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Assessing the Influence of E-Gaming on the Sports Performance of Junior High School Students

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Abstract: ***Electronic games are seen as a promising avenue for children's development, offering a range of engaging and educational experiences that cater to various learning styles. Unlike traditional toys, these digital environments provide dynamic, interactive worlds that can ignite curiosity and motivation. This study aims to investigate the impact of e-gaming on the sports performance of junior high school students. The sample selection process was thorough, utilizing both purposive and convenience sampling methods to ensure a representative sample from the broader population, specifically focusing on junior high school students in Rohtak City, Haryana. Data was collected through a questionnaire distributed to 600 randomly selected respondents, resulting in 500 responses, of which 400 were suitable for analysis. The analysis, conducted using various statistical techniques and software tools like MS Excel and SPSS, revealed that while there are positive perceptions of e-gaming, including health benefits and increased engagement, a significant proportion of respondents remain neutral or skeptical about its impact on physical and mental health, as well as its effectiveness in promoting physical activity. Further research is needed to develop evidence-based guidelines for responsible e-gaming practices, particularly when integrated into sports training or physical activity programs, to maximize benefits and minimize risks for different age groups and individual needs.***

Keywords: e-gaming, sports performance, junior high school, technology, India

1. Introduction

Play is intrinsic to a child's being, intricately molding their character through joy, discovery, and creativity. Starting from their earliest interactions, babies immerse themselves in this essential pursuit, molding their cognitive, affective, and interpersonal capacities. Psychologists have long acknowledged the diverse effects of play on shaping personality, emphasizing its crucial role in nurturing balanced individuals (Pellas et. al, 2021). As young minds enter the pivotal kindergarten phase, where personality begins to take shape, there is a query: can electronic games, with their contemporary approach to play, offer beneficial contributions during this crucial developmental period? Initially, electronic games appear to be a favorable path for growth. Their range includes a variety of stimulating, engaging, intellectual, and instructional experiences, appealing to different learning preferences and fascinations. Unlike conventional toys, these digital environments provide lively, interactive realms, potentially sparking interest, and drive in a manner that stationary objects may not. Furthermore, the availability of electronic games designed specifically for kindergarteners indicates an understanding of their distinct developmental requirements, providing learning opportunities suited to their young cognitive abilities. However, before fully embracing virtual escapades, it is important to recognize the possible drawbacks. While the passage highlights numerous advantages, it does not provide details on the specific types of electronic games or present research backing up their claimed advantages. Without a more profound comprehension, it is challenging to evaluate the accuracy of these assertions. Furthermore, prolonged screen exposure is a widely acknowledged concern for children's development, potentially affecting their ability to focus, sleep, and engage socially. Striking a balance between electronic gaming and other activities such as physical play and outdoor exploration is crucial. Moreover, children are diverse individuals (Grounder, 2015). What is effective for one child may not be suitable for another. Variations in personality, learning methods, and attention spans require a customized strategy. Parental supervision is essential, ensuring thoughtful selection of electronic games that match each child's distinct requirements and passions. Emphasis should be placed on the quality and educational merit of electronic games, favoring those crafted with age-appropriate material and distinct learning goals. The COVID-19 pandemic posed a distinctive challenge for families, requiring them to adjust to home confinement and manage unfamiliar circumstances. As indicated by studies conducted by Badran (2020) and Al-Khouli (2021), this isolation contributed to a marked rise in psychological disorders across various age brackets, with children facing heightened vulnerability. Confronted with the task of keeping their children engaged and amused while handling their own worries, parents looked to electronic games as a possible remedy. While electronic games undoubtedly offer advantages like amusement, social engagement, and cognitive stimulation, their influence on children's mental well-being during the pandemic presents a multifaceted issue with both favorable and unfavorable aspects. As children progressively involve themselves in electronic games, psychologists and educators are hurrying to grasp their effects (Poonam et al., 2022) . Despite the potential advantages of electronic games in cognitive growth, social engagement, and even physical abilities, there are apprehensions regarding excessive screen time, addiction, and exposure to inappropriate content (Schade, 2020). Gender disparities in preferred game genres and motivations add further complexity to the situation. This expanding awareness is essential for promoting responsible gaming behaviors, developing successful educational electronic games, and ultimately protecting children's welfare in the digital era. It is important to remember that maintaining balance and being mindful are essential for navigating the intricate realm of virtual experiences. The lockdowns imposed due to COVID-19 brought the impact of electronic games on both children and adults to the forefront of research. This was driven by concerns about the consequences of the restrictions on domestic life. The pressing nature of this issue was underscored by the International Scientific Conference convened in Berlin in June 2020, focusing on "Electronic Games and their Influence on Children in the Context of the Corona Pandemic. " This virtual conference, conducted over

