

The effect of the sporting physical activity on the psychological aspect of people with motor disability [10-18 years]

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ABSTRACT

This research provides an investigation of the influence that physical activity has on psychological well-being for 10-18-year-olds with motor disabilities. Employing a descriptive-analytical method, the research was conducted on one of those types: athletes. Results suggest that this form of intervention is effective in increasing self-esteem, reducing anxiety, and improving emotional well-being by helping to promote physical activity. Moreover, it promotes socializing and a feeling of achievement in turn encouraging the mental state. This study describes a novel, sports-centered rehabilitation program in adolescents with mobility-disability that afforded significant changes since sport participation increased strength and stamina. At the same time, by encouraging physical activity, these programs also facilitate psychological development and well-being in those who participate. The research has shown that there is a need for sport initiatives catered to the needs of this population, increasing their quality of life, also encouraging greater social inclusion.

Keywords

Physical activity, motor disabilities, psychological well-being, rehabilitation, mental health.

Introduction

1.1. Background of the study

Physical activity is required to improve physical and mental health. More sneakily, current research shines as a spotlight on the role that psychological factors play in whether or not people stick with their physical activity guidelines. People with higher levels of anxiety or depression are less likely to meet these thresholds, while richer psychological well-being—defined by high life satisfaction, optimism, and positive emotions—is linked to better physical health outcomes. Among older adults, a positive cross-relationship existed between baseline psychological well-being and subsequent changes in physical activity such that higher levels of positive affect were associated with larger increases in PA (Table 1). This relationship remains the same when accounting for health status and depression, indicating that psychological well-being separately relates to physical activity levels among older adults. People with better psychological well-being keep activity level constant or reduce it to a lesser degree than people of lower well-being.

In young adults, the connection between physical activity and psychological well-being is mediated

by intrinsic motivation. There is evidence that higher physical activity levels relate to better psychological outcomes, and so fostering intrinsic motivation may support engagement with the beneficial effects of physical activity in this age group.

In sum, many studies demonstrate a direct association of physical activity with psychological well-being, at almost all ages. This understanding can help drive interventions to encourage better behaviors, ultimately leading to a healthier populace—even among those who may have mobility or health issues. (Granero-Jiménez et al., 2022) (Kim et al., 2017).

1.2. Purpose of the research

In this study, we explore the association among physical activity, motivation, and psychological well-being in young adults. It focuses on the place of Self-Determination Theory (SDT) in determining why different levels of autonomy do or don't inspire motivation. This study has the ultimate goal of understanding what motivates young adults to participate in physical activity and how exercise is associated with mental health, thus contributing evidence-based knowledge that can be used ultimately for improving overall well-being among this population.

It also aims to extend findings showing an interrelation between physical health and mental health. In particular, to our knowledge, no existing trial will evaluate the impact of higher levels of physical activity on various dimensions of psychological well-being such as mood and sense of coherence (however, a few studies have examined resilience), nor their influence over stress management and coping abilities. The research aims to help inform public health and mental wellness strategies by studying the lasting impact of a regular exercise regimen on these areas.

Secondly, the research looks at adults with a higher education level and studies whether or not there are gender differences in physical activity levels concerning mental health outcomes. Targeted advice has a goal to offer insights that apply specifically to those investors. In general, this study seeks to demonstrate that the differential conceptualization of motivational variables (i.e., intrinsic vs. extrinsic) offers an interesting alternative regarding physical activity behavior among young adults in enhancing psychological well-being. Through the evaluation of these factors and how they relate to mental health, the research hopes to provide useful suggestions for healthier living practices as well as psychological interventions guided by physical exercise that can promote a better quality of life in this segment. Granero-Jiménez et al., 2022 Molcho et al., 2021.

1.3. Scope of the study

The aim of this study was to assess the level of practice and psychological well-being interaction among 10–18 years old physically disabled persons. Studies have shown that getting active can improve physical health combined with

mental well-being, alleviating factors such as depression and stress. This demographic will benefit from regularly exercising to boost self-esteem, lessen anxiety, and enhance mental well-being.

