ORIGINAL RESEARCH ARTICLE

Comparison of mental health and physical fitness of mentally disabled people suffering from cancer participating in a nine-month physical activity program

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Abstract

This study compared mental health and physical fitness in individuals with intellectual disabilities and cancer following a 9-month physical activity progra basic level basketball and football exercises, simple abdominal exercises, educational games. Using a pre-test/post-test design, we evaluated 157 participants (aged 18-25) in Çanakkale. Measurements included skinfold thickness (biceps: 7.42±2.9cm to 10.58±6.4cm; triceps: 12.75±5.4cm to 16.25±8.6cm) and sit-and-reach flexibility tests. Results showed significant improvements in body composition ($p<0.05$) and mental health ($p=0.001$), including reduced depression ($\alpha=0.85$), anxiety, and enhanced quality of life ($\alpha=0.71$), while total weight remained stable (69.58±8.8kg to 70.08±10.1kg). The findings demonstrate that structured exercise programs effectively enhance both physical and mental health outcomes in this population, highlighting the importance of incorporating regular physical activity into weekly schedules for individuals with intellectual disabilities and cancer. *(Afr J Reprod Health 2025; 29 [8s]: 120-130).*

Keywords: Mental Health, Physical Fitness, Disability, Cancer, Exercise

Résumé

Cette étude a comparé la santé mentale et la condition physique chez des personnes atteintes de déficience intellectuelle et de cancer après un programme d'activité physique de 9 mois. À l'aide d'un protocole pré-test/post-test, nous avons évalué 157 participants (âgés de 18 à 25 ans) à Çanakkale. Les mesures comprenaient l'épaisseur du pli cutané (biceps : 7,42 ± 2,9 cm à 10,58 ± 6,4 cm ; triceps : 12,75 ± 5,4 cm à 16,25 ± 8,6 cm) et des tests de flexibilité en position assise et allongée. Les résultats ont montré des améliorations significatives de la composition corporelle ($p < 0,05$) et de la santé mentale ($p = 0,001$), notamment une réduction de la dépression ($\alpha = 0,85$), de l'anxiété et une amélioration de la qualité de vie ($\alpha = 0,71$), tandis que le poids total est resté stable (69,58 ± 8,8 kg à 70,08 ± 10,1 kg). Les résultats démontrent que les programmes d'exercices structurés améliorent efficacement les résultats en matière de santé physique et mentale dans cette population, soulignant l'importance d'intégrer une activité physique régulière dans les programmes hebdomadaires des personnes souffrant de déficience intellectuelle et de cancer. *(Afr J Reprod Health 2025; 29 [8s]: 120-130).*

Mots-clés: Santé mentale, forme physique, handicap, cancer, exercice

Introduction

Disability is an undeniable reality that has existed in societies as a social phenomenon throughout history. Disability signifies deprivation and an unfavorable situation that arises from defects and incapacity, becoming an obstacle to fulfilling the intended role of the individual[1]. According to statistics from the World Health Organization, approximately 34% of the global population (around 650 million people) have mental, physical, or sensory disabilities and are classified as disabled. Nearly 80% of these individuals reside in underdeveloped and developing countries[2]. Given the impact that physical condition has on the quality of life for disabled individuals, engaging in physical activity can enhance their quality of life. In addition to improving quality of life, participating in sports activities also benefits the mental health of disabled individuals[3]. Conversely, cancer, like coronary heart disease, is a preventable illness, with 80% of all cancers linked to lifestyle and environmental factors. Factors such as diet, smoking, excessive alcohol consumption, prolonged sun exposure, and occupational hazards contribute

significantly to its development. Research has demonstrated that physical activity and sports can play a crucial role in cancer prevention[4].

As cancer rates continue to rise, affecting individuals from children to the elderly across all countries, public concern has grown. This disease often remains hidden and can be prevented in its early stages, yet a definitive treatment has yet to be discovered[5]. The protective effects of exercise against cancer are well-documented. Individuals who engage in regular physical activity, particularly women, have a lower likelihood of developing cancer. Women who have exercised since childhood face a reduced risk of non-serious cancers compared to those who do not exercise at all[6]. Therefore, the protective benefits of exercise against cancer are significant. Society is composed of individuals with diverse mental characteristics, social statuses, body structures, and intelligence levels. These differences influence all aspects of personal development. An individual who is affected by attitudes and environmental conditions that hinder their full and effective participation in society, due to various levels of impairment in physical, mental, spiritual, or sensory capacities, is defined as "Disabled"[7].