Zoom, emphasized the worldwide urgency to comprehend the diverse impacts of electronic games, particularly during extraordinary times, to safeguard the welfare of both children and adults in this evolving digital environment. As electronic games become increasingly popular among children, researchers are acknowledging a significant gap in studies that provide a thorough examination of both the positive and negative impacts on children's development and behavior (Rathee et al., 2023) . This imbalance in research impedes a nuanced comprehension of the actual effects of electronic games, leaving parents, educators, and policymakers with insufficient guidance.

The objective of this research is to explore the viewpoints of junior high school students concerning the impact of electronic gaming on their sports performance.

2. Literature Review

(Pelletier et al., 2020) conducted a scoping review to explore the potential relationships between video game usage and physical health. They identified observational and experimental studies related to this topic and screened them using a two-phase method. “After screening, twelve peer-reviewed articles were selected for further analysis. The review found preliminary evidence suggesting that increased time spent gaming is associated with certain health outcomes. Specifically, higher gaming time was linked to higher body mass index and lower self-reported general health status. However, the review did not find enough evidence to draw conclusions about the association between gaming time and other health indicators such as physical activity, sedentary behaviors, sleep, fatigue, musculoskeletal pain, or dietary behaviors. Overall, while there is some indication of a connection between increased video game playing time and negative physical health outcomes, the available evidence is limited, and further research is needed to draw definitive conclusions”.

(Lemay et al., 2024) examined “67 adolescent esports players (ESp) and compared them to 109 recreational gamers in high school (nESp). The study compared the two groups based on sociodemographic and academic characteristics, online and offline activities, and psychological characteristics. The results revealed that ESp spent more time on online activities and had a higher proportion of problematic gaming compared to the nESp group. ESp also reported more positive consequences on their physical health and more negative consequences on their education compared to the nESp group. These findings highlight the importance of screening for gaming problems among adolescent esports players and suggest that targeted prevention efforts should address both the positive and negative consequences of gaming for this group”.

(Gao & Chen, 2014) conducted a synthesis of “the impact of field-based exergames on children's physical and psychosocial outcomes. They identified 34 articles from 104 peer-reviewed publications that met the inclusion criteria and focused on the effects of exergames in field-based settings. The study found that the effects of field-based exergames on children's habitual physical activity and obesity-related outcomes remain unclear due to design problems, measurement issues, and other methodological concerns. Despite these challenges, exergames are appealing to children, and strategies are needed to sustain their interest. Overall, exergames are seen as a promising addition to promoting physical activity and health”.

(Norris et. al, 2016) assessed “the quality of evidence regarding the effects of school active video game (AVG) use on physical activity and health outcomes. They searched online databases and gray literature for studies that met specific inclusion criteria, including the use of AVGs in school settings, assessment of health or physical activity outcomes, and comparison with a control group or comparison phase. Twenty-two reports were identified, with varying outcomes. While some studies found greater physical activity in AVG sessions compared to controls, others reported mixed effects on body composition. Overall, the quality of evidence was low to moderate, with shortcomings in blinding, participation rates reporting, and confounding variables handling noted in many studies”.

