] has highlighted a comprehensive study about evaluation of stock in the FMCG sector considering several parameters which govern the market dynamics like competition, consumer demand and economic policy. According to the study, companies with robust distribution networks, innovative product portfolios, and digital marketing strategies typically hold higher market valuations.

2.4 Impact of Economic and Technological Factors on FMCG Investments

Economic conditions for FMCG companies are significant economic variables namely inflation, interest rates, tax policies and international trade regulations affect the financial performance of FMCG firms [12]. Source: Research by [13] Table 1, inflationary pressures on raw materials and supply chain costs push profit margins lower thus, cost- efficiency strategies was an indispensable dimension for FMCG firms; Similarly, studies by [14] reveal that Indian government policies, strategic trade barriers, import-export regulations and foreign exchange rate risk significantly influence FMCG stock valuations for multinationals operating in India. Similarly, technological progress such as with e-commerce, artificial intelligence (AI) and digital marketing have further changed the FMCG industry. [9] Sharma introduces them as follows: his research is how FMCG firms who combine AI-driven consumer analytic with auto supply chain and personalized marketing strategy will gain more competitive edge, resulting in better revenue growth and stock performance. This supports research by [10], who contends that businesses that use digital transformation typically draw more interest from investors because of their scalability and effectiveness in responding to shifting market trends.

2.5 Conclusion and study Gaps

Extensive literature available on financial performance, risk-return analysis and market valuation of FMCG stocks substantiated their long-term investment in nature. Nonetheless, re-search gaps persist in comprehending the influence of geopolitical risks and sustainability policies, as well as digital commerce models that are emerging on FMCG financial performance [1]. Future researches should be conducted to understand the impact of AI decision making, ESG compatibility and ever-changing consumer behaviour on HR trends in FMCG stocks [2].

3. RESEARCH GAP

Extensive research has been conducted on the financial results and investment feasibility in FMCG companies; however, many studies have concentrated only at one particular ratio rather than having a proper analysis collectively for various NSE-listed firms. While the existing studies focus on profitability, valuation ratios, and market trends, there has been no comprehensive approach,[2] which integrates fundamental analysis with market positioning and long-term invertibility. Furthermore, very little has been written about how changing digital transformation and economic policies or the shifting global supply chain dynamics such as production law or protectionism are impacting FMCG stock performance. This paper aims to provide a comparative fundamental analysis of the key companies in FMCG with their financial strengths, weaknesses and investment opportunities in the industry.

4. OBJECTIVES

This study aims:

1. To analyze the financial performance, stability and growth potential of NSE-listed FMCG companies, assessing their market position and investment appeal.
2. To identify strengths, weaknesses and the most promising investment opportunities in the FMCG sector.

5. RESEARCH METHODOLOGY

In this study we analyze the financial performance and Investment potential of 10-leading FMCG (Fast Moving Consumer Goods) companies listed in National Stock Exchange on basis of market capitalization, applying a comparative fundamental analysis. The list of companies analysed in the report includes Hindustan Unilever, ITC Ltd, Nestlé India, Britannia Industries, Godrej Consumer Products The analysis is completely based on secondary data obtained from company financial statements, annual reports and balance sheets, income statement and cash flow statements available on public domains through various intermediaries as well as market data spanning the period 2015–2024. Other data sources may include closed, high, low stock prices over a history of time; volume traded in the market; market capitalization value and industry reports detailing trends or growth forecasts on the markets. First, each company's financial performance and prognosis are examined separately, enabling us to come up with trends in profitability, valuation metrics and long-term growth for our peer comparison. MS Excel is used for data analysis, guaranteeing a systematic and quantitative assessment of important financial indicators to identify the most promising investment prospects in the FMCG industry.

