Exploring the Current Status of e-sports Participation among People with Disabilities in South Korea

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Abstract

This study aimed to investigate the current state of E-sports for people with disabilities and provide suggestions for future development in this field. A total of 243 people with disabilities completed a paper-pencil questionnaire, which assessed their participation in E-sports and experiences during participation. The results showed that 44.6% of the respondents participated in e-sports activities. The main reasons for participating were 'fun' and 'to relieve stress'. Respondents mostly played in their own facilities, followed by public and school facilities, with PC games being the most popular genre. The favorite e-sports events were 'Nintendo Wii', 'GoStop', 'FIFA Online', and others. Respondents mostly played 1-2 times a week. This study proposes the cultivation of inclusivity, prioritizing enjoyment and entertainment as primary motivators, and augmenting the accessibility of gaming facilities and equipment through the integration of assistive technologies for future advancements. Overall, the study provides insights into the current status of e-sports use by people with disabilities and offers tangible directions for future improvements, aiming to make e-sports participation more accessible and inclusive.

Keywords: accessibility, disabled individuals, e-sports, inclusion, participation, PC games

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Introduction

E-sports, a competitive activity using video games, has gained immense popularity as a form of leisure that requires mental and physical abilities to compete in an electronic environment that simulates the real world. With the advent of technologies like augmented reality (AR) and virtual reality (VR), e-sports have expanded to include games and activities involving both direct and indirect physical activities (Park et al., 2019a). The e-sports industry has undergone significant growth and development in recent years and has become a major industry that encompasses players, club companies, and spectators similar to traditional sports (Jenny et al., 2017; Newzoo, 2021; Park et al., 2019a).

It is important to note that e-sports has a low entry barrier, making it accessible for anyone to enjoy anytime and anywhere. Therefore, it can serve as an alternative to traditional sports activities for people with disabilities who are restricted from participating in physical sports (Park et al., 2019b). Further, e-sports competitions are relatively easy for people with disabilities to participate in and compete, and it has a positive impact on self-confidence, self-esteem, social skills, and motivation to overcome disabilities. Research indicates that children with different disabilities, such as autism spectrum disorder, cerebral palsy, and traumatic brain injury, can benefit from participating in e-sports by improving their cognitive, physical, and emotional abilities (Conception, 2017). These engagements can also yield positive outcomes for their self-assurance and social maturation, as highlighted in investigations conducted by Kim et al. (2012) and Raggiotto & Scarpi (2022).

However, e-sports for people with disabilities currently faces various problems. Firstly, in terms of the type of sport, there is a lack of e-sports events that consider the characteristics of people with disabilities. Therefore, it is necessary to have e-sports events that cater to these characteristics (Park et al., 2019). Additionally, when it comes to facilities and equipment, people with disabilities encounter challenges in experiencing e-sports activities comfortably and conveniently, primarily due to the insufficient availability of suitable provisions. It is surprising that the six-disability e-sports competitions held in Korea have only taken place in four e-sports exclusive stadiums located in Seoul. This can be attributed to a lack of physical equipment and accessibility issues for people with disabilities, highlighting the problems of disability e-sports stadiums (Conceptuion, 2017).

Despite the advantages of e-sports for people with disabilities, there is a lack of facilities, equipment and policies that enable them to experience and enjoy e-sports. Furthermore, there is a shortage of research on this topic (Heere, 2018; Park et al., 2019a). Therefore, this study systematically analyzes e-sports participation trends among people with disabilities, aiming to enhance their engagement in this context. It seeks to uncover current patterns, pinpoint areas for enhancement, and propose future development strategies. By establishing a comprehensive understanding of the present state of e-sports activities for people with disabilities, we hope that this research lays the groundwork for their further advancement in the field.