(Neset et. al, 2020) developed and evaluated “a serious game focused on climate adaptation, targeting high school students, practitioners, and politicians. The game aims to provide an immersive experience of the impacts of climate adaptation measures and their links to selected Agenda 2030 goals. Players are tasked with considering these goals while mitigating the impacts of hazardous climate events. The game's design is rooted in Education for Sustainable Development principles, emphasizing comprehensive views, action competence, learner engagement, and pluralism. The study, based on game sessions and surveys with high school students in Sweden, evaluates how different aspects of the game contribute to an increased understanding of the needs and benefits of adaptation actions. Results suggest that the game effectively engages players in reflecting on climate adaptation decision-making challenges. However, the study highlights the difficulty of including a high degree of complexity, which can make it challenging to understand the consequences of individual measures and link them to the variability of extreme climatic events”.

(Liang & Lau, 2014) conducted “a systematic evaluation of active videogames (AVGs) on physical activity (PA) and related outcomes in healthy children. They searched electronic databases for articles published from January 2000 to August 2013. Included studies needed to be original, published in English, and in peer-reviewed journals. They should involve healthy participants under 18 years old and measure at least one PA-related cognitive, psychosocial, or behavioral outcome. All study designs were considered, but only intervention studies with PA comparison between groups or across time were evaluated for methodological quality. Fifty-four articles were identified, including studies on immediate PA effects, surveys, and intervention studies. AVGs were found to lead to light to moderate-intensity PA, particularly in structured AVG play settings. However, there was no significant effect of AVGs on PA in the home setting, and evidence for their impact in multiple settings was inconclusive”.

(Dindar, 2018) examined “the video gaming habits of 479 high school students, focusing on gender differences and the

correlation between video gaming, academic performance, and Complex Problem-Solving skills (CPS). The study measured various aspects of video gaming, including gaming experience, time spent gaming, frequency of gaming, perceived gaming skills, playing alone versus playing with a team, and game genre preferences. CPS was evaluated using the "Programme for International Student Assessment (PISA) 2012" Creative Problem-Solving test. The results indicated that male students had more experience and skills in video gaming and spent more time gaming than female students. Surprisingly, females played video games more frequently than males. However, the study did not find any significant relationship between video gaming habits and CPS or academic success".

2.1 Research objective

The objective of this research is to investigate the consequences of electronic gaming on the athletic performance of adolescents in junior high school.

3. Research methodology

This study uses an empirical approach, utilizing both primary and secondary data from reputable sources such as newspapers, journals, and official websites. The sample selection process was meticulous, employing a combination of purposive and convenience sampling methods to ensure a representative sample from the broader population. The study specifically focused on junior high school students in Rohtak City, Haryana. Data was collected using a carefully designed questionnaire distributed to a random sample of 600 respondents, resulting in 500 responses. After validation, 400 responses were deemed suitable for analysis. The data was analysed comprehensively using various statistical techniques, aided by software tools like MS Excel and SPSS (Solanki & Chhikara, 2023) . This analysis included methods such as tabulations, percentage calculations, and other relevant analytical procedures to derive meaningful insights from the dataset.

4. Findings and discussion

Table 1: Demographic profile of the respondents

Category	*Sub-category*	*Frequency*	*Percentage*
Gender	Boys	200	50
	Girls	200	50
	Total	400	100
Residence	Urban	250	60
	Rural	150	40
	Total	400	100
Annual Income of family (in INR)	Below 500000	80	20
	500000-1000000	150	37.5
	1000000-2000000	100	25
	Above 2000000	70	17.5
	Total	400	100

Source: Researcher's compilation

Table 1 presents the demographic profile of the respondents, showcasing an equal distribution of gender, with 50% boys and 50% girls among the 400 respondents. In terms of residence, 60% lived in urban areas, while 40% resided in rural regions. Regarding annual family income, 20% of families reported an income below 500, 000 INR, 37.5% fell in the 500, 000-1, 000, 000 INR bracket, 25% were in the 1, 000, 000-2, 000, 000 INR bracket, and 17.5% reported an income above 2, 000, 000 INR. This data suggests a diverse sample in terms of income levels and residence, with an equal representation of genders.

