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Positive Psychology and Virtual Reality Video Exercise for Special Olympic Indonesia Athletes

Slamet Sukriadi[1], Dicky Reva Apriana Sanga Dwi[2], Muhamad Arif[1], Bazuri Fadilah[1]*

[1]Universitas Negeri Jakarta

[2]Universitas Muhammadiyah Kuningan

*Correspondence: E-mail: slametsukriadi@unj.ac.id

ABSTRACT

This study explored aspects of a good life in Special Olympic Indonesia (SOIna) athletes from a positive psychology perspective, after Virtual Reality video-based trainings. The study assessed aspects used to evaluate the quality of life of SOIna athletes, including life satisfaction, resilience, personal values, and courage. The method used in this study was an experimental method involving experimental and control groups. The experimental group consisted of 40 athletes with mild intellectual disabilities (mean = 23 years) practicing Athletics, Football, Futsal, Handball, and Badminton, while the control group consisted of 40 athletes with mild intellectual disabilities (mean = 24 years) doing sports in their leisure time. Questionnaires were used to measure selected aspects of a good life and well-being. When analyzing the differences between SOIna athletes with disabilities and non-sports athletes with disabilities, a significant difference in resilience was found ($t = 5.25$; $df = 40$; $p < 0.0001$), showing higher resilience traits in athletes with disabilities. The next significant difference in this variable was observed in the comparison between adults with disabilities and healthy adults ($t = -4.15$; $df = 40$; $p < 0.001$). This result indicated higher resilience in healthy adult athletes with disabilities. Healthy young adults did not differ in terms of their resilience levels. Furthermore, differences between non-sports people with disabilities and healthy young adults had not been observed. From the analysis results, the Asymp. sig (2-tailed) value was $0.000 < 0.05$, indicating there was a significant difference and the training using the 360° Virtual Reality Video could be feasible to be used for improving positive psychology in athletes with disabilities (SOIna).

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INTRODUCTION

People with intellectual disabilities are often underestimated by society. However, when their potential is properly explored and supported, they are capable of demonstrating achievements at national and even international levels. One challenge frequently faced by individuals with intellectual disabilities is amotivation toward physical activity. Amotivation refers to a state in which individuals act without intention or lack any intention to act, resulting in minimal or no engagement in activities, including exercise (Saputra et al. 2022). Individuals with intellectual disabilities differ from the general population in terms of cognitive functioning, learning pace, communication skills, and social adaptation. Intellectual disability is characterized by limitations in intellectual functioning and adaptive behavior, with an intelligence quotient (IQ) below 70, and onset occurring before the age of 18. It is classified as a neurodevelopmental disorder and affects approximately 1%–3% of the global population.

The term intellectual disability has officially replaced the previously used term mental retardation following federal legislation (Rosa's Law, Public Law 111–256). In younger children aged zero to five years, the term global developmental delay (GDD) is used to describe significant delays in two or more developmental domains (Purugganan, 2018). Within the diversity that shapes every stage of human life, individuals bring unique characteristics, strengths, and challenges. Children, as the foundation and future of society, often experience diverse developmental trajectories. This reality forms the basis of the psychology of children with special needs, a field that examines the psychological conditions, developmental challenges, and adaptive processes of individuals with atypical development. Understanding these psychological dimensions is essential for designing interventions that promote well-being, resilience, and positive life outcomes for individuals with intellectual disabilities.

These studies lead to an understanding of how psychological training can improve mental resilience and motivation (Saputra et al., 2022). In exploring the psychology of children with special needs, it is essential to begin with a strong conceptual foundation. These individuals, who may experience a wide spectrum of developmental conditions ranging from autism to cognitive impairment, require specific understanding and tailored approaches to ensure that they receive appropriate educational and psychosocial support. Beyond statistical data and medical classifications, there is a deeper narrative that must be acknowledged: children with special needs are active agents in their own developmental journeys. They possess unique potential and talents, although these may require alternative strategies to be fully realized. This perspective forms the core of the Psychology of Children with Special Needs, which emphasizes empathy, understanding, and systematic planning in supporting their growth and development (Nurhayati, 2024). The challenges involved in educating children with special needs cannot be overlooked. Teachers and parents, as primary facilitators in this process, must possess a comprehensive understanding of cognitive, emotional, social, and behavioral aspects to effectively guide these individuals toward optimal development.