Literature Review

Definition of E-sports for People with disabilities

The definition of e-sports for the people with disabilities is based on the concept of sports played through video games. E-sports is a leisure activity that involves mental and physical abilities to compete, including elements such as competition and playfulness in a virtual environment similar to the real world (Hallmann & Giel, 2018; Taylor, 2016). E-sports competitions are held on digital platforms, and anyone can participate with the use of the Internet, PC, or smartphone without designated places and equipment like general sports (Heere, 2018). Therefore, e-sports can serve as an alternative to traditional sports activities for people with disabilities who may have limitations in participating in sports (Cunningham et al., 2018). Grounded upon the traditional definition of e-sports, e-sports for the people with disabilities can be defined as a sport in which people with disabilities compete through games using computers and other equipment, grouped by disability grade and event under physical and mental conditions (Park, 2019). Moreover, e-sports for the people with disabilities can be seen as total activities that promote the intellectual, physical, and social skills of people with disabilities through sports activities mediated by electronic contents. (Park et al., 2019b; Choi & Hwang, 2021).

Research on E-sports for People with Disabilities in Korea and Abroad

In 2019, Park et al. analyzed the current situation and status of e-sports among people with disabilities to provide foundational data for future enhancement. Interestingly they found that the main reasons individuals with disabilities engage in e-sports activities are due to the enjoyment derived from both direct engagement in eSports and indirect experiences through media exposure. The pivotal role of friends and siblings in initiating eSports participation was also confirmed. Additionally, the most significant challenge faced by people with disabilities during e-sports activities is the lack of relevant programs and inconvenient facility and equipment use. Further, participants with disabilities exhibited high levels of satisfaction with their activities, yet satisfaction levels were relatively lower in terms of facility and event experience aspects. Crucially, the participants voiced a compelling need for accessible facilities and disability-friendly equipment, alongside a desire for games that could be equally enjoyed by both people with disabilities and those without disabilities. These insights not only emphasize the prevailing disparities but also underscore the imperative for holistic enhancements across various facets of the e-sports ecosystem to truly empower people with disabilities within this dynamic realm.

Regarding the dissemination of e-sports education programs, a mere 16% of the nationwide count of 177 special schools, totaling 29 establishments, currently offer such initiatives. Among these,

approximately half, or 84 schools, actively engage in e-sports competitions, irrespective of their educational activities (Park, 2019). Choi and Hwang (2021) postulate that e-sports, marked by its accessible entry points for people with disabilities and the feasibility of remote play, stands as a viable communication channel for those with limited mobility due to societal shifts such as the COVID-19 pandemic. Their research notably unveils e-sports as a potential avenue for a novel form of sports welfare, affording people with disabilities new experiences and the restoration of self-assurance in their daily lives. Furthermore, stress alleviation emerged as a prominent incentive for people with disabilities to participants in e-sports, underscoring the heightened stress and challenges faced by this demographic during the pandemic. The authors advocate for a gradual integration of e-sports for the people with disabilities, suggesting the incorporation of a dedicated segment within existing e-sports competitions rather than establishing segregated tournaments.

Mosely et al. (2022) conducted an online survey spanning from 2017 to 2021, targeting 1,106 American adults with disabilities who engage in e-sports. They primarily identified the platforms predominantly used. The results indicated that among the respondents, 31.4% utilized a combination of smartphones, computers, and console devices (such as Xbox and Nintendo). The breakdown of platform usage revealed that 17.4% employed smartphones and computers, 13.8% utilized smartphones and console devices, and 7.2% employed computers in conjunction with console devices. Further, A survey conducted by the Crawford Research Institute in the United States aimed to determine the preferred types of e-games among individuals with disabilities. This study surveyed 402 individuals with disabilities, focusing on a rehabilitation hospital in the state of Georgia (Thompson et al., 2021). The preferences for various types of e-games were analyzed, categorized by the nature of disabilities. Irrespective of the type of disability, Word Game (26.7%) emerged as the most preferred choice. Among people with visual impairments, Other Game (28.1%), which wasn't explicitly listed as an option, was the top preference, followed by Word Game (24.6%), and Role Playing and Action (8.8%). People with hearing impairments favored Role Playing and Word Game (25%) the most, with Action Game (16.7%) being their third preferred genre. Those with learning and anxiety disorders displayed a preference for Role Playing, following Word Game and Other Game. The least favored genres included Exergame, Virtual Reality, and Battle Royale. Sport Game was also less preferred compared to other genres; however, it exhibited the highest preference among individuals with visual impairments.