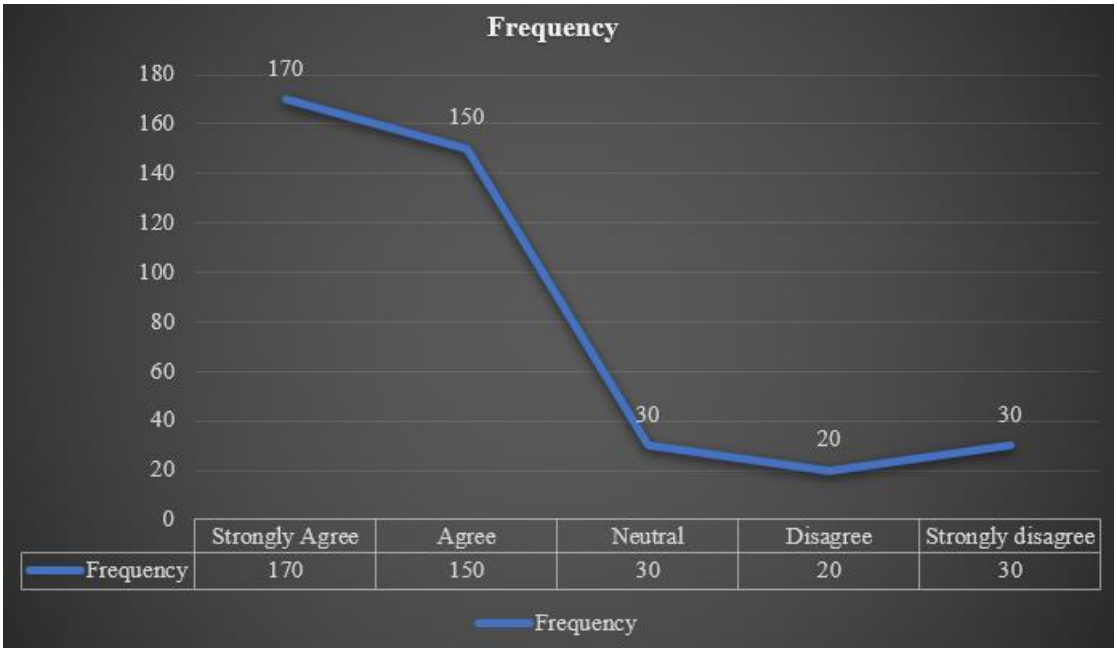

Figure 1: I believe that e-gaming leads to physical health improvement.
Source: Researcher's calculation

Figure 1 depicts the respondents' opinions on the statement "I believe that e-gaming leads to physical health improvement. " The data shows a range of responses, with 170 individuals (42.5%) strongly agreeing and 150 (37.5%) agreeing with the statement, indicating a significant portion of respondents believe in the positive impact of e-gaming on physical health. However, there are also respondents who expressed neutral (30, 7.5%), disagree (20, 5%), and

strongly disagree (30, 7.5%) views, suggesting some skepticism or disagreement regarding the perceived link between e-gaming and physical health improvement.

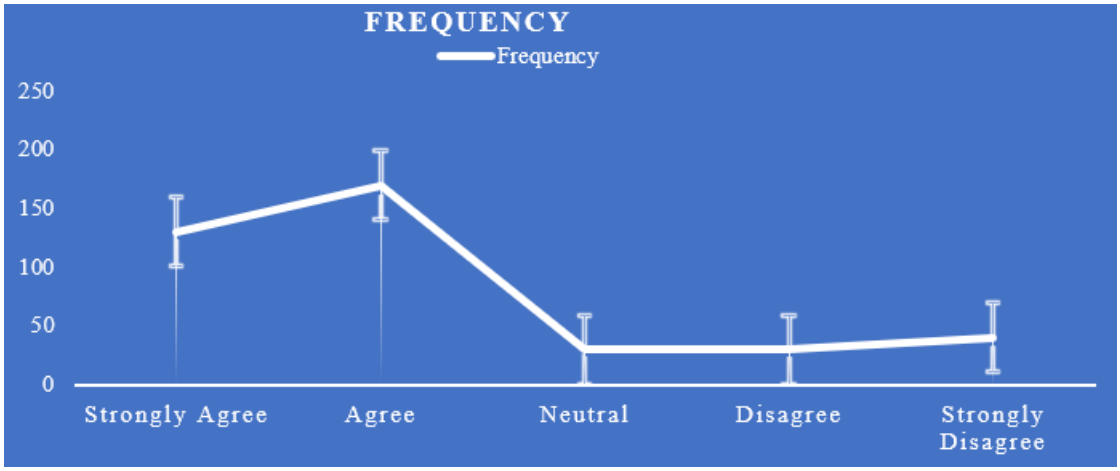

Figure 2: I believe that e-gaming leads to mental health improvement.
Source: Researcher' s calculations