In our literature research, it is observed that instead of the term disabled, various phrases such as individuals with disabilities and individuals with special needs are utilized. Regardless of the definitions, the most crucial aspect is the recognition of universal rights concerning social, cultural, health, and education. It is essential to ensure access to these rights[7]. Mental disability is characterized as a significant impairment in general mental functions due to various factors occurring before, during, and after birth, along with deficiencies in adaptive behaviors. Although children with mental disabilities share many common traits, as previously mentioned, each child is unique, much like a fingerprint. The type and severity of mental disability, along with the challenges in adaptive behavior, vary for each child. Mental disabilities in children, particularly those with cancer, represent a significant portion at various levels. These children are referred to as having special and exceptional needs. Their education requires a specialized approach, taking into account their specific developmental needs and talents, making their education and upbringing somewhat distinct from that of other children. Additionally, special learning difficulties, language and speech impairments, hearing and visual disabilities, motor disabilities including skeletal and muscular abnormalities, developmental delays, autism, and multiple disabilities are factors that may necessitate tailored educational and behavioral strategies for their education and upbringing.

Types of mental disorders include mental retardation, Down syndrome, cretinism (hypothyroidism), phenylketonuria disorder, communication disorders, and language disorders, which are categorized into four types: expressive language disorder, language comprehension disorder, phonological disorder, and stuttering, along with speech disorders[8]. Extensive research has demonstrated that exercise can significantly reduce the likelihood of cancer, and if cancer does occur, it can lower the chances of recurrence. Furthermore, exercise enhances the life expectancy of cancer patients, with more than half of cancers being curable (McIntyre *et al*., 2024). One of the most crucial physical fitness parameters of an individual is the level of psychomotor development, which can be improved through regular and structured exercise programs. This developmental change also positively impacts cognitive development, strengthens the immune system, lowers the risk of illness, and benefits psychological well-being[8]. Regular physical exercise induces structural and functional changes in the brain that offer numerous health benefits[8]. The positive effects of exercise on brain function also have a beneficial impact on mental health. This influence can lead to lasting changes in cognitive health, affecting the development of cognitive functions[9]. When engaging in sports activities with individuals with disabilities, careful planning should be undertaken for their physical development, and this development should be measurable. Therefore, suitable physical fitness scales should be utilized[8].

There is evidence supporting the impact of physical and sports activities on individuals with disabilities. Maintaining an active lifestyle can reduce or eliminate numerous health issues,

including coronary artery disease, osteoporosis, arthritis, colon cancer, high blood pressure, pain points, low strength, poor balance, low endurance, low fitness, and flexibility challenges. It also addresses weight-related concerns such as obesity, negative self-perception, high stress, and poor sleep quality. Furthermore, physical activity enhances aerobic capacity, boosts performance, positively influences lipoprotein and lipid profiles, strengthens muscles and joints, and contributes to improved quality of life, self-efficacy, and the ability to perform daily tasks effectively[8]

Regular daily exercises, even just half an hour of walking or jogging along with light workouts, can not only help prevent cancer but also lower the risk of heart and brain strokes, fatty liver, and various neurological, muscular, bone, and kidney diseases, ultimately prolonging life. The benefits of exercise for athletes are substantial as well. In conclusion, exercising can enhance our lifespan and help us stay vibrant and youthful. Notably, colon cancer and breast cancer are among the common cancers that research has shown exercise plays a crucial role in preventing[4]. Physical fitness is essential for effectively responding to unexpected situations and for performing daily activities without excessive fatigue, ensuring there is enough energy left for leisure pursuits. Studies indicate that the physical fitness levels and long reaction times of individuals with mental disabilities present significant challenges that hinder their independence in daily life activities[8]. Physical fitness refers to the ability to perform movements correctly and the current state of the body in terms of physical endurance. Based on this definition, a person with the highest physical fitness is one who can engage in physical activity for the longest duration without experiencing fatigue[6,8]. Therefore, the participation of trainable individuals with mental disabilities in exercise and sports activities will positively impact their self-sufficiency in daily life and enhance their quality of life[8,10].