Method

Participants

Of the total 249 copies of the data, 44.6% people with disabilities participated in e-sports, and 55.4% people with disabilities did not participate in e-sports. It was confirmed that the average age of the study participants was 42.56 years old (SD = 18.14). As a result of examining the types of disabilities of the participants, 47.0% were found to have physical disabilities, 19.7% were intellectual disabilities, and 15.3% were brain lesions. In addition, 43.0% graduated from high school, 14.9% graduated from university, and 5.2% graduated from graduate school or higher, accounting for 20.1% of participants with a level of education above university. Their income levels were 29.3% with no income, 21.7% with less than 1 million won, 24.1% with 1.01-2 million won, 7.6% with 2.01-3 million won, 6.0% with 3.01-4 million won, and 2.8% with 4.01-5 million won 2.8%, and more than 5.01 million won (8.3%). The demographic characteristics of these study participants are shown in the following table.

Table 1. Demographic characteristics of survey participants

Category	Sortation	N	%
Participation status	Participation	111	44.6
	Not participated	138	55.4
Gender	Male	156	62.7
	Female	87	34.9
Education	Below middle school graduation	12	4.8
	Middle school student	11	4.4
	A high school student	23	9.2
	High school graduation	107	43.0
	A college dropout	33	13.3
	Graduation from university	37	14.9
	A graduate student	5	2.0
	A master's/doctor's degree	8	3.2
	Graduated from a special school major	5	2.0
Occurrence time	Before birth	37	14.9
	After birth	183	73.5

Category	Sortation	N	%
Disability type	A physical disability	117	47.0
	A brain lesion disorder	38	15.3
	A visual impairment	10	4.0
	Hearing impairment	6	2.4
	A speech impediment	2	0.8
	Intellectual disability	49	19.7
	Autistic disorder	10	4.0
	Kidney failure	2	0.8
	A facial disorder	1	0.4
	Epileptic disorder	1	0.4
Average monthly income	No Income	73	29.3
	Less than KRW 1 million	54	21.7
	KRW 1.01 – 2 million	60	24.1
	KRW 2.01 – 3 million	19	7.6
	KRW 3.01 – 4 million	15	6.0
	KRW 4.01 – 5 million	7	2.8
	More than KRW 5.01 million	8	3.2
Occupation	A managerial position	8	3.2
	Professional occupation	23	9.2
	Clerical work	20	8.0
	A service job	8	3.2
	A simple labor job	54	21.7
	Student	84	36.2
	Other	84	36.2

Instrument

The survey comprehensively investigates diverse dimensions of e-sports participation among people with disabilities and their associated accessibility considerations. The questionnaire is structured into three primary categories: participation, content, and accessibility (Table 2). Specifically, it encompasses

queries about participants' frequency of engagement and motivating factors in e-sports, and the venues where they actively participate (participation; 4 questions), their genre preferences and favorite e-sports (contents; 2 questions). Furthermore, the survey delves into the hurdles and inconveniences encountered by participants, the challenges impacting their involvement, the essential resources needed for participation, and the strategies employed to access e-sports information (accessibility; 4 questions).

Table 2. Survey questionnaire

Category	Questions	Number
Participation	Participation in esports	1
	Frequency of e-sports participation	2
	Reason for the participation	3
	e-sports participation spaces	4
Contents	e-sport genres	5
	Favorite esports	6
Accessibility	Causes of inconvenience	7
	Difficulties related to participation	8
	Necessary resources for participation	9
	The path to acquiring e-sport information	10
Personal background		11-18
Total number of questions		18

Procedure

To establish fundamental data for identifying the current status of e-sports participation among people with disabilities, this study undertook a comprehensive survey involving people with disabilities. The primary aim was to gather essential insights that could inform future activation strategies. The outcomes of this analysis are intended to serve as foundational data for shaping recommendations in this realm. The survey targeted a specific demographic—people with disabilities participating in disability-oriented welfare centers, sports clubs, and e-sports tournaments within the Seoul/Gyeonggi region. To achieve the study's objectives, a team of three trained research assistants conducted on-site visits to these welfare centers, sports clubs, and competitions catering to people with disabilities.

Utilizing a self-administered questionnaire approach, participants were invited to provide their perspectives on various facets of e-sports participation. Regarding people with visual and hearing impairments, and developmental disabilities, we worked closely with caregivers, specialized educators, and support personnel to create a comfortable environment for data collection.