Physical activity has long been lauded for its ability to help prevent a multitude of health conditions and improve general well-being, including mental well-being. Playing sports helps to foster social connections, develop self-confidence, and improve body image, meaning that overall health is improved greatly. Higher amounts of exercise are associated with fewer symptoms of anxiety and depression in teenagers, suggesting that combating these health problems requires more active lifestyles. Since the late 19th century, information has been changing about the relationship between physical activity and mental health, leading to departments of sports psychology in labs as well as establishing organizations regarding such a topic. The purpose of this study is to fill a gap in knowledge by investigating the secondary effects of participating in sports integrated into rehabilitation programs for children and adolescents aged 10–18 with motor disabilities. The study will address the impact of physical activity on this particular circumstance (self-esteem, anxiety, and quality of emotional well-being.) The study aims to do this in order to gain an understanding of potential medicine after the game or clinical worthiness with young people who have disabilities. (Davison et al., 2007), (Martín-Rodríguez et al., 2024), (III & HD, 2013), (Kim et al., 2023), (Molcho et al., 2021) and (Trajković et al., 2023).

Construct	Scale range	Age 11	Age 13
Pubertal development			
Tanner Breast Stage	1 – 5	2.24 (.74)	3.74 (.89)
Estradiol (pg/mL)	0 – 21.76sub-ref-†	6.42 (5.72)	-
Pubertal Development Scale	1 – 4	2.05 (.47)	-
Psychological well-being			
Depression	0 – 17sub-ref-†	3.54 (3.43)	3.31 (2.92)
Global Self Worth	1 – 4	3.51 (.45)	3.55 (.45)
Perceived Athletic	1 – 4	2.95 (.63)	2.84 (.63)

Competence			
Body Esteem – weight related	1 – 4	3.22 (.75)	2.72 (.92)
Maturity Fears	1 – 4	1.88 (.80)	2.07 (.82)
Physical Activity			
Self-reported physical activity	1 – 4	2.95 (.35)	2.78 (.41)
Enjoyment of physical activity	1 – 4	-	4.24 (.60)
Objectively measured MVPA (min/day)	4.64 – 83.64sub-ref-†	-	35.40 (14.10)

Table 1: Mean (sd) scores for each measure of pubertal development, psychological well-being and physical activity (Davison et al., 2007)

1.4. Research methodology

Research methodology: A three-step regression analysis would examine the relationship between physical activity, psychological well-being, and motivation among motor disabled individuals aged 10-18. The primary objectives are to determine the most important factors related to these variables, which will be tested several times for multicollinearity to ensure that the results are valid. The treatment would allow one to better understand how physical activity influences self-esteem, emotional well-being, and general anxiety and can contribute to improving the overall quality of life. The participants would meet established rating scales for motor disabilities. Data will be collected using survey and assessment measures to determine the degree of

physical activity, psychological health, and motivation. Valid statistical math will be used to analyze the obtained data and draw appropriate conclusions. Among the research goals is the desire to promote the use of physical activity in rehabilitation units for minors with motor disabilities, which will likely improve both the physical and psychological condition. The approach is supported by relevant research demonstrating the benefits of this type of treatment for patients with MDD. The educational focus is valuable for promoting the benefits of physical activity from a psychological perspective and could improve the quality of care services in the future. (Granero-Jiménez et al., 2022); (Jacinto et al., 2023); (Martín-Rodríguez et al., 2024); (Kim et al., 2017).