Sport can serve as an effective medium for identifying and nurturing the latent talents of individuals with intellectual disabilities. Athletes affiliated with Special Olympics Indonesia (SOIna)—a non-profit organization officially recognized by the Indonesian government and accredited by Special Olympics International (SOI)—engage in structured sports training, competitive events, and a range of non-sport programs designed for individuals with intellectual disabilities or special talents (Indonesia, 2025). Through sustained participation in

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athletic activities, these athletes experience various developmental processes that enable them to express and refine their abilities and talents.

Contrary to enduring societal misconceptions, individuals with intellectual disabilities are not inherently incapable; rather, they have often been stigmatized as intellectually deficient or psychologically unstable. Such misperceptions highlight the critical need to establish safe, inclusive, and supportive environments that allow individuals with intellectual disabilities to develop their potential optimally, particularly given their long history of social marginalization. In response, SOIna actively promotes the participation of athletes with intellectual disabilities in both national and international competitions. These initiatives aim not only to enhance athletic performance but also to increase public awareness of their capabilities and achievements. Participation in competitive sports provides athletes with opportunities to gain recognition, build self-confidence, and challenge prevailing societal stereotypes.

Within this context, positive psychology offers a relevant theoretical framework by emphasizing character strengths, personal virtues, and optimistic perspectives on human potential. This approach underscores the importance of identifying and cultivating individual strengths as pathways to well-being and flourishing. In addition, psychological needs theories contribute valuable insights into human motivation and behavior. Although these theories show substantial promise for advancing behavioral science, ongoing debates persist regarding the nature of psychological needs and their underlying mechanisms. Sheldon and Schüler (2014) proposed a two-process model of psychological needs, conceptualizing them as evolved functional systems comprising (a) innate psychosocial motives that drive adaptive behavior and (b) essential experiential requirements that, when satisfied, enhance adaptive functioning and promote mental well-being. In the context of athletes with intellectual disabilities, fulfilling these psychological needs through structured sports participation and supportive interventions may play a crucial role in fostering resilience, motivation, and overall psychological well-being (Sheldon & Schüler, 2014).

Positive psychology concerns not only the absence of psychological distress but also the presence of subjective well-being as a positive state of functioning (Duckworth, Steen, and Seligman, 2005). Furthermore, life can be viewed from personal and social dimensions, addressing individual happiness as well as societal well-being. This dual approach is essential in happiness research, as emphasized by seligman and diener. Subjective well-being serves an important function by enabling individuals to care for themselves effectively, thereby preventing adverse psychological outcomes such as learned helplessness. One virtue closely associated with positive psychology is courage, which is linked to resilience and is defined as emotional strength and the will to persevere in the face of adversity (Seligman, 2018).

Positive mental health is commonly defined as subjective well-being. Although researchers often seek objective criteria to develop standardized measurement tools, individuals' thoughts and feelings have also been shown to play a crucial role in the study of well-being. Seligman and Diener (2017) emphasize that a primary function of subjective well-being is enabling individuals to care for themselves, which contrasts with the condition of learned helplessness. Child psychology data play an important role in the assessment process. Several elements are considered, including IQ requirements, the ability to understand instructions, and the child's level of independence, in determining eligibility for participation in SOIna. In Indonesia, research in sport psychology and neuroscience has developed substantially; however, studies examining high school athletes' perceptions of their needs for sport

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psychology services remain limited. This study aims to understand young athletes' needs and perceptions regarding sport psychology services (Ahmad, 2022). Motivation in sports performance is a complex phenomenon, as most athletes are driven by multiple forms of motivation, including both extrinsic and intrinsic factors.

Other studies have demonstrated the important role of psychological factors in enhancing athletes' ability to cope with competitive situations. Psychological changes during competition include increased capacity to manage stress, maintain focus, and develop mental toughness, enabling athletes to overcome more demanding challenges (Kliwon and Sarwanto, 2019). One developmental disorder that can occur in children from an early age is a chromosomal abnormality, namely Down syndrome. Down syndrome is the most common chromosomal disorder in newborns. Globally, its incidence ranges from approximately 1 in 600 to 1 in 1,000 births, although this rate varies depending on maternal age at childbirth. Among mothers who give birth at the age of over 45 years, the incidence may reach 1 in 30 births. Currently, there are around eight million individuals with Down syndrome worldwide, while in Indonesia there are more than 300,000 children with Down syndrome (Anggreni and Valentina, 2015).