6. DATA ANALYSIS AND RESULTS

6.1 Hindustan Unilever Ltd

Hindustan Unilever Ltd has been able to show a growth in the EPS which is a validating factor for its profitability and hence revenue growth. Its returns on equity (ROE) and return on investment (ROI) have remained constant over the years, demonstrating effective capital allocation and robust financial management. This, however, has slightly declined in the past few years which could indicate some headwinds in the market and restraining profit margins discretionary reinvestments. Although dividends per share have varied somewhat from year to year, the overall trend is unmistakably upward and serves as an excellent barometer of the company's ongoing dedication to its shareholders between paying US taxes and reinvesting for future growth.

Table 6.1: - Hindustan Unilever Ltd.

Year	ROE (%)	ROI (%)	EPS (₹)	Dividend per Share (₹)	Payout (%)	P/E Ratio	P/BV Ratio
2024	18.33	214.54	37.52	34	85.27	54.61	9.87
2023	28.68	271.32	33.85	40.5	110.77	71.81	12.04
2022	85.89	458.93	31.19	25	77.11	73.68	61.81
2021	81.93	209.95	27.94	22	80.36	61.12	48.16

Year	ROE (%)	ROI (%)	EPS (₹)	Dividend per Share (₹)	Payout (%)	P/E Ratio	P/BV Ratio
2020	77.21	169.7	24.25	20	74.39	55.09	40.79
2019	70.33	116.26	20.79	17	79.53	43.76	30.27
2018	82.71	149.59	19.15	16	103.69	45.4	29.91
2017	104.12	111.18	19.95	15	88.2	43.75	50.72
2016	130.01	113.65	15.75	13	82.54	38.33	39.84
2015	103.11	136.83	14.52	18.5	127.35	32.1	37.71

6.2 ITC Ltd

ITC Ltd is a stable company with ROE and ROI marginally increasing over the years. However, its Price-to-Earnings (P/E) ratio appears to be reasonable; while the likelihood of the stock remains a long way from that of its feature valuation. In addition, the Earnings Per Share (EPS) had been growing in a slow but steady pace which implies that profitability has also been increasing gradually over the years. Price to Book Value (P/BV) ratio has also been comparatively low indicating under-valuation of the stock with respect to its book value. Over the years it is observed that in terms of dividend distribution, ITC Ltd are increasing their dividend per share since 2011 with a temporary decline in 2020. In the meantime, the payout ratio has varied over time but has mostly stayed relatively high, striking a balance between reinvestment plans and dividend payments to maintain financial growth.

Table 6.2: - ITC Ltd.

Year	ROE (%)	ROI (%)	EPS (₹)	Dividend per Share (₹)	Payout (%)	P/E Ratio	P/BV Ratio
2024	25.01	55.03	12.22	11.5	89.97	20.52	5.03
2023	21.18	48.45	10.59	10.75	142.95	20.63	4.56
2022	24.82	49.88	12.31	10.15	46.57	13.97	3.3
2021	22.8	47.13	10.17	5.75	50.43	29.17	6.28
2020	23.2	46.83	9.2	5.15	51.41	27.82	6.08
2019	23.45	54.19	8.4	4.75	67.05	33.39	7.51
2018	25.79	70.19	6.93	5.67	59.93	31.57	6.34
2017	33.77	111.78	7.14	4.17	58.33	30.39	8.5
2016	36.27	97.1	6.69	4	59.84	35.19	10.71
2015	36.21	102.68	5.67	3.5	61.79	36.36	10.98

6.3 Nestle India Ltd

Nestlé India has been delivering robust financial performance by way of strong ROE and ROI. This has resulted in the consistent rise of Earnings Per Share (EPS) over the years, meaning that profitability and growth have been sustained. Equally important, DPS has experienced a similar trajectory, there were few small dips in the trend.

Table 6.3: - Nestle India Ltd.