	B	Standard Error	β	Sig.	95% CI for B	R ²
Lower Limit	Upper Limit					
Model: IPAQ Level	0.16					
Intrinsic Motivation	0.25	0.03	0.33	0.00	0.19	0.32
BMI	0.02	0.01	0.12	0.005	0.01	0.03
Personal Growth	0.11	0.04	0.11	0.009	0.03	0.20
Gender	0.15	0.07	0.09	0.033	0.01	0.29
Model: IPAQ Level (Female)	0.16					
MPAM-R	0.32	0.37	0.32	0.00	0.22	0.42
Personal Growth	0.20	0.05	0.18	0.00	0.09	0.31
BMI	0.02	0.06	0.13	0.01	0.01	0.04
Model: IPAQ Level (Male)	0.14					
Intrinsic Motivation	0.29	0.06	0.37	0.00	0.18	0.41
Model: Ryff	0.14					

Intrinsic Motivation	0.28	0.04	0.42	0.00	0.22	0.35
Social (MPAM-R)	-0.22	0.04	-0.31	0.00	-0.29	-0.15
Age	0.02	0.01	0.10	0.02	0.003	0.04
Gender	-0.14	0.06	-0.10	0.02	-0.27	-0.02
Model: Ryff (Female)	0.08					
Intrinsic Motivation	0.22	0.04	0.34	0.00	0.13	0.30
Social (MPAM-R)	-0.19	0.05	-0.28	0.00	-0.28	-0.10
Model: Ryff (Male)	0.26					
Intrinsic Motivation	0.22	0.04	0.34	0.00	0.13	0.30
Social (MPAM-R)	-0.19	0.05	-0.28	0.00	-0.28	-0.10
Model: Intrinsic Motivation	0.20					
Vigorous-intensity activities	0.001	0.001	0.32	0.00	0.00	0.00
Purpose in life	0.27	0.04	0.26	0.00	0.19	0.35
Gender	0.22	0.09	0.10	0.01	0.05	0.40
Model: Intrinsic Motivation (Female)	0.18					
Vigorous-intensity activities	0.001	0.001	0.33	0.00	0.00	0.00
Purpose in life	0.24	0.06	0.22	0.00	0.13	0.35
Model: Intrinsic Motivation (Male)	0.22					
Purpose in life	0.31	0.06	0.34	0.00	0.18	0.43
Vigorous-intensity activities	0.001	0.001	0.31	0.00	0.00	0.00

Table 2: Linear regression analysis of physical activity, psychological well-being, and intrinsic motivation. (Granero-Jiménez et al., 2022))

	Cohort 1	Cohort 2	Cohort 3	Cohort 4	Combined Samples
<i>n</i>	193	543	379	284	1399
% female (<i>n</i>)	50.8 (98)	51.6 (280)	100 (379)	100 (284)	74.4 (1041)
% non-white (<i>n</i>)	44 (85)	13.1 (71)	6.9 (26)	12.3 (35)	15.5 (217)
Median education category	Some college or associates degree	Some college or associates degree	College graduate	Some college or associates degree	Some college or associates degree
Median income category	\$15,000–19,000	\$30,000–39,999	\$50,000–59,999	\$50,000–59,999	\$40,000–49,999
Median birth Year	1964	1932	1937	1950	1937
PEAT score (SD)	22.20 (5.85)	21.15 (5.68)	23.47 (5.35)	21.87 (5.40)	22.11 (5.63)
Cronbach's α	0.72	0.68	0.65	0.66	0.68

Table 3: Characteristics of Each Study Participant Sample and the Combined Sample (Pressman & Matthews, 2009)

Literature Review:

2.1. Definition of motor disability

Motor disability occurs when an individual cannot move or engage in physical activities due to neurological or musculoskeletal impairments. This broad category includes conditions such as cerebral palsy, motor disorders, physical disabilities, vision impairments, intellectual disabilities, and hearing loss. These disabilities often hinder mobility, coordination, and participation in physical activities and sports. Research shows that physical activity significantly enhances the well-being of individuals with disabilities. Studies highlight that engaging in physical activity improves the quality of life for people with intellectual and developmental disabilities (IDD). Physical activity positively impacts personal development, overall health, emotional well-being, and life satisfaction. For individuals with motor disabilities, the connection between physical activity and motor development is crucial. Motor competence is a key factor in lifelong participation in physical activities. Research demonstrates that higher proficiency in motor skills is linked to increased physical activity, and this association strengthens as children transition into adolescence and adulthood.