Figure 2 illustrates the respondents' opinions regarding the statement "I believe that e-gaming leads to mental health improvement. " The data indicates that 130 individuals (32.5%) strongly agree and 170 (42.5%) agree with the statement, suggesting that a significant portion of respondents believe in the positive impact of e-gaming on mental health. However, there are also respondents who expressed neutral (30, 7.5%), disagree (30, 7.5%), and strongly disagree (40, 10%) views, indicating some level of uncertainty or disagreement regarding the perceived link between e-gaming and mental health improvement.

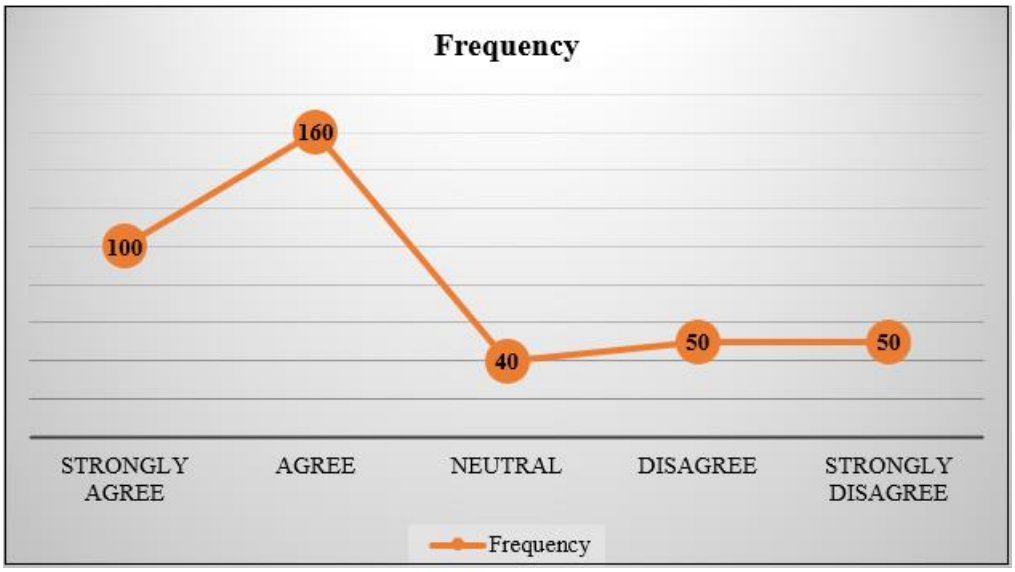

Figure 3: I believe that e-gaming is a fun and engaging way to promote physical activity.
Source: Author's calculations

Figure 3 presents the respondents' opinions on the statement "I believe that e-gaming is a fun and engaging way to promote physical activity. " The data shows that 100 individuals (25%) strongly agree and 160 (40%) agree with this statement, indicating that a majority of respondents view e-gaming as an enjoyable method to encourage physical activity. However, there are also respondents who are neutral (40, 10%), disagree (50, 12.5%), and strongly disagree (50, 12.5%), suggesting some skepticism or disagreement regarding the effectiveness of e-gaming in promoting physical activity. Overall, the figure suggests that while many see e-gaming as a fun way to promote physical activity, there is a notable portion that does not share this view.