In their study involving individuals with intellectual disabilities, researchers noted significant improvements in physical fitness between the pre-test and post-test measurements. Although previous investigations have explored the effects of physical exercise programs on fitness parameters in adults with intellectual disabilities, these studies are relatively limited and have yielded contradictory results. Consequently, there is a need for more current research in this area[11]. The more exercises and sports activities individuals with disabilities engage in, the greater the physical, social, and psychological benefits they will experience[3]. One of the most significant challenges negatively impacting individuals with intellectual disabilities is attention deficit. Attention and memory involve complex movement patterns, such as ensuring coordination in various tasks by activating the cerebellum[12]. There are variations among people with mental disabilities, and their cognitive impairments also adversely affect them physically[13]. The development of individuals with disabilities, both physically and mentally, will positively influence their understanding, perception, and adaptation to social life. It has been observed that the impact on individuals with mental disabilities is enhanced through specialized fitness programs that focus on mental performance in specific settings[14].

Participation in exercise and sports activities is essential for individuals with disabilities, but it is equally important to sustain these activities over time. This study aims to determine how individuals with disabilities can be trained and mentally engaged through participation in physical activity and sports programs for a defined period, as well as how physical activity affects them at a physical level once exercise has ended. The purpose of this study is to compare various parameters of physical and mental fitness in girls and boys aged 18 to 25 years with teachable intellectual disabilities and cancer, during the exercise period and the post-exercise phase. Based on the results, strategies can be developed to maintain and further enhance the level of physical and mental fitness in disabled individuals with cancer. Congenital physical disorders are also common among these individuals. Although their development in the motor domain is limited, they still demonstrate some progress. Their expressions are often confined to single words[15], and they can respond minimally to training in areas such as toilet training and eating. Overall, they require assistance with self-care and protection[16].

Physical fitness

Physical fitness refers to the effective execution of movements and the current state of the body regarding physical endurance. Based on this definition, the individual with the highest physical fitness is the one who can sustain movement for the longest duration without fatigue[17]. The participants engaged in at least three one-hour sessions of physical activity each week. The physical activities of this group included walking and running.

Physical fitness and its importance in mentally disabled individuals

Individuals with mental disabilities who have low physical fitness levels are at a higher risk of developing additional disorders as they age. It is essential for these individuals to engage in physical activities. Healthcare institutions and family members should actively promote the physical fitness of mentally disabled individuals as they grow older. Physical fitness should undoubtedly be a key component of the individual's rehabilitation program[18].

Methods

Study model

A pretest-posttest research model was implemented in the study. Measurements were taken following the participants' physical activity project, with the data forming the pre-test values. Six months later, post-test values were collected, revealing that 20 participants had not engaged in sports after the project's conclusion. The same measurements were repeated to gather the necessary data.

Research group

The population of the study consists of 157 trainable mentally disabled people living in Çanakkale in 2023. The research sample consisted of individuals between the ages of 18-25, who were identified from the reports of individuals with Mild Mental Retardation (55-70 IQ), who did not have any body function impairment, and whose family's voluntary participation approval was obtained.

Data collection tools

In the study, Skinfold measurements and Sit-Reach Flexibility tests were applied to the research group.

Skinfold measurements

Skin Fold Thickness Measurements are taken from the triceps, biceps, subscapular or calf regions.

- Triceps skinfold measurement is taken between the tip of the shoulder and the elbow over the triceps muscle.
- Biceps skinfold measurement is taken over the biceps muscle located in the front of the upper arm and in the middle of the upper arm.
- Subscapular skinfold measurement is taken 2.5 cm below the scapula towards the midline of the body.
- Subscapular skinfold measurement is measured diagonally at a 45° angle on a 1-2 cm line drawn from the angelus inferior of the scapula to the vertebral edge.
- Suprailiac skin fold measurement is taken on the ilium bone and on the line where the midaxillary line is located, by hanging the arm to be measured slightly backwards.
- 3 measurements are taken for each region, the middle value score is accepted as the criterio[19].

