

# PERCEPTION OF ACTIVE VIDEO GAMING IN ENHANCEMENT OF PHYSICAL ACTIVITY AMONG ADOLESCENTS

*Original Research*

Laiba Farooq<sup>1</sup>, Nosheen Manzoor<sup>2\*</sup>, Areeba Rizwan<sup>3</sup>, Isha Fatima<sup>4</sup>, Nayla Ijaz<sup>1</sup>, Sonia Babar<sup>5</sup>

<sup>1</sup>Physiotherapist, Department of Physical Therapy, DHQ Sheikhpura, Pakistan.

<sup>2</sup>Assistant Professor, Department of Physical Therapy and Rehabilitation Sciences, School of Health Sciences, University of Management and Technology, Lahore, Pakistan.

<sup>3</sup>Physiotherapist, Department of Physical Therapy, Johar Pain Relief Centre, Lahore, Pakistan.

<sup>4</sup>Internee, Department of Physical Therapy, Data Science Knowledge Stream, Lahore, Pakistan.

<sup>5</sup>Clinical Physiotherapist, Department of Physical Therapy, The Next College, Multan, Pakistan.

**Corresponding Author:** Nosheen Manzoor, Assistant Professor, Department of Physical Therapy and Rehabilitation Sciences, School of Health Sciences, University of Management and Technology, Lahore, Pakistan. [nosheenmanzoor@umt.edu.pk](mailto:nosheenmanzoor@umt.edu.pk)

Conflict of Interest: None

Grant Support & Financial Support: None

## Abstract

**Background:** Active Video Games (AVGs) require players to perform movements that are mirrored by characters on-screen, integrating physical activity into gaming. This synergy of technology and exercise provides a dynamic way to remain active by engaging in digital entertainment, redefining traditional video gameplay.

**Objective:** This study aims to assess adolescents' perceptions of active video gaming and explore its association with physical activity, considering AVGs potential to alter exercise behaviors.

**Methods:** A cross-sectional study was conducted with 385 adolescents aged 12-25 years. The study was divided into three phases: initial demographic data collection, assessing awareness of AVGs through a questionnaire, and evaluating perceptions of AVGs via diverse inquiry methods to understand their impact on physical activity levels.

**Results:** Findings indicate a robust correlation between active video gaming and increased physical activity among adolescents, with a notably positive perception of AVGs. The majority of participants (68%) reported a favorable view towards AVGs as a form of exercise, and 62% acknowledged an increase in their physical activity levels due to AVGs.

**Conclusion:** AVGs demonstrate significant potential as a motivational tool for increasing physical activity among youth, making exercise more accessible and appealing through gamified experiences. There remains a keen interest among adolescents to learn more about the benefits of AVGs.

**Keywords:** Active Video Gaming, Exergames, Exergaming, Gaming, Health, Physical Activity, Sedentary Lifestyle.

## INTRODUCTION

Active video gaming, characterized by the engagement of bodily movements to control gameplay, emerges as a compelling medium for promoting physical activity among adolescents. Traditionally, the term "gaming" encompasses both computer and video games, yet active video games distinguish themselves by requiring physical involvement, mirroring the actions of on-screen characters. This genre offers a unique opportunity for individuals less inclined toward conventional exercise to increase their energy expenditure significantly. For those unable or unwilling to engage in traditional sports—be it due to physical limitations, personal discomfort in group settings, or external circumstances such as inclement weather or health-related restrictions—active video games provide a viable alternative to maintaining physical fitness.

Physical fitness, essential for meeting daily life demands or enhancing athletic performance, is often viewed as a more accurate, albeit indirect, reflection of physical activity than self-reported measures. The standard definition of physical activity involves skeletal muscle movements that produce body motion and expend energy. Within this context, active video games have shown promising results in increasing physical activity levels, thereby addressing issues of obesity and sedentary lifestyles prevalent among young populations.

However, the integration of active video games is not without challenges. The World Health Organization has recognized a growing concern over gaming disorders, which manifest as excessive or compulsive gaming behaviors that disrupt daily functioning. Scholars like Fatimah Asleed have linked such behaviors to increased anxiety, depression, and sleep disturbances, suggesting the need for a balanced approach to gaming. This highlights the importance of a nuanced discussion regarding the hidden costs associated with active video gaming and its broader implications for mental and emotional well-being.

Moreover, educational institutions could benefit from incorporating active video gaming into their physical education curricula, supporting the development of innovative strategies to foster active lifestyles among students. Despite the benefits, some studies indicate that children who engage in active video gaming do not necessarily exhibit higher overall physical activity levels compared to those playing passive video games. This contradiction points to the complexity of gaming's impact on habitual physical activity, with some research suggesting that while active video gaming increases energy expenditure, its effect on long-term physical activity habits remains unclear.