Data analysis

The data analysis involved several steps. First, a frequency analysis was conducted to determine the general characteristics of the research subjects. Second, a descriptive statistical analysis was performed to identify the general tendency of each measurement variable and the normality of the data (Kline, 2011).

Results

Accessibility Landscape within Disability Welfare Centers

This investigation encompassed a survey of 254 welfare centers in Korea to evaluate the integration of e-sports facilities and programs tailored for people with disabilities (Table 3). The sample was derived from the initial pool of 254 centers across the country, with a total of 244 centers included after accounting for cancellations and non-responses (N = 10). Employing a phone-based survey methodology, the study sought answers to two central inquiries: the presence of 1) e-sports facilities; 2) and e-sports programs. The findings unveiled that 15% of the welfare centers featured e-sports facilities, encompassing spaces like video game rooms housing platforms such as Nintendo Switch and Xbox (32%). Furthermore, 21% of the centers extended their offerings to encompass digital development training with Virtual Reality (VR) rooms, and an additional 16% provided computer-based 'information classes'. Notably, despite possessing e-sports facilities, 32 welfare centers were concurrently conducting e-sports programs, highlighting that facility availability did not invariably align with active program engagement. This divergence from historical practices was evident as certain centers discontinued their e-sports program offerings. Among those presently providing e-sports programs (25%), video game-centric initiatives utilizing Nintendo and Xbox gained popularity, and eight programs incorporating VR technology also integrated video games.

Table 3. Status of e-sports facilities in welfare centers for the people with disabilities

	A total N of welfare center	The welfare centers with e-sports facilities		The welfare centers with e-sports program	
		N	%	N	%
Seoul	47	6	12.8	7	14.9
Busan	17	1	5.9	2	11.8
Daegu	6	1	16.7	2	20.0
Incheon	10	2	20.0	2	20.0
Gwangju	6	2	33.3	1	16.7
Daejeon	7	0	0.0	0	0.0
Sejong	1	0	0.0	0	0.0
Ulsan	3	0	0.0	0	0.0
Gyeonggi	34	7	20.6	5	14.7
Gangwon	10	2	20.0	1	10.0
Chungbuk	13	2	15.4	1	7.7
Chungnam	16	3	18.8	2	12.5
Jeonbuk	13	2	15.4	1	7.7
Jeonnam	17	2	11.8	2	11.8
Gyeongbuk	21	2	9.5	2	9.5
Gyeonnam	18	5	27.8	5	27.8
Jeju	5	1	20.0	1	20.0
Total	244	38	15.6	32	13.1

Participation in e-sports

The study aimed to comprehend the extent of participation of people with disabilities engagement in e-sports through a conducted survey. The initial phase assessed the e-sports participation of people with disabilities, yielding the subsequent analysis outcomes (Table 4). A majority of respondents (55.4%) indicated no prior involvement in e-sports activities, while a significant proportion (44.6%) reported their participation. Furthermore, assessing the frequency of respondents' engagement in

e-sports revealed that 55.9% participated 1-2 times a week, while 19.8% participated 3-4 times, and 17.1% engaged daily. The analysis results of reasons for engaging in e-sports were ranked based on multiple responses and assigned weights (3 points for the top-ranked response, 2 points for the second, and 1 point for the third) Notably, 'It's fun' held the highest percentage at 27.6%, closely followed by 'To relieve stress' at 26.2%. 'Playing games with friends and acquaintances' and 'Passing time' garnered 13.3% and 12.9% respectively. Regarding the spaces where people with disabilities predominantly engaged in e-sports activities, personal facilities constituted the highest percentage at 47.3%. This was followed by 'Public facilities' (26.4%) and 'School facilities' (20.0%), respectively

Table 4. Result from the participation in e-sports questionnaire

Rank	Category	Options	N	%
	Participation in e-sports	Yes	111	44.6
		No	138	55.4
1	Frequency	1-2 times a week	62	55.9
2		3-4 times a week	22	19.8
3		Everyday	19	17.1
4		5-6 times a week	8	7.2
1	Reasons for e-sports participation	It's fun	154	27.6%
2		To relieve stress	146	26.2
3		To play with friends and acquaintances	74	13.3
4		To interact and compete with others online	36	6.5%
5		Other	32	5.7
6		To participate in the competition as a player	28	5.0
7		To show my record/character to others	16	2.9
1	e-sports participation places	One's own facilities	52	47.3
2		Public facilities	29	26.4
3		School facilities	22	20.0
4		Private facilities	6	5.5
5		Other	1	0.9