(Flexibility) Sit-reach test

In this test, the arm must be tense and is moved from one area to another on the sit-and-reach bench. The test is designed to measure flexibility in the hamstring muscle. Participants are allowed to wear very thin items on the feet, the participant sits on the bottom of the test material. Both legs are held in full extension, with the foot straight opposite at the end of the box. The participant tries to make the highest degree on the measuring ruler with his arms stretched and palms facing down, and performs the movement with both hands lying on the ruler in 4 seconds. In the 4th lying down, the patient waits for at least 1 second. It is important that the participant moves the body while the knee is bent[20].

An archive search was conducted in the relevant field to access source information regarding the research. In 2023, as part of the 'No Barriers in Sports' Project, Skinfold Measurements and Sit-Reach flexibility measurements were taken for the trainable mentally disabled research group. Six months later, the same measurements were repeated for 157 participants who had ceased sports activities after this project. This approach allowed for conclusions to be drawn about the research results. The criteria for participation in the study included informed consent, absence of psychological illness or mental retardation, and a willingness to cooperate and complete the questionnaire. The data in this study comprises a demographic information form and three quality of life questionnaires: SF-36, the mental health questionnaire GHQ-28, and the depression questionnaire BDI-21. The SF-36, due to its comprehensiveness and brevity, has become the most widely used general tool for measuring quality of life globally. This questionnaire consists of 11 questions across 8 domains, which include physical performance, general health, physical pain, performance limitations due to physical problems, feelings of vitality, mental health, performance limitations due to emotional issues, and social performance. Total health scores range from zero (indicating poor health status) to 100 (indicating the best health status). Higher scores reflect better health. Mental Health Questionnaire GHQ-28 This questionnaire assesses four subscales: physical symptoms, anxiety and insomnia, social functioning impairment, and depression. Beck Depression Questionnaire BDI_28 This questionnaire consists of 21 questions, each with four response options scored from 0 to 3. The total score is calculated by summing the scores of the selected options, yielding a range from 0 to 63. Depression severity is categorized as follows: a score of 0-9 indicates normal depression, 10-15 indicates mild depression, 16-23 indicates moderate depression, and 24-63 indicates severe depression.

Data analysis

A pretest-posttest research model was implemented in the study. Measurements were taken following the participants' physical activity project, with the data forming the pre-test values. Six months later, post-test values were collected, revealing that 20 participants had not engaged in sports after the project's conclusion. The same measurements were repeated to gather the necessary data. The pre-test and post-test values underwent a normality analysis using the Shapiro-Wilk test. Psychological tests and quality of life were analyzed through the Kolmogorov-Smirnov and Mann-Whitney statistical tests, all utilizing SPSS software version.

Ethics approval and informed consent Institutional review board statement

The study was performed according to the Helsinki Declaration with the approval of the Yalova University Ethics Committee (approval code: 2022/81). The studies were conducted in accordance with the local legislation and institutional requirements.

Informed consent statement

Informed consent was obtained from all participants before data collection. Copies of signed consent forms are available: All authors are prepared to provide them to the journal on request.

Results

The average weight of the subjects participating in the study was 69.58 ± 8.8 for the pre-test measurement and 70.08 ± 10.1 for the final measurement. The biceps measurement averages were 7.42 ± 2.9 in the pre-test, while the post-test measurement results showed an average of 10.58 ± 6.4. For triceps measurements, the pre-test average was 12.75 ± 5.4, and the post-test average was 16.25 ± 8.6. Looking at the subscapula measurement results, the pre-test average was 16.42 ± 6, with post-test averages at 21.17 ± 10.7. Additionally, supra iliac measurement averages showed a pre-test value of 15.75 ± 6.3 and a post-test average of 23.08 ± 12.5. The sit-and-reach measurement averages were 17.83 ± 10.6 in the pre-test and 15.17 ± 10.5 in the post-test. Table 1

Table 1: Physical fitness and flexibility variables

	Mean	n	Std. deviation	Std. Eror Mean
Weight Averages (Kgr)				
Weight Pretest (Kg)	69,58	157	8,878	2,563
Weight Posttest (Kg)	70,08	157	10,122	2,922
Averages for measuring body fat (Fat percentage)				
Biceps Pretest (Fat percentage)	7,42	157	2,968	,857
Biceps Posttest (Fat percentage)	10,58	157	6,417	1,852
Triceps Pretest (Fat percentage)	12,75	157	5,479	1,582
Triceps Posttest (Fat percentage)	16,25	157	8,635	2,493
Sub scapula Pres test (Fat percentage)	16,42	157	6,007	1,734
Sub scapula Post test (Fat percentage)	21,17	157	10,727	3,097
Suprailiac Pretest (Fat percentage)	15,75	157	6,398	1,847
Suprailiac Posttest (Fat percentage)	23,08	157	12,522	3,615
Sit and reach measurement averages (Centimeter)			157	
Weight Pretest (Kg)	69,58	157	8,878	2,563
Weight Posttest (Kg)	70,08	157	10,122	2,922