In summary, the current literature on active video gaming offers insightful perspectives on its potential to enhance physical health through therapeutic interventions, often showing comparable or superior outcomes to traditional care. However, the scope of research must broaden to differentiate more clearly between the impacts of active and passive gaming. The objective of ongoing studies should be to elucidate the mechanisms through which active video gaming can be optimally utilized to foster enduring physical activity habits among youth, ensuring that its implementation in both medical and educational settings is based on robust, evidence-driven strategies.

## METHODS

This cross-sectional study employed non-probability convenience sampling to investigate the role of active video gaming in enhancing physical activity among adolescents. Recruitment was carried out across various educational institutions—both private and government-run schools, colleges, and universities in Punjab. To gather comprehensive data, both manual and digital methods were utilized; participants were provided with questionnaires in physical form and online, which probed into their gaming habits, physical activity levels, and perceptions towards active video gaming. The inclusion criteria targeted adolescents aged 12-25 years from both genders who were interested in, could enjoy, and regularly engaged in active video gaming for at least one hour per week. Conversely, the study excluded those who were not willing to participate, used virtual reality for gaming, were already using active video gaming for rehabilitation purposes, had physical or neurological limitations preventing them from understanding or performing active video games, suffered from cardiovascular or respiratory disorders, lacked access to necessary technology, or held personal preferences that precluded participation.

Upon agreeing to participate, individuals were informed about the study details, and their consent was obtained, assuring them of their right to withdraw at any point without consequence. The confidentiality of participant data was strictly maintained, accessible only to

the research team and supervisors. Data collection was facilitated through a 21-item structured questionnaire that was divided into three sections, designed to capture a range of relevant information from the respondents.

For the statistical analysis, the data was processed using SPSS Statistics-Version 26. Demographic information such as names, ages, and genders were summarized using mean  $\pm$  SD for continuous variables and minimum and maximum values where appropriate. Categorical variables were presented using frequencies and percentages, depicted in tables and pie charts. Associations between variables were examined using Pearson's chi-square statistics, with a significance threshold set at 5%.

The ethical considerations for this research were rigorously upheld, with formal approval granted by the ethical committee of the University of Management and Technology (UMT), Lahore. This ensured that the study adhered to the highest standards of research ethics and integrity, contributing valuable insights into the potential of active video gaming as a tool for increasing physical activity among adolescents.

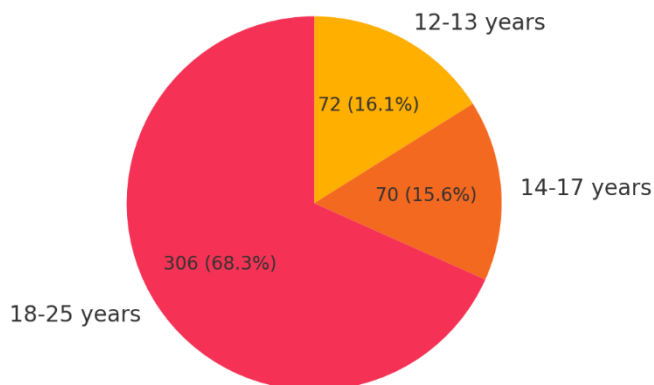
## RESULTS

In the study, 449 participants were recruited, with a noticeable distribution across various age groups: adolescents aged 12-13 years constituted 16.0% of the total, while those aged 14-17 years represented 15.6%. The largest group was the 18-25 year-olds, who comprised 68.0% of the total cohort. The gender distribution showed a higher proportion of females (62.9%) compared to males (36.9%). Regarding educational attainment, half of the participants (50.1%) held an undergraduate degree, followed by 25.8% with a secondary school education, 12.5% with postgraduate qualifications, and 11.6% at the middle school level.