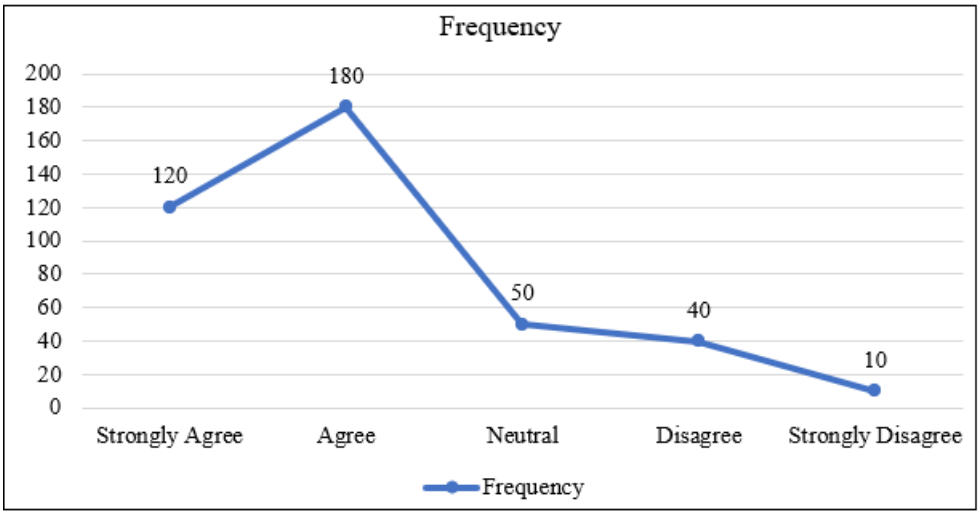

Figure 4: I believe that engaging in e-gaming can improve mood and reduce stress.
Source: Author's compilation

Figure 4 illustrates the respondents' perspectives on the statement "I believe that engaging in e-gaming can improve mood and reduce stress. " The data indicates that 120 respondents (30%) strongly agree and 180 (45%) agree with this statement, suggesting a considerable portion of respondents perceive e-gaming as a potential mood enhancer and stress reducer. Meanwhile, 50 individuals (12.5%) are neutral, 40 (10%) disagree, and only 10 (2.5%) strongly disagree. This indicates a general inclination among respondents to view e-gaming positively in terms of its impact on mood and stress levels, with a smaller percentage expressing skepticism or disagreement.

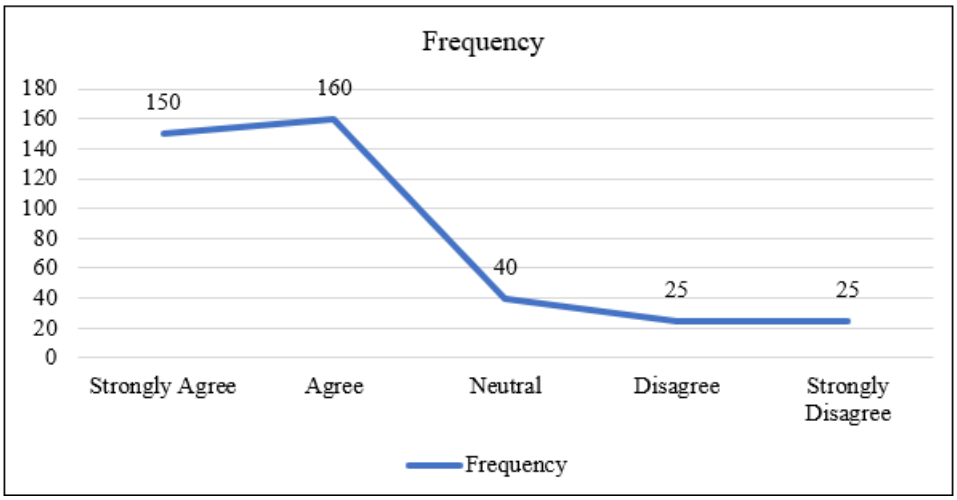

Figure 5: I believe that the interactive nature of e-games can make exercise more enjoyable and accessible.
Source: author's compilation

Figure 5 represents respondents' opinions on the statement "I believe that the interactive nature of e-games can make exercise more enjoyable and accessible. " The data shows that 150 respondents (37.5%) strongly agree and 160 (40%) agree with this statement, indicating a significant majority perceive e-games as potentially enhancing the enjoyment and accessibility of exercise. Additionally, 40 individuals (10%) are neutral, suggesting a moderate portion of respondents are unsure about this relationship. Only 25 respondents (6.25%) disagree and another 25 (6.25%) strongly disagree, indicating a smaller percentage of respondents hold negative views about e-games improving exercise enjoyment and accessibility. Overall, the data suggests a prevailing belief among respondents that e-games can positively impact exercise experience.