Contents

The inquiry into e-sports content encompassed participants' engagement in specific e-sports genres and their preferences for favorite e-sports events. Regarding e-sports genres, the breakdown of participant involvement is illustrated in]. Notably, 'PC games' emerged as the most prevalent category, constituting 42.3% of participation, followed by 'Mobile games' at 36.0. However, 'Console Games', 'Other', and 'Virtual Reality (VR) Games' exhibited comparably lower figures, accounting for 16.2%, 3.6%, and 1.8% respectively.

Table 5. Result from the participants' engagement in specific e-sports genres

Rank	Category	Option	N	%
1	e-sports genre	PC games (MMORPG, Go/Poker, Board games, etc.)	47	42.3
2		Mobile games (games used through smartphones and tablet PCs)	40	36.0
3		Console games (PlayStation, X-BOX, PS vita, Nintendo Switch, etc.)	18	16.2
4		Other	4	3.6
5		Virtual Reality (VR) Games	2	1.8

Turning to favored e-sports events, the outcomes of the investigation are presented in Table 6. Notably, 'Nintendo Wii' garnered the highest percentage at 15.5%, followed by 'GoStop' (11.7%), 'FIFA Online' (8.7%), and 'Other' options (7.3%). Additional preferences encompassed 'Kartrider' (6.8%), 'Battleground' (5.3%), 'League of Legend' (5.3%), 'Modoo Marble' (5.3%), and 'Starcraft' (4.4%).

Table 6. Result from the participants' favorite e-sports events

Rank	Category	Option	N	%
1	Favorite e-sports	Nintendo WII	32	15.5
2		GoStop	24	11.7
3		FIFA Online	18	8.7
4		Other	15	7.3
5		Kartrider	14	6.8

Rank	Category	Option	N	%
6		Battleground	11	5.3
		League of Legend	11	5.3
		Modoo Marble	11	5.3
9		Starcraft	9	4.4
		Sachunsung	9	4.4
11		Janggi	8	3.9
12		GO	6	2.9
		Others	6	2.9
14		MaguMagu	5	2.4
15		Crazy Arcade	4	1.9
		Maple Story	4	1.9
		Starcraft 2	4	1.9
18		Overwarch	3	1.5
		Sudden Attack	3	1.5
		Lineage	3	1.5
21		Poker	2	0.9
		Taled Runner	2	0.9
		Catchmind	2	0.9

Accessibility

Addressing accessibility considerations, our survey encompassed participants' perspectives on sources of inconvenience in e-sport participation, encountered difficulties in engaging in e-sports, essential resources for accessing e-sports facilities, and avenues for obtaining e-sports-related information (Table 7). In relation to the causes of inconvenience in e-sports participation, 31.6% identified 'issues with disabled mobility equipment (e.g., wheelchairs)' as the most prominent factor. This was trailed by 'Other' reasons (26.5%), largely stemming from participants who hadn't utilized

private facilities such as PC rooms, as well as 'Cramped PC room space' (17.6%), 'Moving difficulties to PC rooms' (15.4%), and 'Elevator inconvenience in PC room buildings' (8.8%). Turning to difficulties encountered during e-sport participation, 'Time constraints due to current work or study' led with 16.5%, trailed by 'Absence of disabled-friendly e-sport programs' (15.3%), 'Cost-related burdens' (14.2%), 'Social bias and insufficient consideration for people with disabilities' (11.9%), 'Inadequate e-sport facilities' (11.0%), 'Challenges in finding participation-related information' (10.4%), 'Lack of companions' (8.3%), 'Difficulties stemming from personal disability characteristics' (8.3%), and 'Other' factors (4.1%).

Investigating the essential resources for utilizing e-sports facilities, the analysis outcomes, obtained via a ranked multiple response approach and weighting, indicated that 'Proximity' held the highest significance with 103 points (17.4%). Additionally, 'Elevator/wheelchair accessibility', 'Accessible entrances', and 'Mobility-friendly passages' garnered similar scores of 16.4%, 15.3%, and 14.0% respectively. Lastly, when tracing avenues for acquiring e-sports information, the most prevalent source was the 'Internet' (50.0%), closely followed by 'Family and acquaintances/friends' (23.6%).