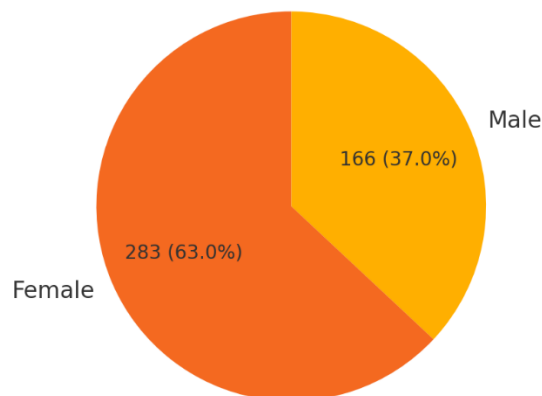
**Table 1 Demographic Characteristics of Participants**

Characteristic	Category	Frequency (%)
Age of Participants	12-13 years	72 (16.0%)
	14-17 years	70 (15.6%)
	18-25 years	306 (68.3%)
	Total	449 (100.0%)
Gender of Participants	Male	166 (37.0%)
	Female	283 (63.0%)
	Total	449 (100.0%)
Educational Level	Middle School	52 (11.6%)
	Secondary School	116 (25.8%)
	Undergraduate	225 (50.1%)
	Postgraduate	56 (12.5%)
	Total	449 (100.0%)

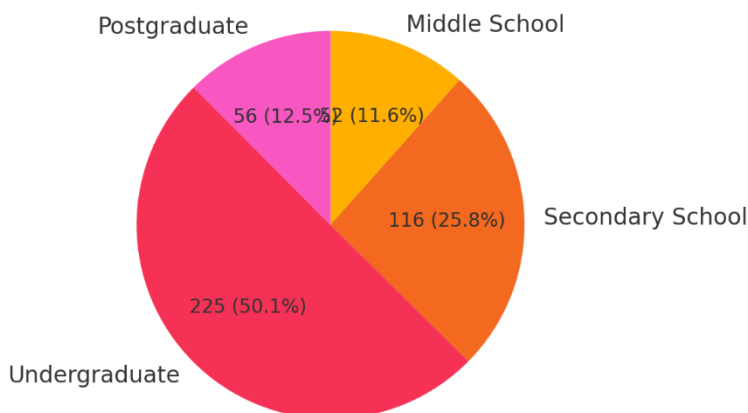
Age of Participants



Gender of Participants



Educational Level



Most participants (86.2%) were familiar with active video games, indicating a high level of awareness of this type of gaming within the sample. When asked about the specific games they were familiar with, Fitness Boxing and Pokémon Go were the most recognized, mentioned by 26.7% and 22.3% of valid respondents, respectively. Dance games and the Jump Rope Challenge were also popular. In terms of actual gameplay, Dance Revolution/Just Dance was the most played game, highlighted by 25.6% of the participants, followed by Pokémon Go and a variety of other games, suggesting diverse gaming preferences and experiences among the respondents.

**Table 2 Familiarity and Engagement with Active Video Games**

Question	Response	Frequency (%)
Are you familiar with Active Video Gaming?	Yes	387 (86.2%)
	No	62 (13.8%)
	Total	449 (100.0%)
Games you are familiar with	Just Dance/Dance Dance/Dance Central	56 (12.5%)
	Pokémon Go	100 (22.3%)

Question	Response	Frequency (%)
	Jump Rope Challenge	100 (22.3%)
	Fitness Boxing	120 (26.7%)
	Wii Fit/Wii Sports	37 (8.2%)
	More than 1 game	36 (8.0%)
	Total	449 (100.0%)
Active Video Games you have played	Dance Dance Revolution/Just Dance	115 (25.6%)
	Wii Fit	16 (3.6%)
	Pokémon Go	92 (20.5%)
	Others	226 (50.3%)
	Total	449 (100.0%)
How often do you engage in Active Video Gaming?	Daily	66 (14.7%)
	Weekly	196 (43.7%)
	Monthly	187 (41.6%)
	Total	449 (100.0%)
Factors influencing choice of Active Video Gaming	Cost	64 (14.3%)
	Type of Physical Activity	193 (43.0%)
	Gaming Marketing	110 (24.5%)
	Other	82 (18.3%)
	Total	449 (100.0%)

Frequency of engagement in active video gaming revealed that 43.7% of participants engaged weekly, while monthly engagement was reported by 41.6%. A smaller group of participants (14.7%) played these games daily. As for the factors influencing their choice of active video games, the type of physical activity was deemed most important by 43.0% of respondents, followed by gaming marketing (24.5%) and cost (14.3%).

The participants' attitudes towards active video games were generally positive, with 55.5% believing them to be a better option for physical activity compared to passive video games, and 70.6% finding active video gaming enjoyable. When discussing the benefits, the majority (82.7%) cited improved mental and physical health and lifestyle as the primary advantage, with increased coordination and balance, and social interaction also noted as significant benefits.