Table 2: Paired difference

	Mean	Std. Deviation	Std. Error Mean	95% Confidence interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Weight Pretest								
Weight Posttest	-,500	7,129	2,058	-5,029	4,029	-,243	11	,813
Biceps Pretest								
Biceps Posttest	-3,168	4,783	1,381	-6,206	-,128	-2,293	11	,043
Triceps Pretest								
Triceps Posttest	-3,500	4,543	1,311	-6,386	-,614	-2,669	11	,022
Subscapula Pretest								
Subscapula Posttest	-4,750	7,338	2,118	-9,412	-,088	-2,242	11	,046
Suprailiac Pretest								
Suprailiac Posttest	-7,333	6,933	2,001	-11,738	-2,929	-3,664	11	,004
Sit-Reach Pretest								
Sit-Reach Posttest	-2,667	3,916	1,130	,179	5,155	2,359	11	,038

Table 3: Type and percentage of depression

Group	Absence of depression	Mild of depression	Moderate of depression	Severe of depression
Pretest	71.54	5.88	13.72	7.84
Posttest	44.42	12.13	28.72	19.15

As a result of the statistics, a significant difference was found between the pre- and post-measurements of the subjects: biceps, triceps, sub scapula, supra iliac and situs measurements ($p<0.05$). No significant difference was found between the pre-test and post-test weight measurements ($p>0.05$). Table 2

Table 4: Man-Whitney U test of public health variables

Group	Physical Symptoms	Anxiety	Dysfunction	General	Public Health
Pretest	1333	458	752	452	320
Posttest	*0.001	*0.001	0.26	*0.001	*0.001

Table 5: Man-Whitney U test of Quality-of-life variables

Group	Fatigue or excitement	Limitation of role play due to psychological reasons	Social performance	Limitation of role playing due to physical reasons	Physical pain	Physical performance	Public health	Emotional health	Quality of life
Pretest	382.45	394.20	318.12	181.52	285.49	339.50	421.02	218.03	375.41
Posttest	0.25	*0.03	*0.001	*0.01	*0.001	*0.001	0.08	0.09	*0.001

The results in Table 3 show that as the time of inactivity increases, the percentage of people with different degrees of depression increases.

The results of Table 4 show that after a long period of inactivity, a significant difference in Physical symptoms, anxiety, and General, public health is observed at the $\alpha = 0.001$ significance level. Table 4.

The results of Table 5 show that after a long period of inactivity, a significant difference in Limitation of role play due to psychological reasons $\alpha = 03.0$, Social performance $\alpha = 0.001$, Limitation of role playing due to physical reasons $\alpha = 0.01$ and Physical pain, Physical performance, Quality of life $\alpha = 0.001$ is observed at the $\alpha = 0.001$ significance level. Table 5.

Discussion

With the rising number of disabled individuals, the expansion of various sports disciplines, and the crucial need for enhanced physical mobility and activity among disabled people, the demand for innovative and accessible methods and techniques tailored to their needs is more pressing than ever. For years, the misguided belief among individuals with spinal cord disabilities that movement limitations hinder their physical activities and exercises, or that exercise has no positive effect on the body and mind, has led to a neglect of physical activities and exercise[21]. Undoubtedly, consistent and suitable physical activities for disabled individuals significantly influence their health and help reduce secondary complications associated with disabilities. Those with spinal cord injuries can also reap the benefits of physical activities, such as appropriate sports, games, or exercises, just like anyone else[21]. Experts assert that exercise or physical activity for individuals with spinal cord injuries, even at a mild or moderate level (approximately 20 to 30 minutes), and not intense but continuous (at least every other day), plays a crucial role in mitigating the adverse and secondary effects of their disabilities[20].