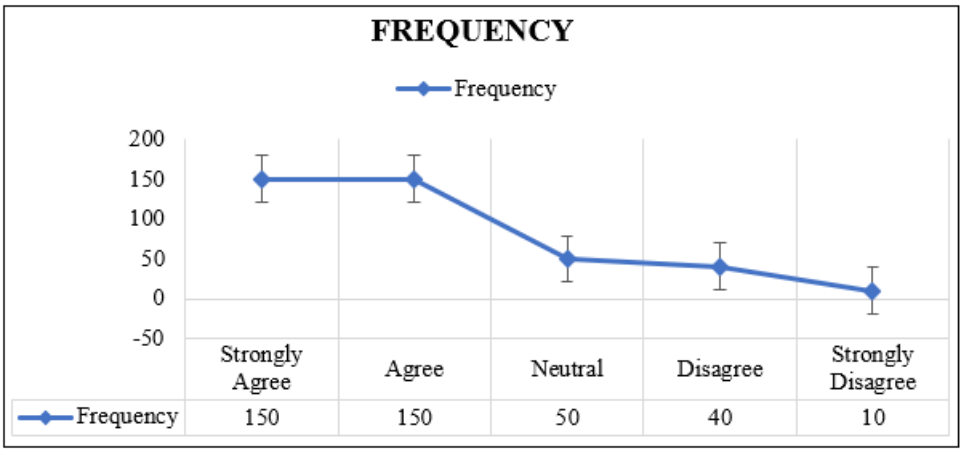

Figure 6: I believe that e-gaming can increase physical activity levels, especially in populations less inclined to traditional exercise
Source: Researcher's calculations

Figure 6 illustrates respondents' beliefs regarding the statement "I believe that e-gaming can increase physical activity levels, especially in populations less inclined to traditional exercise. " The data indicates that 150 respondents (37.5%) strongly agree and another 150 (37.5%) agree with this statement, suggesting a substantial majority perceive e-gaming as potentially boosting physical activity, particularly among groups less inclined towards conventional forms of exercise. Additionally, 50 respondents (12.5%) are neutral, indicating a moderate proportion are undecided about this relationship. A smaller percentage of respondents, 40 (10%) disagree and 10 (2.5%) strongly disagree, suggesting a minority hold negative views on the impact of e-gaming on physical activity levels. Overall, the data suggests a prevalent belief among respondents that e-gaming can positively influence physical activity levels, especially among those less inclined to traditional exercise.

5. Conclusion and suggestions

The study offers valuable insights into junior high school students' varied perceptions regarding how e-gaming affects their sports performance. While the self-reported data has limitations, it provides initial clues for further investigation and emphasizes the importance of a nuanced understanding of this relationship.

Positive Views
Health Benefits: A considerable number of respondents believe e-gaming can positively affect physical health (42.5% strongly agree, 37.5% agree) and mental well-being (32.5% strongly agree, 42.5% agree), suggesting potential benefits for physical fitness, mood enhancement, and stress relief. However, more research with objective measures is necessary to confirm these beliefs.

Engagement and Accessibility: The data indicates a positive perception of e-gaming as a fun and engaging way to promote physical activity (25% strongly agree, 40% agree) and enhance the enjoyment and accessibility of exercise (37.5% strongly agree, 40% agree). This suggests that e-gaming could attract individuals who are hesitant about traditional exercise, but controlled studies are required to validate its effectiveness in increasing physical activity levels.

Targeted Populations: A significant majority (37.5% strongly agree, 37.5% agree) believe e-gaming can boost physical activity levels, particularly among those less inclined to traditional exercise. This suggests potential benefits for promoting physical activity among specific populations, but further research is needed to understand the mechanisms and tailor interventions accordingly.

Neutral and Negative Views
Mixed Opinions: Despite positive perceptions, a notable proportion of respondents remain neutral or skeptical about e-gaming's impact on physical health, mental health, and its effectiveness in promoting physical activity. This underscores the need for further research to address these concerns and provide more conclusive evidence.