In people with neuropsychiatric disorders, like autism, leisure activities such as team sports, indoor climbing, or museum visits can enhance emotional well-being. However, since team sports might present social challenges for individuals with autism, alternative exercises like swimming, jogging, walking, and horse riding are recommended to encourage participation. In conclusion, understanding the barriers to physical activity for individuals with motor disabilities is essential. Exploring how physical activity affects psychological well-being through adapted sports programs or personalized exercise routines can greatly improve their quality of life. (Diz et al., 2024), (Grossi, 2024), (Jacinto et al., 2023) and (III & HD, 2013).



Figure 1: Snapshot of a subject climbing in the gym. (Grossi, 2024)



Figure 2: Members of the Physical Activity and Health Lab (Physical Activity & Health Laboratory, 2024)

2.2. Importance of physical activity for individuals with disabilities

Engaging in physical activities plays a critical role in improving the quality of life for individuals with disabilities. Evidence strongly suggests that participation in sports and physical activity promotes both physical and mental well-being. For children and adolescents with disabilities, involvement in sports enhances perceived competence, self-confidence, and self-esteem. Furthermore, adolescents who engage in team sports often experience better mental health outcomes later in life, especially those who have faced adverse childhood experiences. Participation in physical activity, exercise, and

sports programs has been shown to enhance the quality of life for individuals with intellectual and developmental disabilities (IDD). Research indicates that individuals with IDD who participate in these programs report higher levels of personal development, physical well-being, and emotional well-being. Additionally, physical activity has been associated with a reduced risk of depressive symptoms in individuals with disabilities.

Sports therapy is now recognized as a valuable treatment for various psychological conditions. Those who regularly participate in sports experience decreased symptoms of anxiety and depression, enhanced mood, improved self-esteem, better social skills, and more effective coping mechanisms for stress. These benefits underscore the importance of integrating sports into rehabilitation programs for individuals with disabilities.

Promoting physical activity through sports can significantly improve the psychological well-being of individuals with disabilities. By incorporating sports into rehabilitation programs tailored for children and teens with motor disabilities (ages 10-18), there is potential to improve their mental health outcomes and overall quality of life. More research is needed to fully understand the impact of sports on mental health services, and further studies should focus on this area. (Diz et al., 2024), (Jacinto et al., 2023), (Martín-Rodríguez et al., 2024) and (ODPHP, 2021).

2.3. Previous research on the psychological benefits of sports for disabled individuals

Previous research has shown that sport participation contributes to the psychological well-being of individuals with disabilities. Sports, when combined with therapeutic practices like CBT or DBT, have shown promising results for addressing various psychological issues. Regular participation in sports helps reduce symptoms of anxiety and depression, improves mood, and enhances self-concept. Structured sports activities provide essential coping mechanisms for managing stress and anxiety, particularly for individuals with PTSD. Team sports, in particular, offer social support and a sense of solidarity,

which can be beneficial for those dealing with PTSD.

In relation to ADHD, sports and exercise have long been recognized for improving cognitive function, attention span, and minimizing impulsive behaviors. Team sports offer dual benefits for children with ADHD: they help improve physical health while also enhancing social skills and self-esteem.

For individuals with intellectual disabilities, research indicates that sports-based programs like soccer can significantly reduce depressive symptoms. Physical activity in a supportive environment can help maintain good health and improve the quality of life for those with special needs.

Overall, studies suggest that sports participation offers significant mental health benefits for individuals with disabilities. The structured nature of sports not only provides physical benefits but also delivers emotional support, social connection, and a sense of purpose, making it a valuable therapeutic tool for improving psychological health. (Eime et al., 2013), (Jacinto et al., 2023) and (Martín-Rodríguez et al., 2024).

Theoretical framework

3.1. The relationship between physical activity and psychological well-being

Daily exercise can benefit your physical and mental health, with many studies showing positive impacts on psychological well-being. Continuous physical activity not only improves emotional control but also promotes resilience and cognitive function, breaking the traditional separation between body and mind. Physiologically, just like antidepressant medications that improve synaptic transmission of monoamines, exercise releases endorphins. This results in better mood, peace of mind, and enhanced cognitive abilities. Mentally, exercising offers diversion from negative experiences, boosts self-esteem, and encourages social interactions through activities like team sports or group fitness classes.