Therefore, psychological support for athletes with mild intellectual disabilities is highly necessary, particularly in enhancing motivation during training and competition. Training athletes with mild intellectual disabilities requires not only an understanding of individual characteristics but also persistence and creativity in coaching and athlete development. Psychological training conducted gradually, with the support of Virtual Reality (VR) videos, aims to enable athletes to move, imitate, and follow the steps presented in the virtual environment. VR videos can rotate 360 degrees, allowing athletes who use VR Box devices embedded in goggles to interact digitally and follow instructions to complete specific tasks. In the context of field simulation exercises, this method allows children with Down syndrome to express creativity through virtual reality. The objective of this study is to analyze the impact of Virtual Reality video–based training on aspects of a good life in Special Olympics Indonesia (SOIna) athletes from a positive psychology perspective.

METHODS

Research Design

This study employed a training simulation method involving several types of sports movements, such as running, dodging, and shifting, using 360° Virtual Reality (VR) video technology. Figure 1 presents an illustration of the field training simulation using 360° virtual reality video.

Figure 2. Field Training Simulations Using 360° Virtual Reality Video

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The training was conducted intensively every three weeks over a three-month research period. The movement characteristics practiced included running, moving, shifting, and other basic locomotor activities. In addition to the physical simulation, psychological data were collected using a survey method.

The selection of measurement instruments was based on strong theoretical foundations, established psychometric properties, and relevance to the constructs examined in this study. The You and Your Life Survey developed by Jelonkiewicz, Kühn-Dymecka, and Zwoliński was used to assess psychological functioning and well-being. This instrument captures four core domains: self-perception, perception of one's future, personal qualities, and structured lifestyle.

Resilience was assessed using the Polish adaptation of the Resilience Scale for Adults (RSA) developed by Friborg et al., which provides a multidimensional assessment of coping resources and flexibility central to positive adaptation. The RSA also includes two additional components, namely social competence and family coherence. In this adaptation, resilience is conceptualized not as a stable trait, but rather as an ego-related capacity activated in response to stress.

Subjective well-being was measured using the Satisfaction with Life Scale (SWLS) developed by Diener, Emmons, Larson, and Griffin, with the Polish adaptation validated by Juczyński. The SWLS consists of five items reflecting global life satisfaction, rated on a seven-point Likert scale ranging from "strongly disagree" to "strongly agree." The scale demonstrates good reliability, with a Cronbach's alpha of 0.81, and has been shown to correlate positively with self-esteem and self-efficacy.

The Individual Values List (LWO) by Juczyński was used to assess value orientation. This instrument consists of two subscales: symbols of happiness (LWOS), such as social relationships and material conditions, and personal values (LWOW), such as love and wisdom. Respondents rank five items selected from a list of ten according to their perceived importance. Test–retest reliability coefficients ranged from 0.75 to 0.74 after two weeks and from 0.70 to 0.61 after six weeks, indicating acceptable stability.

Personal strengths were measured using the Strength Scale (M–O) developed by Sikorska. In its pilot version, the scale consists of sixteen items grouped into four subscales: perseverance, authenticity, positive thinking, and vitality. Responses are rated on a five-point Likert scale ranging from "strongly agree" to "strongly disagree." Reliability analysis conducted on a sample of 105 participants, including individuals with and without disabilities, yielded a Cronbach's alpha of 0.75. Preliminary statistical analyses indicated that the scale requires further refinement.

Overall, the integration of these instruments allows for a comprehensive and multidimensional assessment of subjective well-being, resilience, values, and personal strengths. This methodological approach strengthens the validity of the study by ensuring alignment between theoretical constructs and culturally adapted measurement tools (Izydorczyk et al., 2019).

The measurement instruments used in this study included the You and Your Life Survey developed by Jelonkiewicz, Kühn-Dymecka, and Zwoliński; the Polish adaptation of the Resilience Scale for Adults (RSA) developed by Friborg et al.; the Satisfaction with Life Scale (SWLS) by Diener, Emmons, Larson, and Griffin, with the Polish adaptation by Juczyński (Izydorczyk et al. 2019); the Individual Values List (LWO) by Juczyński; and the Strength Scale (M–O) by Sikorska. The Polish adaptation of the Resilience Scale for Adults (RSA) was employed to assess resilience. The You and Your Life Survey consists of twenty items and

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covers four dimensions, namely self-perception, perception of one's future, personal qualities, and structured lifestyle.