Year	ROE (%)	ROI (%)	EPS	Dividend per Share	Payout (%)	P/E Ratio	P/BV Ratio
2024	56.04	306.86	66.55	56.5	111.93	48.15	32.13
2023	46.35	295.92	73.06	157.5	161.34	49.66	26.33
2022	35.71	142.26	61.72	35	24.29	43.58	15.13
2021	30.85	112.41	46.7	15	26.75	65.99	18.33
2020	32.59	60.45	39.48	12.5	27.87	62.96	18.45
2019	36.7	61.91	35.16	11	28.44	48.11	15.72
2018	46.9	57.43	31.81	10	25.15	42.06	15.93
2017	48.11	66.85	24.32	8	32.89	44.39	20.89
2016	49.27	145.95	14.4	6	41.72	29.29	11.79
2015	40.2	130.18	9.06	4.25	46.94	28.93	9.77

The payout ratio has stayed quite high, which means a lot of earnings may be paid out to shareholders as dividends. Nestlé India P/E ratio was historically high, indicating that it is reasonably good in terms of valuation at this time. At the same time, the Price-to-Book Value (P/BV) ratio has fluctuated from year to year, with some of these years showing unusually high valuation levels that are out of sync with market sentiment or asset growth trends.

6.4 Britannia Industries Ltd

Britannia Industries Ltd has shown very good financial performance considering ROE and ROI overall with certain fluctuations over certain years. The company has improved profitability and operational efficiency and as a result, Earnings Per Share (EPS) keeps growing steadily. As we can see, there have been some significant changes to the dividend per share, lately it's more than doubled and this could be a sign that Barratt is serious about returning cash back to shareholders - at least while it's making profits. How the payout ratio has ebbed and flowed is a manifestation of how the company has revised its dividend policy over time to help balance shareholder returns with reinvestment options. Price-to-Earnings (P/E) ratio is also on higher side, which means investors value the stock at premium given its leadership position in market. The Price-to-Book Value (P/BV) ratio, on the other hand, has fluctuated, with some years showing higher valuations based on trends in financial performance and investor sentiment. All things considered,

the business continues to have a solid financial base and the potential for long-term growth in the FMCG industry.

Table 6.4: - Britannia Industries Ltd.

Year	ROE (%)	ROI (%)	EPS	Dividend per Share	Payout (%)	P/E Ratio	P/BV Ratio
2024	108.52	306.86	247.93	220	84.7	79.05	76.84
2023	106.84	295.92	219.71	200	91.03	89.7	97.63
2022	105.76	142.26	215.97	200	90.75	85.16	87.82
2021	70.39	112.41	204.15	342	149.88	72.45	74.32
2020	45.3	60.45	166.66	115	67.8	66.65	29.15
2019	36.56	61.91	127.07	86	67.68	61.74	22.11
2018	32.83	57.43	103.85	63	56.33	58.06	17.71
2017	31.32	66.85	58.42	48.5	100	99.69	19.93
2016	45.51	145.95	122.87	63	56.48	51.92	21.68
2015	53.62	130.18	107.62	48.5	45.06	49.22	21.56

6.5 Godrej Consumer Products Ltd

Godrej Consumer Products Ltd: This stock has very consistent set of financials over the years, with stable Return on Equity as well as ROI. Wal-Mart Stores Earnings Per Share (EPS) trend has been on an increasing trajectory and this positive sign is a clear message of such creating a bridge to profitability as well as effective financial strategies handling. Nice for income investors But auto rescheduling your payday cash advance — or far worse, bank turning together out! — could lead to you paying far more identical day loans with lenders. Although the payout ratio has varied, it has historically remained in a reasonable range allowing for reinvestment along with dividend distribution. The stock appears to be fairly valued in relation to its earnings potential, as indicated by the Price-to-Earnings (P/E) ratio, which has stayed within a moderate range.

Table 6.5: - Godrej Consumer Products Ltd.