Research suggests a connection between physical activity levels and psychological well-being in young adults. Exercise is linked to greater

intrinsic motivation and improved mental health. Increased physical activity is associated with better psychological well-being, emphasizing the importance of understanding why individuals participate in sports. This understanding helps foster commitment to physical activity and enhances its mental health benefits.

The relationship between physical activity and well-being is multifaceted, involving neurobiological changes and psychological factors such as self-confidence and social bonding. Recognizing these associations is vital for developing interventions that enhance mental health through sports participation. Further research is needed to explore how physical activity can promote mental well-being across different age groups and populations.

(Granero-Jiménez et al., 2022), (Martín-Rodríguez et al., 2024) and (III & HD, 2013).

3.2. Impact of sports on self-esteem, anxiety, and emotional well-being in individuals with disabilities

Participation in sports increases self-esteem and enhances the mental health of individuals with disabilities. Young people involved in sports experience higher self-esteem, confidence, and perceived competency, which ultimately lead to better overall mental health. Participation in team sports during youth has been associated with lower levels of anxiety and depression in adulthood, highlighting the long-term emotional benefits of sports. Exercise, particularly sports, positively impacts mood and stress management. It releases neurotransmitters and endorphins that naturally improve mood and alleviate depressive symptoms, while also reducing cortisol levels, which helps lower stress and anxiety. Additionally, the social interactions and self-esteem boosts from sports provide emotional support, leading to better emotional control and overall well-being.

The psychosocial benefits of sports for children and teenagers are numerous. These include increased self-esteem, better emotional regulation, enhanced resilience, positive emotional experiences, improved social interaction skills, teamwork capabilities, and reduced social anxiety. All of these contribute to improved mental health and overall well-being.

In summary, sports are crucial for enhancing self-esteem, reducing anxiety, and improving emotional well-being among individuals with disabilities. By offering opportunities for physical activity, social engagement, skill development, and emotional support, sports play a vital role in promoting psychological well-being. Including sports in rehabilitation programs can significantly improve mental health outcomes and quality of life for individuals with disabilities.

(Eime et al., 2013), (Martín-Rodríguez et al., 2024) and (ODPHP, 2021).

Methodology

4.1. Selection criteria for participants

Participant	Selection	Criteria
Selecting participants for studying the impact of physical activity on the psychological well-being of individuals with disabilities aged 10-18 is crucial. The Delphi process for leisure-rehabilitation activities in pediatric neuropsychiatric rehabilitation, particularly autism, requires expertise. Specialists with at least 10 years of experience are necessary to provide valuable insights into this target demographic. Inclusion criteria should focus on intervention studies involving exercise programs and sports tailored to individuals with disabilities. These studies should assess depressive symptoms using validated methods and include diverse participants across age groups, genders, races, and ethnicities to gather relevant data on how physical activity influences mental health outcomes. Furthermore, while this research focuses primarily on physical and mental health, the importance of human subjects in intervention studies aimed at improving health outcomes through nature-based approaches should not be overlooked. Selecting participants based on similar criteria can be helpful in examining the benefits of physical activity on psychological well-being. In conclusion, selecting participants with expertise in neuropsychiatric rehabilitation and focusing on exercise programs for individuals with disabilities is essential for reliable and valid results. Following these guidelines will yield meaningful		

insights, contributing to future research and enhancing mental health services for individuals with disabilities. (MPH et al., 2023), (Grossi, 2024) and (Jacinto et al., 2023).

4.2. Data collection methods

Several different methods of data collection were used to examine physical activity levels and mental well-being among individuals with disabilities aged 10-18. Demographic data such as age, gender, education, weight, height, and Body Mass Index (BMI) were collected to establish participant profiles. The study used the Spanish version of the International Physical Activity Questionnaire (IPAQ) short-form to assess physical activity levels, including walking days, moderate- and vigorous-intensity activities over the past week. Physical activity was categorized into low, moderate, and high levels based on METs minutes/week, giving a comprehensive overview of participants' exercise habits in relation to their mental well-being.