The RSA also includes two additional components, namely social competence and family coherence. In the Polish adaptation, resilience is conceptualized as an ego-related capacity activated when facing stress, rather than as an innate personality trait. Responses are rated on a five-point scale, ranging from the lowest score to the highest score, with example items such as "My future is very promising" and "I make new friends very easily." The overall scale demonstrates good internal consistency ($\alpha = 0.75$), while selected subscales show Cronbach's alpha values ranging from 0.66 to 0.81. Life satisfaction was measured using the Satisfaction with Life Scale (SWLS) developed by Diener, Emmons, Larson, and Griffin (1985), with the Polish adaptation by Juczyński (2001). This instrument consists of five items that reflect current subjective well-being. Respondents select answers on a seven-point Likert scale, where 1 indicates "strongly disagree" and 7 indicates "strongly agree.".

Example items of the Satisfaction with Life Scale (SWLS) include statements such as "My life conditions are ideal" and "I am satisfied with my life." The SWLS is widely used in research on quality of life and life satisfaction and demonstrates good reliability, with a Cronbach's alpha of 0.81. Previous studies have identified a positive correlation between life satisfaction and self-esteem ($r = 0.56$; RSES) (Gnambs, 2014), as well as between life satisfaction and self-efficacy (Schwarzer et al., 1999).

The Individual Values List (LWO) consists of two subscales: symbols of happiness (LWOS), such as having a wide circle of friends and good financial conditions, and personal values (LWOW), such as love and wisdom. Respondents rank five items selected from a list of ten according to their perceived importance, ranging from the most important (five points) to the least important (one point). Example questions include: "What, in your opinion, determines personal happiness?" with response options such as good health, successful family life, and social recognition. Test–retest reliability over a two-week interval was 0.75 and 0.74 for selected LWO components, and 0.70 and 0.61 after six weeks, indicating acceptable measurement stability.

The Strength Scale (M–O), in its pilot version, consists of sixteen statements grouped into four subscales: perseverance, authenticity, positive thinking, and vitality. Example items include "I view difficult situations as challenges" and "I am full of physical energy." A study involving 105 participants, including both individuals with and without disabilities, was conducted to assess the scale's reliability, yielding a Cronbach's alpha of 0.75. Responses are rated on a five-point Likert scale ranging from "strongly agree" (five points) to "strongly disagree" (one point). Preliminary statistical analyses indicated that further refinement of the instrument is required.

Participants

The population of SOIna athletes consisted of 600 individuals. This experimental study involved two groups. The study group comprised 40 athletes with mild intellectual disabilities (mean age = 23 years) who actively participated in sports training, including athletics, football, futsal, handball, and badminton. The control group consisted of 40 athletes with mild intellectual disabilities (mean age = 24 years) who engaged in sports only as a leisure activity. Questionnaires were administered to assess selected aspects of the good life and well-being.

Sampling Procedures

The sampling technique employed in this study was non-random sampling. This approach involves selecting participants based on specific characteristics or traits in order to obtain a sample that is relevant to the objectives of the study. More specifically, a purposive sampling

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technique was applied, in which participants were selected based on predefined considerations related to particular characteristics or attributes.

Materials and Apparatus

The materials used in this study included 360° virtual reality training videos designed to be viewed in all directions. These videos incorporated movement characteristics such as running, jumping, and shifting, as well as immersive environmental elements that simulate the atmosphere of a real sports field. The training was supported by a virtual reality box equipped with a visual display monitor and earphones connected via Bluetooth 5.0. After all materials and equipment were prepared, the training intervention was implemented with the participants over a period of three months.

Research Procedures

The procedure applied in this study involved training using 360° Virtual Reality (VR) videos delivered through a virtual box device. Participants were provided with training in the form of videos demonstrating running, jumping, walking, and shifting to various positions. This training aimed to develop basic movement skills as well as positive psychological aspects reflected in the behaviors of SOIna athletes during training. In addition, questionnaires were administered to assess the outcomes obtained throughout the training period.