Year	ROE (%)	ROI (%)	EPS	Dividend per Share	Payout (%)	P/E Ratio	P/BV Ratio
2024	20.82	27.34	14.46	0	0	51.67	9.73
2023	21.32	26.82	11.97	0	0	60.88	11.72
2022	23.47	32.73	11.54	8	69.31	45.12	10.38
2021	36.69	51.06	17.17	10	69.89	40.02	14.26
2020	22.18	25.25	9.79	10	70.07	74.43	16.04
2019	20.78	23.06	7.91	15	24.23	70.4	13.01

Year	ROE (%)	ROI (%)	EPS	Dividend per Share	Payout (%)	P/E Ratio	P/BV Ratio
2018	20.17	27.63	7.07	5.75	0	65	12.41
2017	20.43	27.84	6.05	5.5	30.31	57.34	10.47
2016	19.53	25.49	5.23	5.25	33.43	54.25	9.59
2015	19.34	32.24	4.73	5	35.24	54.92	9.6

Comparably, although it has fluctuated, the Price-to-Book Value (P/BV) ratio has generally stayed moderate, indicating a balanced valuation in relation to the company's assets.

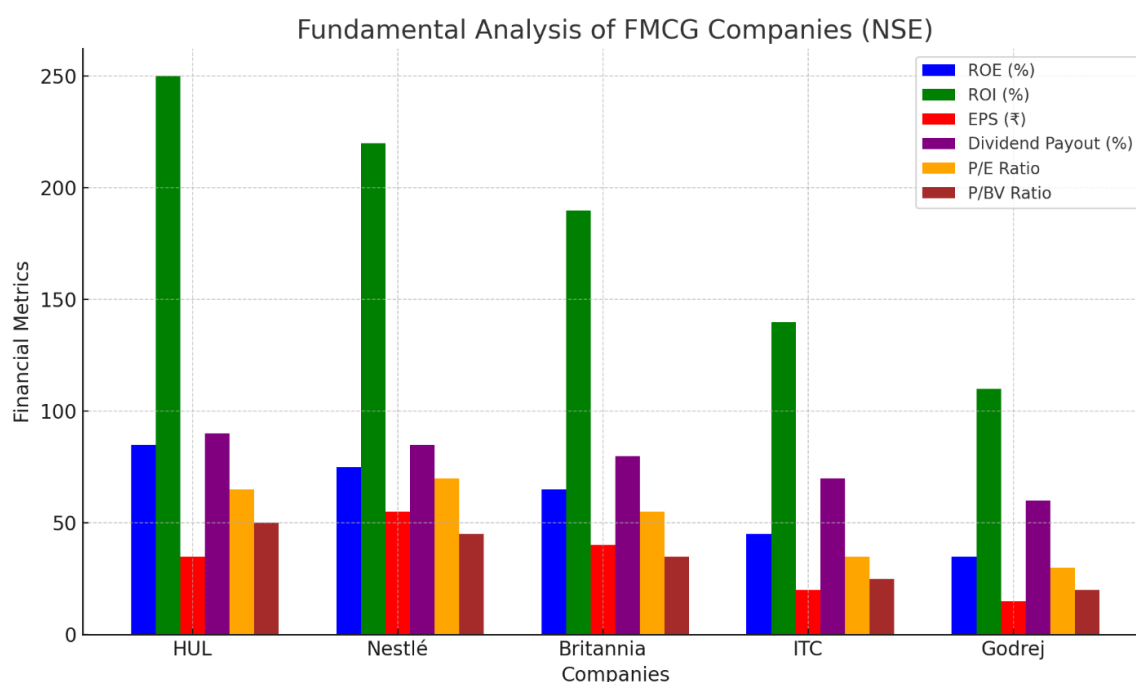


Fig 6.1 - FMCG Financial Analysis.