Additional data were gathered using established questionnaires like the Health Survey for England and the EPIC Short Physical Activity Questionnaire, which evaluated activity levels in work and leisure contexts. Self-reported physical activity was also measured using the Children's Physical Activity Scale (CPA), consisting of 15 statements on participation in sports and other activities. These tools provided valuable insights into the complex relationship between physical activity and mental well-being in individuals with disabilities.

4.3. Data analysis techniques

The relationship between physical activity and mental well-being was analyzed using various methods. Linear regression was applied to examine the connection between initial mental well-being and average physical activity levels over time. Generalized linear mixed effect models assessed how initial mental well-being influenced repeated measures of physical activity, while Cox proportional hazards models evaluated changes in physical activity based on initial mental well-being.

These analyses considered demographic and health-related factors, including age, gender, ethnicity, socioeconomic status, and depression levels. The study analyzed mental well-being as

both a continuous and categorical variable. It also examined different intensity levels of physical activity, ranging from inactive to high-intensity engagement. Additionally, a Delphi approach was used in a workshop with expert therapists to evaluate recreational rehabilitation activities for improving psychological responses in children with neuropsychiatric disorders.

By employing a combination of analytical techniques and methodologies, the research provides clear insights into how physical activity influences mental health outcomes in individuals with disabilities. The findings are significant for informing future research and developing intervention programs to enhance mental health through sports and recreational activities.

Results

5.1. Overview of the study sample

A study of 8,636 Irish adolescents aged 10-17 found that boys and younger adolescents demonstrated better mental health profiles with lower problem scores compared to girls and older adolescents. Boys had higher participation rates in moderate-to-vigorous physical activity (MVPA) and vigorous physical activity (VPA), which correlated with improved life satisfaction, well-being, and overall mental health across all age groups. In contrast, girls exhibited poorer mental health outcomes, with higher scores on the Mental Health Inventory-5 (MHI-5) and the Health Behaviour in School-Aged Children Symptoms Check List (HBSC-SCL).

In a separate study of young adults, 55.83% engaged in regular exercise, primarily motivated by friends. Higher physical activity levels were associated with better psychological well-being, particularly among males, who showed higher Body Mass Index (BMI), greater overall physical activity, and stronger exercise motivation than females.

Additionally, research on self-esteem and physical activity revealed that participants' average BMI fell within the overweight range, yet their Body Image (BI) scores remained normal. Despite high

levels of physical activity, self-esteem scores varied significantly among individuals.

These findings highlight the complex relationship between physical activity, psychological well-being, and demographic factors like age and

gender, demonstrating how these elements impact mental health outcomes in different groups.

(Granero-Jiménez et al., 2022), (Molcho et al., 2021) and (Sani et al., 2016).

Physical Activity Indicators	MVPA ¹	VPA ²
	M (SD)	M (SD)
All	5.47 (1.97)	21.10 (10.80)
Boys	5.81 (1.90)	22.75 (11.00)
Girls	5.17 (1.98)	19.63 (10.45)
	<i>p</i> < 0.001	<i>p</i> < 0.001
10–11	6.36 (1.73)	22.95 (10.67)
12–14	5.63 (1.90)	21.40 (16.68)
15–17	4.79 (1.95)	19.73 (10.87)
	<i>p</i> < 0.001	<i>p</i> < 0.001
Boys		
10–11	6.53(1.65)	23.56(10.86)
12–14	5.90(1.85)	22.88(10.89)
15–17	5.26(1.95)	22.10(11.12)
	<i>p</i> < 0.001	<i>p</i> < 0.05
Girls		
10–11	6.19(1.80)	22.32(10.45)
12–14	5.39(1.92)	20.11(10.33)
15–17	4.43(1.88)	17.84(10.28)
	<i>p</i> < 0.001	<i>p</i> < 0.001

Table 4: Indicators of physical activity by intensity, gender and age group. (Molcho et al., 2021))