**Table 3 Perceptions and Benefits of Active Video Gaming**

Question	Response	Frequency (%)
Do you think that Active Video Games are a better option in terms of physical activity than passive video games?	Yes	249 (55.5%)
	No	119 (26.5%)
	Maybe	81 (18.0%)

Question	Response	Frequency (%)
	Total	449 (100.0%)
Do you find Active Video Gaming enjoyable?	Yes	317 (70.6%)
	No	30 (6.7%)
	Maybe	102 (22.7%)
	Total	449 (100.0%)
Benefits you think Active Video Gaming can provide	Improved cardiovascular (Heart and blood vessels) fitness	20 (4.5%)
	Increased coordination and balance	30 (6.7%)
	Social interaction	27 (6.0%)
	Improved (mental & physical) health and lifestyle	372 (82.9%)
	Total	449 (100.0%)

This data underscores a moderate to high prevalence and favorable perception of active video gaming among the participants, suggesting its potential as a beneficial tool for enhancing physical activity and overall health in the adolescent to young adult demographic. The results point to the need for further exploration into how these games can be more effectively integrated into daily routines to maximize their health benefits.

## DISCUSSION

Active video gaming (AVG), or exergaming, appears to be a beneficial and safe means of promoting physical activity among adolescents, especially for those insufficiently active. Research has shown that engaging in AVGs for short periods can have intensity levels comparable to conventional physical activities such as walking, skipping, and running. This is particularly relevant for teenagers, who are generally less physically active, with this trend being more pronounced among girls. The data from this study supports the idea that most participants view AVGs as a preferable alternative to passive video games for physical activity, which aligns with previous findings suggesting that active gaming can promote mild to moderate physical activity. However, its impact on reducing sedentary behavior and influencing habitual physical activity remains unclear.

The study underscores the potential of AVGs to serve as a creative solution for increasing physical activity among adolescents. Behavioral theories suggest that integrating AVGs into physical activity interventions may enhance their effectiveness compared to traditional exercise methods. This aligns with findings from the current research, which indicated that AVG training had comparable effects on heart rate, oxygen consumption, and energy expenditure to typical physical activities. Furthermore, the enjoyment factor of AVGs, as reported by the majority of participants, highlights the potential for higher adherence rates, which is crucial for the long-term success of physical activity interventions.

Exergaming has also been shown to have significant social benefits, promoting social cohesion and peer support among adolescents, which are vital for adolescent socialization. The mediating effects of social presence perception and virtual sports experience suggest that AVGs can enhance young people's willingness to engage in sports and fitness activities. The positive impact on weight loss and physical health observed in this study corroborates the potential of AVGs to contribute significantly to combating obesity among youth populations.

However, the research is not without limitations. The study's reliance on self-reported data can introduce bias, as participants might overestimate their physical activity levels or the intensity of their engagement with AVGs. The cross-sectional nature of the study also limits the ability to establish causality between AVG engagement and long-term health outcomes. Future research should consider longitudinal designs to track changes over time and randomized controlled trials to assess the efficacy of specific AVG interventions.

In conclusion, AVGs present a promising avenue for increasing physical activity among adolescents, with potential benefits extending beyond physical health to include psychological and social well-being. However, individual differences in effort levels and specific activity recommendations should be considered to optimize the use of active gaming in promoting physical activity levels. As AVGs continue to evolve, they may play a crucial role in shaping an active lifestyle for a generation that is increasingly sedentary, thereby contributing to the broader public health agenda of increasing physical activity across all age groups.

## CONCLUSION

Active video gaming has demonstrated potential as a preliminary step towards engaging adolescents in more conventional exercise routines, thereby promoting lifelong physical activity habits. This study supports the existence of a positive correlation between active video gaming and increased physical activity among adolescents, suggesting that these games could play a crucial role in enhancing physical activity engagement. Additionally, active video gaming appears to cultivate a more favorable perception of exercise among adolescents, potentially facilitating a significant cultural shift towards health consciousness in youth populations. Such shifts are essential for fostering a robust foundation of health and wellness that can last a lifetime.