7. FINDINGS

Financial Ratios of FMCG Stocks — NSE India Companies given in the table are listed on the National Stock Exchange (NSE) of India, and they have strong Financial Stability with steady Earning for Growth & Dividends. HUL, Nestlé India and Britannia Industries have high ROE, ROI along with premium market valuations besides ITC Ltd and Godrej Consumer Products exhibiting financial resilience with moderate valuations and steady dividends. The FMCG stocks are regarded as the defensive investment that face low market volatility, strong brand positioning and consistent demand. But inflation, supply chain disruptions and regulatory policies all affect profitability, and these factors ought to be taken into account while making such investment decisions.

8. CONCLUSION

The report conveys a detailed fundamental analysis, financial performance review, profitability and investment potential of major FMCG companies based on key indicators ROE (Return on Equity), ROI (Return on Investment), EPS (Equity Earnings Per Share), P/E (Price to Earning) Ratio & Dividend

Payouts. The results show that these three companies have strong financials, stable earnings growth and high valuations that are due to their market premium, showing themselves as interesting proposals in the segment of investment. AT ITC Ltd and Godrej Consumer Products are stable but carry modest valuations and have been giving steady dividends, indicative of good-quality investment vehicles that are less aggressive. Moreover, the research highlights that FMCG is a defensive sector since demand for these products are non-cyclical in nature and will remain inelastic during an economic downturn as visitors tend to stay away from bars on account of strong brand loyalty. Their downside comes from stability, because they tend to be very stable companies, but their profitability will also be deeply affected by the inflation of inputs and supplies on one side, changes in regulatory environments or consumer habits. This increasing domination of digital profile, online operations and big data led to a drastic change in the behaviour as well as how Leather sector will be defined going forward calls for a much deeper search in to market scenario coupled with strategic investments. To extract the best and avoid the worst, investors should then look at market direction inferred via these indicators as well as macro data before they go about managing risk. By illuminating differences across different set of characteristics, our study contributes to a better understanding of performance variability in Fmcg stocks and will provide useful information to the investors, analysts and policymakers interested in delivering consistent returns from FMCG sector.

9. ACKNOWLEDGMENT

The authors truly value the contributions of academics and researchers whose work has shed light on how artificial intelligence affects employee well-being at work. We also want to thank our mentors and colleagues for their help, advice, and helpful criticism during this study.