Data Analysis

Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS). The Kolmogorov–Smirnov test with Lilliefors correction was applied to assess the normality of variable distributions. When the data approximated a normal distribution, Student's t-test was used to determine the significance of differences between groups. For data that did not meet the assumption of normality, the Mann–Whitney U test was employed as a nonparametric alternative.

RESULTS

The results addressing the first research question—what are the motives for engaging in sports with the assistance of 360° virtual reality videos, and what is the impact of sports participation on athletes with disabilities?—are presented in this section. The analysis of motives and perceived impacts of sports participation among athletes with disabilities yielded the following findings. The most frequently reported motives for initiating sports participation were the desire to maintain physical fitness and to excel within the SOIna athletes' association while continuing a previously healthy lifestyle (54%). This was followed by encouragement from peers with disabilities (46%), information obtained at treatment centers and encouragement from parents or coaches (17%), and information obtained through the media (12%). Some respondents reported more than one motive.

From the respondents' subjective perspectives, the perceived impacts of sports participation included opportunities to form new friendships within specific sports (93%), increased self-confidence (93%), opportunities to gain new experiences (93%), functioning as a form of mental rehabilitation (85%), and social recognition (35%). Several respondents reported more than one perceived impact. These findings are illustrated in figure 2.

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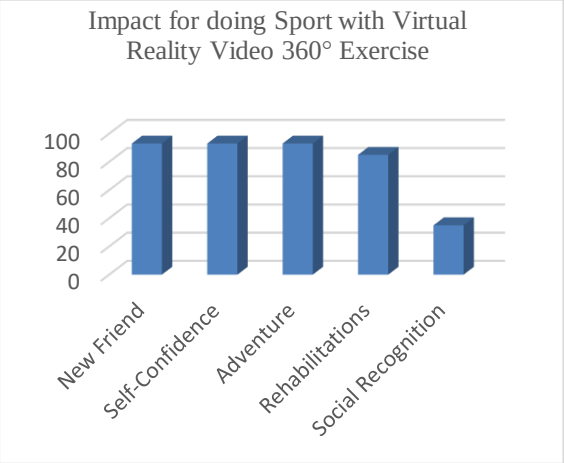

Figure 2. Reasons for and Impacts of Engaging in Sports through 360° Virtual Reality Exercise

Table 1. Descriptive Statistics of The Analysed Variables across The Three Groups

Variable Method/Group	N	Mean	Std. Deviation	Minimum	Maximum
RSA Disabled SOIna Athlete	40	83.45	10.896	58	98
RSA Disabled	40	54.25	13.733	31	82
RSA Healthy Adult	40	75.50	11.318	54	93
MO Disabled SOIna Athlete	40	75.45	10.896	50	90
MO Disabled	40	50.85	13.345	27	78
MO Healthy Adult	40	49.40	13.383	25	77
SWLS Disabled SOIna AThlete	40	47.00	10.863	20	73
SWLS Disabled	40	13.55	8.488	3	40
SWLS Healthy Adult	40	11.70	3.722	4	20
LWOS Disabled SOIna Athlete	40	7.20	3.057	2	15
LWOS Disabled	40	8.10	3.087	4	16
LWOS Healthy Adult	40	19.80	6.014	6	32
LWOW Disabled SOIna Athlete	40	14.05	5.468	7	26
LWOW Disabled	40	12.75	5.665	5	27
LWOW Healthy Adult	40	16.80	6.014	3	29

Note: RSA – Resilience Scale for Adults; M–O – Courage Scale; SWLS – Satisfaction With Life Scale; LWO – The Personal Values List, W – value, S – happiness. Source: the authors

Table 2. Mann-Whitney Test Results

Test	Value
Mann-Whitney U	87.000
Wilcoxon W	907.000
Z	-6.866
Asymp. Sig. (2-tailed)	.000

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The results related to the second research question—Do SOIna athletes with disabilities differ from non-sporting youth with disabilities in terms of resilience, courage, life satisfaction, and values?—and the third research question—Do SOIna athletes with disabilities differ in these domains from healthy adults who participate in sports as a leisure activity?—are also presented in this section. Analysis of the differences between SOIna athletes with disabilities and non-sporting individuals with disabilities revealed a statistically significant difference in resilience ($t = 5.25$; $df = 40$; $p < 0.0001$), indicating higher resilience among athletes with disabilities. A further significant difference in resilience was observed in the comparison between individuals with disabilities and healthy adults ($t = -4.15$; $df = 40$; $p < 0.001$), suggesting higher resilience levels among healthy adults (Table 1). No significant differences in resilience were found between athletes with disabilities and healthy young adults. In addition, no significant differences were observed between non-sporting individuals with disabilities and healthy young adults.