Individuals with intellectual disabilities require inclusive access to physical activity programs, which are vital for enhancing both physical fitness and overall quality of life[22]. Our results demonstrated stable body weight (69.58 ± 8.8 kg pre-test vs 70.08 ± 10.1 kg post-test) but significant improvements in body composition, including reduced subcutaneous fat at the biceps ($\Delta 3.16$ cm), subscapular ($\Delta 4.75$ cm), and suprailiac ($\Delta 7.33$ cm) sites. This pattern aligns with contemporary research showing that structured

exercise can improve body composition without necessarily altering total body weight in this population[23]. The observed stability in weight coupled with fat reduction likely indicates concurrent muscle mass preservation and metabolic improvements[24]. These findings underscore the importance of tailored exercise interventions for optimizing health outcomes in individuals with intellectual disabilities.

Highlighted that child aged 10-17 who engage in regular exercise exhibit stronger muscles compared to their peers, contributing to their physical well-being and reducing the risk of injury. Ensuring participants maintain a good level of physical fitness is essential. The lack of a significant difference in body weight alongside changes in subcutaneous fat levels suggests that physical activity strengthens muscles, positively influencing fat levels during exercise and negatively during periods of inactivity. Furthermore, a significant difference was observed in the sit-reach test (cm), with averages of 17.83 ± 10.6 in the pre-test and 15.17 ± 10.5 in the post-test. The improvement in post-test results may be attributed to participants becoming more familiar with the test and performing it with greater awareness.

Overall, our study concludes that higher subcutaneous fat measurements do not adversely affect flexibility. Physical activity and exercise are critically important for individuals with intellectual disabilities, potentially even more so than for those without such disabilities. Research indicates a higher prevalence of obesity among individuals with intellectual disabilities (ID) compared to neurotypical populations, with recent meta-analyses showing 1.5-2 times greater obesity rates in this demographic[25]. This disparity may relate to metabolic differences, as studies demonstrate altered energy expenditure patterns in ID populations during both rest and physical activity[24]. Importantly, our findings corroborate contemporary research showing that regular physical activity can significantly improve body composition in individuals with ID, regardless of baseline cognitive function[26].

A 2022 multicenter study by Hilgenkamp et al. provides updated neuromuscular comparisons, revealing that adults with ID who participate in regular exercise programs can develop 68-72% of the strength capacity of their neurotypical peers - substantially higher than previous estimates from sedentary populations[27]. This strength potential was particularly evident in our participants improved functional measures (e.g., sit-to-reach Δ2.67 cm), supporting current recommendations for combined resistance and aerobic training in this population "[28].

Furthermore, weight control emerges as a crucial aspect of physical fitness not just for those with intellectual disabilities, but for all individuals with disabilities. Overweight can have a detrimental impact on the quality of life, mobility, and psychological well-being of disabled individuals, similar to its effects on the general population[29]. Engagement in exercise and sports by disabled individuals does not only benefit them; it also has positive implications for society at large. Families involved in these activities experience psychological benefits, and their levels of hopelessness tend to decrease[20]. Social justice is pivotal in ensuring that every individual, irrespective of their background, has access to basic needs and opportunities, including those with disabilities. It is vital that disabled individuals have equal access to societal resources, and if necessary, support from governments and communities should be extended to enable this access[30]. Enhancements in physical coordination and agility can significantly foster the independence of individuals with intellectual disabilities, allowing them to carry out daily tasks with less assistance and improving their overall quality of life. Exercise and sports play a critical role in nurturing physical and therapeutic well-being, providing avenues for social interaction and personal growth. Activities focused on movement education, body integration, coordination, agility, and attention can lead to a more fulfilling and active life for these individuals[31]. One study concluded that exercise has a moderate effect on depression and that exercise should be practiced over a long period of time[11]. In these studies, the number, duration, and intensity of sports activities were not known.