## REFERENCES

1. Staiano AE, Adams MA, Norman GJ. Motivation for exergame play inventory: Construct validity and relationship to game play. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*. 2019;13(3).
2. Foley L, Maddison R. Use of active video games to increase physical activity in children: a (virtual) reality? *Pediatr Exerc Sci*. 2010;22(1):7-20.
3. Baranowski T, Abdelsamad D, Baranowski J, O'Connor TM, Thompson D, Barnett A, et al. Impact of an active video game on healthy children's physical activity. *Pediatrics*. 2012;129(3)
4. Williams PT. Physical fitness and activity as separate heart disease risk factors: a meta-analysis. *Med Sci Sports Exerc*. 2001;33(5):754.
5. Morris JN. Exercise in the prevention of coronary heart disease: today's best buy in public health. *Med Sci Sports Exerc*. 1994;26(7):807-14.
6. Füssenich LM, Boddy LM, Green DJ, Graves LE, Foweather L, Dagger RM, et al. Physical activity guidelines and cardiovascular risk in children: a cross-sectional analysis to determine whether 60 minutes is enough. *BMC Public Health*. 2015;16:1-7.
7. Alsaad F, Binkhamis L, Alsalman A, Alabdulqader N, Alamer M, Abualait T, et al. Impact of action video gaming behavior on attention, anxiety, and sleep among university students. *Psychol Res Behav Manag*. 2022:151-60.
8. Biddiss E, Irwin J. Active video games to promote physical activity in children and youth: a systematic review. *Arch Pediatr Adolesc Med*. 2010;164(7):664-72.
9. O'Loughlin EK, Dugas EN, Sabiston CM, O'Loughlin JL. Prevalence and correlates of exergaming in youth. *Pediatrics*. 2012;130(5):806-14.
10. LeBlanc AG, Chaput J-P, McFarlane A, Colley RC, Thivel D, Biddle SJ, et al. Active video games and health indicators in children and youth: a systematic review. *PLoS One*. 2013;8(6)
11. Staiano AE, Flynn R. Therapeutic uses of active videogames: a systematic review. *Games Health J*. 2014;3(6):351-65.
12. Wagener TL, Fedele DA, Mignogna MR, Hester CN, Gillaspay SR. Psychological effects of dance-based group exergaming in obese adolescents. *Pediatr Obes*. 2012;7(5)
13. Kann L. Youth risk behavior surveillance—United States, 2017. *MMWR Surveill Summ*. 2018;67.

14. Telford RM, Telford RD, Olive LS, Cochrane T, Davey R. Why are girls less physically active than boys? Findings from the LOOK longitudinal study. *PLoS One*. 2016;11(3)
15. Merino Campos C, del Castillo Fernández H. The benefits of active video games for educational and physical activity approaches: A systematic review. *J New Approaches Educ Res*. 2016;5(2):115-22.
16. Ningning W, Wenguang C. The effect of playing e-sports games on young people's desire to engage in physical activity: Mediating effects of social presence perception and virtual sports experience. *PLoS One*. 2023;18(7)
17. Arnaez J, Frey G, Cothran D, Lion M, Chomistek A. Physical wellness among gaming adults: cross-sectional study. *JMIR Serious Games*. 2018;6(2)
18. Staiano AE, Marker AM, Beyl RA, Hsia DS, Katzmarzyk PT, Newton R. A randomized controlled trial of dance exergaming for exercise training in overweight and obese adolescent girls. *Pediatr Obes*. 2017;12(2):120-8.
19. Sween J, Wallington SF, Sheppard V, Taylor T, Llanos AA, Adams-Campbell LL. The role of exergaming in improving physical activity: a review. *J Phys Act Health*. 2014;11(4):864-70.
20. Staiano AE, Beyl RA, Hsia DS, Katzmarzyk PT, Newton Jr RL. Twelve weeks of dance exergaming in overweight and obese adolescent girls: Transfer effects on physical activity, screen time, and self-efficacy. *J Sport Health Sci*. 2017;6(1):4-10.
21. Mellecker R, McManus A. Active video games and physical activity recommendations: A comparison of the Gamercize Stepper, XBOX Kinect and XaviX J-Mat. *J Sci Med Sport*. 2014;17(3):288-92.
22. Corepal R, Best P, O'neill R, Tully MA, Edwards M, Jago R, et al. Exploring the use of a gamified intervention for encouraging physical activity in adolescents: a qualitative longitudinal study in Northern Ireland. *BMJ Open*. 2018;8(4)
23. Pope L, Garnett B, Dibble M. Lessons learned through the implementation of an eHealth physical activity gaming intervention with high school youth. *Games Health J*. 2018;7(2):136-42.
24. Williams WM, Ayres CG. Can active video games improve physical activity in adolescents? A review of RCT. *Int J Environ Res Public Health*. 2020;17(2):669.
25. Simons M, de Vet E, Brug J, Seidell J, Chinapaw MJ. Active and non-active video gaming among Dutch adolescents: Who plays and how much? *J Sci Med Sport*. 2014;17(6):597-601.
26. Zamani E, Chashmi M, Hedayati N. Effect of addiction to computer games on physical and mental health of female and male students of guidance school in city of Isfahan. *Addiction Health*. 2009;1(2):98.