Table 7. Result from the accessibility issues related to e-sports for people with disabilities

Rank	Category	Options	N	%
1	Causes of inconvenience in e-sports participation	Issues with disabled mobility equipment (e.g., wheelchairs)	43	31.6
2		Other	36	26.5
3		Cramped PC room space	24	17.6
4		Moving difficulties to PC room	21	15.4
5		Elevator inconvenience in PC room buildings	12	8.8
1	Challenges in e-sports Engagement	Time constraints due to work/study	92	16.5
2		Lack of disabled-friendly programs	85	15.3
3		Cost-related burdens	79	14.2
4		Social bias and neglect	66	11.9
5		Inadequate e-sports facilities	61	11.0
6		Difficulty finding participation info	58	10.4
7		Lack of companionship	46	8.3
8		Disability-specific participation challenges	46	8.3

1	Essential Resources for Facility Access	Proximity	23	4.1
2		Elevator/wheelchair accessibility	97	16.4
3		Accessible entrance	91	15.3
4		Mobility-friendly passages	83	14.0
5		Disabled parking	64	10.8
6		Adapted gear	60	10.1
7		Support for facility visits (Activity assistants, call taxis etc.)	49	8.4
8		Accessible changing rooms	37	6.2
9		Other	9	1.5
1	Acquiring E-sports Information Path	Internet	55	50.0
2		family and acquaintances/friends	26	23.6
3		School guidance	9	8.2
4		Other	9	8.2
5		The mass media	6	5.5
6		A local/neighborhood press	5	4.5

Discussion

The main objective of this study was to investigate the current status of e-sport participation among people with disabilities, who are the actual consumers of e-sports for people with disabilities. By understanding the current state of e-sports participation among this population, the industry can identify areas for improvement and develop strategies to make e-sports more inclusive and accessible.

First, the study's findings show a significant degree of participation in e-sports activities among people with impairments. Nonetheless, a sizable majority of respondents acknowledged a lack of interest in such activities. This disparity stimulates thought about probable variables causing this divergence. One probable explanation is that there is a lack of awareness or access options for people with disabilities in the e-sports realm (Choi & Hwang, 2021; Park et al., 2019b). The disparity in participation rates could be attributed to a lack of awareness and restricted promotional activities (Lee et al., 2022). Furthermore, the presence of significant impediments, such as accessibility concerns and insufficient support systems, may operate as significant deterrents to involvement, echoing prior

research findings (Kim, 2022; Park, 2019). The consequences of these findings are far-reaching, emphasizing the critical need for targeted interventions aimed at increasing the inclusion of e-sports.Based on the findings of the study, it is clear that increasing awareness through focused efforts is a critical step in closing the participation gap. Furthermore, a comprehensive approach is required, which includes the creation of equal opportunities as well as accessible facilities adapted to the needs of people with disabilities. This is consistent with prior research, which has highlighted the importance of such measures in fostering participation and breaking down barriers (Park et al., 2019a).

The study's findings have also revealed the insights into the reasons that drive e-sports participants among people with disabilities. The pure enjoyment received from e-sports activities was clearly the most powerful motivator among participants, consistent with Park et al.'s study (2019b). This emphasizes the importance of entertainment and pleasure as motivators for people with impairments to participate in e-sports. The pursuit of stress alleviation was a close second, showing that e-sports activities could potentially serve as an effective route for stress management within this group. Furthermore, a significant percentage of respondents cited engagement with friends and acquaintances as a driver for their participation, emphasizing the importance of social relationships and peer encouragement in developing e-sports participation. Significantly, the proclivity of some players to socialize and compete with strangers online highlights the broader social potential of e-sports activities (Kim et al., 2012). E-sports, as a virtual environment, provide a platform for social involvement that extends beyond one's immediate social circle, potentially developing new relationships and interactions (Raggiotto & Scarpi, 2022). Notably, the data revealed that some respondents participated in e-sports activities in order to compete in tournaments and demonstrate their gaming prowess and successes. This underlines the potential of e-sports to provide paths for personal achievement and recognition, emphasizing the importance of these activities for people with disabilities.