Potential Drawbacks: Some respondents express disagreement or strong disagreement with certain positive statements, indicating potential negative effects such as addiction, sedentary behavior, or exposure to inappropriate content. This highlights the importance of responsible e-gaming practices and parental guidance.

6. Limitations and Suggestions for Future Research

Self-Reported Data: The study relies on self-reported perceptions, which can be subjective and biased. Future research should incorporate objective measures of sports performance, physical health, and mental health to assess the actual impact of e-gaming.

Specific E-games: The study lacks information about the specific types and content of e-games played by the respondents. Future research should analyze how different e-games influence perceived and actual outcomes.

Moderating Factors: Individual differences in personality, exercise preferences, socioeconomic background, and access to technology might influence the impact of e-gaming. Future research should explore these factors to understand how e-gaming affects different individuals.

Guidelines for Responsible Gaming: Further research and development are needed to create evidence-based guidelines for responsible e-gaming practices, especially when integrated into sports training or physical activity programs, considering potential risks, and maximizing benefits for different age groups and individual needs.

References

[1] Dindar, M. (2018). An empirical study on gender, video game play, academic success and complex problem-solving skills. *Computers & Education*, *125*, 39-52.
[2] Gao, Z., & Chen, S. (2014). Are field-based exergames useful in preventing childhood obesity? A systematic review. *Obesity Reviews*, *15* (8), 676-691.
[3] Goundar, R. (2015). *Physical activity, screen-based behaviours and obesity among Fijian adolescents* (Doctoral dissertation, Deakin University).
[4] Lemay, A., Dufour, M., Goyette, M., & Berbiche, D. (2024). ESport programs in high school: what's at play? *Frontiers in Psychiatry*, *15*, 1306450.
[5] Liang, Y., & Lau, P. W. (2014). Effects of active videogames on physical activity and related outcomes among healthy children: A systematic review. *GAMES FOR HEALTH: Research, Development, and Clinical Applications*, *3* (3), 122-144.
[6] Neset, T. S., Andersson, L., Uhrqvist, O., & Navarra, C. (2020). Serious gaming for climate adaptation—Assessing the potential and challenges of a digital serious game for urban climate adaptation. *Sustainability*, *12* (5), 1789.
[7] Norris, E., Hamer, M., & Stamatakis, E. (2016). Active video games in schools and effects on physical activity and health: a systematic review. *The Journal of pediatrics*, *172*, 40-46.
[8] Pellas, N., Mystakidis, S., & Christopoulos, A. (2021). A systematic literature review on the user experience design for game-based interventions via 3D virtual worlds in K-12 education. *Multimodal Technologies and Interaction*, *5* (6), 28.
[9] Pelletier, V. H., Lessard, A., Piché, F., Tétreau, C., & Descarreaux, M. (2020). Video games and their associations with physical health: A scoping review. *BMJ open sport & exercise medicine*, *6* (1), e000832.
[10] Poonam, Anshita, & Chhikara, K. S. (2022). Fintech and Financial Inclusion: A Bibliometric Analysis. *MANTHAN: Journal of Commerce and Management*, *9* (2), 121–144. https: //doi. org/10.17492/jpi. manthan. v9i2.922207
[11] Rathee, A., Barak, A., Solanki, P., & Rathee, M. (2023). Banking Services and Financial Inclusion : A Bibliometric Journey from 2004 to 2022 Using PRISMA Guidelines. *International Journal of Research and Analytical Reviews (IJRAR), 10* (4), 390–404. https: //doi. org/10.5281/zenodo.10033232
[12] Solanki, P., & Chhikara, K. S. (2023). Constraints to the promotion of financial inclusion in India : an empirical study of implementing agencies under Pradhan Mantri MUDRA Yojana. *International Journal of Social Economics*. https: //doi. org/10.1108/IJSE-06-2023-0462
[13] Schade, S., Mahoney, J., Spotts, A., Greenauer, N., & Veerabhadrappa, P. (2020). Pokémon Go did not increase step count or distance travelled among college students. *Human Movement*, *21* (2), 64-70.