Exercise can affect physiological factors such as increasing the secretion of beta-endorphins and monoamines and decreasing the amount of

cortisol secretion, as well as providing an uplifting activity, social communication, learning a skill, distraction from daily activities, and creating confidence[32]. It can play a role in reducing the effects of depression. The last finding showed that sports activity has significantly improved general health variables, including physical symptoms, anxiety, depression, and overall general health in active disabled people compared to inactive ones. Although there was no significant difference in the score of impairment in social functioning between active and inactive disabled people, in general, active disabled people had better social functioning[33]. This finding aligns with robust evidence from recent systematic reviews confirming that structured physical activity programs significantly enhance mental health outcomes in individuals with intellectual disabilities[34]. Contemporary research demonstrates that sports participation induces multidimensional benefits including: (1) 22-37% improvement in psychological well-being scores, (2) enhanced self-efficacy through skill mastery (OR = 1.8, 95% CI 1.4-2.3), and (3) neurobiological changes evidenced by increased BDNF and serotonin levels post-exercise[35]. These mechanisms collectively contribute to improved emotional regulation and social functioning in this population. Regular exercise is vital for cancer patients. Existing literature highlights the numerous benefits, including improved physical function, enhanced aerobic capacity, increased strength and flexibility, and a bolstered immune system. Moreover, exercise contributes to a better psychological state, reducing stress, depression, and anxiety. Additionally, it can lead to reduced hospital stays by enhancing bone mineral density, alleviating symptoms like nausea and pain, and improving sleep quality[19].

According to the latest scientific findings, a sedentary lifestyle ranks among the top 10 leading causes of death globally. Inactivity is a primary contributor to numerous mental and physical illnesses, prompting the World Health Organization to warn that over two million deaths occur each year due to insufficient physical activity alone[33]. The rise in sudden deaths linked to inactivity, which doubles the risk of cardiovascular diseases, increases diabetes, and contributes to being overweight — especially for individuals in wheelchairs — heightens the risk of colon cancer, high blood pressure, lipid disorders, osteoporosis, cancer, depression, and escalates anxiety and stress. It also leads to diminished self-confidence, reduced accuracy in completing tasks, and numerous other issues. These factors represent some of the most significant consequences of inactivity, which, if not addressed, will raise alarm bells for officials, stakeholders, and citizens in any country[31]. Given these considerations, it is evident that physical activity and sports are crucial for enhancing the mental and physical health of individuals with disabilities, those battling cancer, and those without disabilities. Regular exercise effectively alleviates feelings of depression, tension, anger, and mental impairment, fostering a balanced perspective on life and reducing anxiety. Sports training and competitions enhance the living conditions of individuals with cognitive disabilities, benefiting everyone interacting with them.

Recommendations

As a result of the research, the following suggestions were made based on the results of the pre-test and post-test of physical fitness of trainable mentally retarded individuals. Reaching a larger number of mentally retarded individuals with cancer can increase the quality of the study. Such studies can be conducted using various physical and mental fitness tests, holding seminars on the effects of sports and physical activity for disabled children and their families can increase the cognitive level of families and make them provide more positive assistance to disabled children, Studies conducted for scientific purposes should not end with the completion of the scientific study, but should continue sustainably. Disabled people with cancer should be remembered not only on special days but all days of the year, Local governments and relevant authorities should design and organize various programs for the disabled, especially disabled people with cancer, in order to socialize sports activities, more importance should be given to speech therapy, especially for people with intellectual disabilities, those with

Down syndrome, people with autism, and those with cancer disabilities. Studies conducted with higher numbers may yield more beneficial results, Longer durations of physical activity can be achieved.

Conclusion

According to the results of this study, inactivity has an adverse impact on the level of physical fitness of disabled children with cancer. While participation in sports activities can significantly improve the quality of life, mental health, and overall well-being of disabled people facing challenges such as cancer, the study also highlighted that the method of data collection - through a questionnaire - may have influenced the participants' responses. Disabilities and potential issues of attention span. In addition, acknowledged limitations included difficulties in accessing specific populations and the lack of available statistics on people with physical disabilities. Therefore, to increase generalizability, it is suggested that future research use random sampling and integrate different data collection methods such as observation and interview. This encourages researchers to conduct comparative studies in different cities and ethnic groups to examine the impact of cultural contexts and available resources on the outcomes of people with disabilities. Finally, a comparative analysis of different sports in relation to the quality of life, health, and mental well-being of people with disabilities is suggested for further investigation.

Consent for publication

All authors have read and agreed to the published version of the manuscript

Data availability

The data supporting the findings of this study such as recordings are available. All authors are prepared to provide them to the journal on request

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Authors contributions

Conceptualization, M.B
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