Moreover, the study's findings highlight the popularity of PC and mobile games as favored e-sports genres among people with disabilities. This significant revelation has practical ramifications for e-sports groups and venues seeking to successfully accommodate the impaired community. These organizations can increase inclusion through customized equipment and facilities by aligning their offers with the current preference for PC and mobile gaming (Beeston et al., 2018). Furthermore, this discovery has implications for game producers, indicating a potential to create games that are more accessible and accommodating to those with disabilities. Such efforts would not only cater to their specific demands, but would also resonate with their preferences, potentially increasing the reach of these games among the target audience.

According to the findings of this study, accessibility is a significant concern for persons with disabilities who participate in e-sports activities at private facilities such as PC rooms. The most

common cause of annoyance was connected to mobility facilities and impaired equipment, followed by the restricted space in PC rooms and the inconvenience of traveling to the PC room, underlining the need for better accessible facilities, equipment, and accommodations (Beeston et al., 2018; Park, 2019). Lee's report (2018) on social activities for people with disabilities reported that 49.7% of people with individuals experience discomfort with engaging in social activities. This discomfort primarily stems from the inadequate availability of convenience facilities tailored to disabilities, consequently limiting their participation in external activities (Kwon, 2020). As a result, there is a crucial need to prioritize the expansion of physical convenience facilities that can effectively support people with disabilities in their pursuit of e-sports activities.

Building upon these considerations, out findings substantiate the important role of accessibility and convenience in encouraging e-sports participation among people with disabilities. Proximity, accessible entrances, corridors, and passages, elevators, wheelchair lifts, and slopes are among the top needs mentioned. These requirements highlight the importance of physical accessibility in e-sports, which should be taken into account when designing and planning e-sports venues and equipment (Beeston et al., 2018; Park et al., 2019b). Furthermore, the necessity for disabled parking, adapted sports equipment, and assistance in visiting sports venues and equipment emphasizes the importance of complete support systems that take into account the unique needs of people with disabilities. Overall, the findings emphasize the importance of include inclusive design and accessibility considerations in e-sports infrastructure, facilities, and equipment in order to promote improved inclusivity and accessibility for people with disabilities.

Finally, the findings of the study revealed that people with disabilities face a number of challenges when participating in e-sports activities. The three primary challenges noted were a lack of time owing to present work or education commitments, a lack of programs for people with disabilities to participate in e-sports, and a financial burden such as cost. These issues could have a substantial impact on people with disabilities participating in e-sports activities and should be considered when designing policies and initiatives to promote inclusion and accessibility in e-sports.

Practical implications

The study's findings can be used by e-sports organizations, facilities, and equipment to better cater to the needs and preferences of the disabled community. For example, facilities can provide more accessible entrances, corridors, and passages, wheelchair lifts, and slopes to improve physical accessibility for people with disabilities. Additionally, e-sports organizers can schedule events and activities in a way that is more accommodating to the participation patterns of people with disabilities, such as offering events on weekends or during non-peak hours. Additionally, the study can also guide

game developers in creating more accessible and inclusive games for people with disabilities. For example, game developers can include options for players to customize their gaming experience, such as remapping controls, adjusting game speed, or enabling audio descriptions. They can also design games that are easy to play with assistive technology, such as screen readers or switch devices.

Finally, the study's findings can inform policymakers in developing policies and programs aimed at promoting inclusivity and accessibility in e-sports. For example, policymakers can work with e-sports organizations, facilities, and equipment to improve physical accessibility and promote diversity and inclusion in the e-sports community. They can also provide funding and resources to support the development of more accessible games and e-sports facilities.

Conclusion

In conclusion, this study sheds light on the current state of e-sports participation among people with disabilities. The results show that while a significant proportion of the respondents (44.6%) participate in e-sports activities, accessibility remains a significant challenge for those who wish to participate. The study also reveals that the main reasons for participating are 'fun' and 'to relieve stress', highlighting the potential mental health benefits of e-sports for people with disabilities. The study recommends that improvements in physical accessibility and comprehensive support systems be made to promote greater inclusivity and accessibility in e-sports activities. Overall, the findings of this study can inform policies and practices aimed at enhancing the accessibility of e-sports for people with disabilities.

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