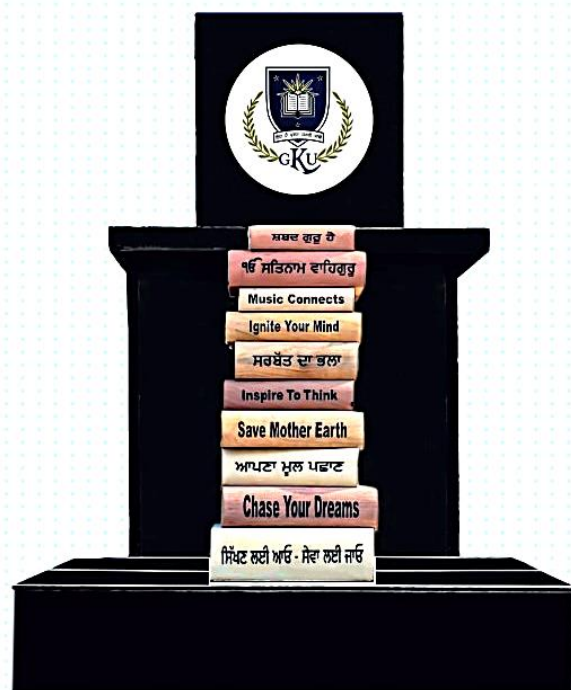
REFERENCES

- [1] A. Khalid, "A Research on The Paradigm Shifts of Marketing from 1.0 to 5.0': with Special Reference to Marketing Shifts in The FMCG Sector," SSRN Electronic Journal, 2023.
- [2] D. Chauhan, S. Goel and A. Gaur, "A Study on Impact of Advertising, Packaging and Branding of FMCG Products: Consumer Behaviour Analysis in Delhi NCR," Global Journal of Enterprise Information System, vol. 15, no. 1, pp. 58-66, 2023.
- [3] G. Srivastava, "Influence of Green Marketing on Buying Behavior of the Consumers of Selected FMCG Products with Special Reference to Delhi NCR," 2023.
- [4] G. Tadoori and U. K. Vadithala, "Empirical Evidence on the Relation between ESGD Performance & Financial and Market Performance: Evidence from the Indian FMCG Sector," International Journal of Advanced Research in Commerce, Management & Social Science (IJARCMSS), vol. 101, pp. 101-110, 2023.
- [5] H. R. Asyara, G. Gin, P. Rakashiwi and G. Djuanda, "Fundamental Analysis in The Consumer Goods Industry Sector, Cigarettes, Food & Beverages and Household Needs During the Pandemic," Penerbit Tahta Media, 2023.
- [6] M. H. Dachan and S. Sherif, "The Reverse Supply Chains of the Fast-Moving Consumer Goods: The Impacts of Product Returns on Reverse Supply Chains in Sweden," 2023.
- [7] M. Pushkar and A. S. Rajput, "Examine the impact of advertising media on the consumer purchasing behavior of FMCG Products," 2023.

- [8] P. Andiani, H. Hermawan, R. Septian and G. Djuanda, "Fundamental analysis of the non-primary consumer goods industry in the automotive and components, durable household goods and textiles sub-sectors during the pandemic period," Penerbit Tahta Media, 2023.
- [9] P. Bednarz, "The impact of Social Media on the FMCG Market: A Case Study of Bangladesh," International Journal of Management and Economics Fundamental, vol. 3, no. 6, pp. 7-10, 2023.
- [10] P. Chauhan, D. Bangwal and R. Kumar, "Managing the logistics distribution performance using digitalization in the FMCG sector," Vision, 2023.
- [11] R. Bagchi, "Impact of Corporate Performance Indicators on Stock Price: A Study on Select FMCG Companies in India," Sustainable Excellence: A Contemporary Business Perspective, pp. 209, 2023.
- [12] R. Kumar Arora, A. Satinderbir Kaur, B. Bhatia and K. Mittal, "Issues and Opportunities of the FMCG Sector in the Indian Rural Market," 2023.
- [13] S. Balaji and J. A. Edward, "Construction of Optimal Portfolio Using Sharp Index Model with Special Reference to Banking, Pharmaceutical and FMCG Sectors," in Current Trends in Economics, Business and Sustainability, ICEBS 2023, Singapore: Springer, 2023.
- [14] S. Biswas, G. Bandyopadhyay and B. Guha, "Effect of COVID-19 on Stock Price: A Time Series-Based Analysis of FMCG and Consumer Durables Sector in India," in Applications of Operational Research in Business and Industries, Singapore: Springer, 2023.
- [15] S. Nishad and S. M. Ghouse, "A Study on Equity Analysis on FMCG Sector," Current Research in Mutual Funds and Stock Market, pp. 69, 2023.

JKU Faculties

- + Faculty of Agriculture
- + Faculty of Computing
- + Faculty of Education
- + Faculty of Engineering & Technology
- + Faculty of Health & Allied Sciences
- + Faculty of Law
- + Faculty of Management & Commerce
- + Faculty of Pharmaceutical Sciences
- + Faculty of Physical Education
- + Faculty of Sciences, Humanities & Languages
- + Faculty of Visual & Performing Arts



Connect with us:

Guru Kashi University, Talwandi Sabo, Bathinda – 151302, Punjab (India)



[GuruKashiUniversityJKUOfficial](https://www.youtube.com/GuruKashiUniversityJKUOfficial)



[gurukashiuniv](https://twitter.com/gurukashiuniv)



[gurukashiuniversity](https://www.instagram.com/gurukashiuniversity)



[gurukashiuniversity](https://www.facebook.com/gurukashiuniversity)

www.gku.ac.in

+91 99142 83400

info@gku.ac.in