The Mann–Whitney U test results indicate a U value of 87.000, with a Z score of −6.866 and an asymptotic significance value (2-tailed) of 0.000. Since the Asymp. Sig. (2-tailed) value is less than 0.05, the results indicate a statistically significant difference between the groups. Based on these findings, training using 360° Virtual Reality video can be considered feasible for improving positive psychological aspects in athletes with disabilities (SOIna).

DISCUSSION

In accordance with the initial hypothesis, positive psychology plays a significant role in the outcomes of training using virtual reality (VR). The results obtained from athletes with disabilities indicate the presence of several characteristics that influence psychological resilience. Numerous researchers have emphasized the high level of positive psychological functioning among athletes with disabilities (Seligman and Csikszentmihalyi, 2000). One contributing factor is the persistent pursuit of goals despite various limitations. Characteristics of individuals with strong mental resilience include the ability to regain balance after critical events and to develop and grow as individuals (Duckworth et al., 2005).

The study group demonstrated high levels of several resilience-related characteristics, including life satisfaction, positive thinking, resilience, and social orientation. Psychologists and sports coaches often describe resilient Paralympic athletes as exhibiting similar personality traits (Seligman, 2019). Participation in competitive sports requires discipline and self-control, as well as a regular life rhythm, which is reflected in the results showing higher levels of structure and perseverance among athletes with disabilities. Participation in competitive sports requires discipline and self-control, as well as a regular life rhythm, which is reflected in the results showing higher levels of structure and perseverance among athletes with disabilities.

Sport, as a determining factor in the lives of the participants in this study, may influence areas such as planning, overcoming obstacles, courage, and resilience. One factor that may explain the significant similarities among the three study groups in terms of life satisfaction is that participants were in early adulthood, a developmental stage typically associated with optimism and hope for the future. The finding that individuals with disabilities report satisfaction with their lives suggests effective adaptation to the process of living with disability. In addition, physical activity was identified as a factor that enhances feelings of happiness in both study groups. Furthermore, organized sports activities provide structure

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and scheduling, such as competition dates and training camps, which may further support psychological well-being among athletes with disabilities.

A comparable level of life satisfaction among individuals with disabilities who are non-athletes can be explained in light of previous findings (Yarayan et al., 2023; Jannah et al., 2024). These studies share the assumption that humans possess an innate tendency toward growth, development, and self-realization. Perceiving one's own influence on the environment fosters a sense of self-efficacy, which may also contribute to life satisfaction. Within self-determination theory, Ryan and Deci emphasize selected aspects of motivation (Choi, Haslett, and Smith, 2021). They identify three basic psychological needs that function as regulators and motivators, which are particularly relevant for individuals with disabilities: the need to feel competent, the need to be connected with others, and the need to be autonomous. Fulfillment of these needs leads to life satisfaction across individuals. Quality of life is defined independently in both objective and subjective dimensions. The objective dimension refers to socioeconomic and demographic factors, whereas the subjective dimension is related to personal beliefs, values, perceptions of self and the future, and satisfaction with one's life (Saputra et al., 2022). Subjective quality of life is influenced by success in intimate relationships or marriage, effective professional development, and a satisfying social network. Social comparison within these domains is particularly important for individuals with disabilities, as disability may serve as a factor contributing to social exclusion or marginalization.

Sporting activity plays an important role in the lives of individuals with disabilities. Sport serves as a crucial tool that enhances motivation and contributes to social development. It is essential for all members of society to engage in sports in order to develop healthy lifestyle behaviors (Kızar, Demir, and Genç, 2021). In recent years, the quality of life of individuals with disabilities has improved significantly, with one of the most important measures being the increased participation of individuals with disabilities in sports activities (Alizadeh and Cobuliev, 2021). Through positive engagement in psychological training, an environment of acceptance, diversity, and gender equality can be fostered. Athletes have reported improvements in their use of and access to imagery techniques. Such training encourages an active participatory role, promoting imagery practice and a greater willingness to take initiative in psychological training. As many athletes had not previously engaged in structured mental training, brief explanations and the presentation of successful examples were important in building trust and facilitating engagement (Anuar and Bahar, 2023).

CONCLUSION

Psychological support is essential for athletes with mild intellectual disabilities, particularly in enhancing motivation during training and competition. Coaching these athletes requires not only an understanding of individual characteristics but also persistence and creativity in training approaches. Gradual psychological training supported by 360° Virtual Reality (VR) videos enables athletes to imitate and follow movement instructions presented in immersive environments. The 360-degree rotation feature allows athletes using VR box devices to interact digitally with realistic simulations, such as running in place, avoiding obstacles, and performing guided movements, thereby enhancing both physical engagement and psychological involvement.

This study demonstrates that training using 360° VR videos is an effective method for improving aspects of positive psychology, particularly resilience, among athletes with mild intellectual disabilities. Significant differences were found between SOIna athletes with

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disabilities and non-sporting individuals with disabilities, with athletes exhibiting higher resilience ($t = 5.25$; $df = 40$; $p < 0.0001$). A significant difference was also observed between individuals with disabilities and healthy adults, indicating higher resilience among healthy adults ($t = -4.15$; $df = 40$; $p < 0.001$). No significant differences were found between athletes with disabilities and healthy young adults, nor between non-sporting individuals with disabilities and healthy young adults. The Mann–Whitney test further confirmed significant group differences (Asymp. Sig. [2-tailed] = 0.000 < 0.05), indicating that 360° VR-based training is feasible for enhancing positive psychological outcomes in athletes with disabilities.

Overall, these findings highlight the important role of structured sports participation and innovative technological interventions in fostering psychological well-being, personal development, and social inclusion among individuals with intellectual disabilities. Despite limitations related to sample size and scope, this study provides valuable insights and serves as a foundation for further research on VR-based training for athletic and psychological development.

LIMITATIONS

This study involved a relatively small number of participants, consisting of athletes with mild intellectual disabilities from SOIna and a control group of individuals with disabilities who did not participate in sports. The limited sample size and specific participant characteristics restrict the generalizability of the findings to broader populations, including athletes with other types or levels of disabilities and individuals without disabilities. In addition, the study focused on selected aspects of positive psychology, namely life satisfaction, resilience, personal values, and courage. As a result, other relevant dimensions of psychological well-being may not have been fully captured.

Methodologically, data collection relied on self-reported questionnaires, which may introduce response biases such as social desirability or limitations in comprehension, particularly given the intellectual characteristics of the participants. Furthermore, the study examined the short-term effects of training using 360° Virtual Reality videos and did not evaluate long-term outcomes related to resilience and well-being. Consequently, the sustainability of the observed benefits remains unclear. Although comparisons were conducted among athletes with disabilities, non-sporting individuals with disabilities, and healthy adults, the absence of additional comparison groups—such as athletes with more severe disabilities or gender-specific groups—limits a more nuanced understanding of demographic variations.

IMPLICATIONS

The findings of this study highlight the potential of 360° Virtual Reality (VR) video as a feasible and effective tool for enhancing resilience and positive psychological attributes among athletes with intellectual disabilities. Sports organizations and rehabilitation programs may consider integrating this technology into regular training routines as part of a structured psychological and physical development approach. The results also support the view that structured sports participation plays a significant role in strengthening resilience and overall psychological well-being among individuals with disabilities, underscoring the importance of expanding inclusive opportunities in both competitive and recreational sports settings.

Furthermore, VR-based training may serve valuable educational and therapeutic functions. Coaches, sport psychologists, and special education practitioners can utilize this approach not only to enhance athletic performance but also to improve life satisfaction, courage, and value orientation among athletes with special needs. At the policy level, the evidence provided by

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this study may inform policymakers and disability-related organizations, such as SOIna, to allocate greater resources toward technology-based interventions that promote psychological development and social inclusion for individuals with intellectual disabilities. Finally, this study opens avenues for future research, including the investigation of long-term effects, cross-cultural comparisons, and the effectiveness of VR-based interventions across different sports, age groups, and levels of intellectual disability.

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AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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