Mental Health Indicators	Life Satisfaction	WHO-5 ¹ Wellbeing	MHI-5 ² Mental Health	HBSC-SCL ³ Symptoms
	M (SD)	M (SD)	M (SD)	M (SD)
All	7.44 (1.82)	57.87 (23.32)	29.62 (19.59)	16.51 (6.67)
Boys	7.54 (1.72)	61.39 (22.04)	25.59 (17.37)	15.06 (5.71)
Girls	7.35 (1.90)	54.82 (24.00)	33.13 (20.71)	17.77 (7.16)
	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> < 0.001
10–11	8.28 (1.64)	69.52 (21.53)	21.62 (15.81)	13.65 (5.29)
12–14	7.56 (1.80)	59.14 (22.93)	28.82 (19.30)	16.20 (6.57)
15–17	6.85 (1.74)	50.32 (22.00)	34.73 (20.18)	18.37 (6.84)
	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> < 0.001
Boys				
10–11	8.23 (1.60)	69.61 (21.15)	20.88 (14.73)	33.73 (5.57)
12–14	7.64 (1.72)	61.72 (21.78)	25.05 (17.52)	32.30 (6.16)
15–17	6.99 (1.62)	56.20 (21.43)	29.07 (17.83)	31.24 (6.06)
	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> < 0.001	<i>p</i> < 0.001
Girls				
10–11	8.32 (1.68)	69.42 (21.93)	22.38 (16.84)	33.20 (6.28)

12–14	7.49 (1.87)	56.90 (23.67)	32.09 (20.16)	29.93 (7.31)
15–17	6.73 (1.83)	45.64 (21.27)	39.23 (20.81)	27.50 (7.17)
	$p < 0.001$	$p < 0.001$	$p < 0.001$	$p < 0.001$

Table 5: Indicators of wellbeing and mental health by gender and age group. (Molcho et al., 2021))

Variable		<i>n</i>	%
IPAQ	Low level	99	20.25
Moderate level	174	35.58	
High level	216	44.17	
Variable		SD	
IPAQ	3701.39	3954.06	
Ryff Psychological Well-Being	4.47	0.69	
MPAM-R	3.39	0.76	

Table 6: Outcome measures of the study sample. (Granero-Jiménez et al., 2022))

Variable	Overall	High Level	Moderate Level	Low Level	Z	<i>p</i>	Post Hoc Test
<i>n</i> = 489	<i>n</i> = 216	<i>n</i> = 174	<i>n</i> = 99				
Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD				
Age	22.42 ± 3.27	22.33 ± 3.26	22.72 ± 3.37	22.12 ± 3.13	1.21	0.3	
BMI	23.63 ± 4.56	24.18 ± 5.22	23.17 ± 3.81	23.26 ± 4.09	2.83	0.06	
IPAQ							
Walking	1491.31 ± 1859.72	2560.07 ± 2302.77	936.80 ± 599.30	134.07 ± 173.78	97.31	<0.001 ***	HL > LL
HL > ML							
ML > LL							
Moderate-intensity activities	790.72 ± 1386.99	1541.06 ± 1781.85	302.18 ± 434.56	12.24 ± 30.64	75.77	<0.001 ***	HL > LL
HL > ML							
Vigorous-intensity activities	1419.29 ± 2104.28	2849.96 ± 2453.95	445.98 ± 597.75	8.48 ± 60.01	143.99	<0.001 ***	HL > LL
HL > ML							
Ryff	4.47 ± 0.69	4.56 ± 0.68	4.43 ± 0.65	4.29 ± 0.73	11.73	<0.001 ***	DL > LL
Self-acceptance	4.26 ± 0.93	4.35 ± 0.94	4.28 ± 0.86	4.06 ± 1.02	7.76	0.021 *	
Positive relations	4.58 ± 1.03	4.65 ± 0.99	4.54 ± 1.03	4.49 ± 1.11	1.66	0.437	
Autonomy	4.35 ± 0.83	4.40 ± 0.85	4.36 ± 0.78	4.22 ± 0.88	4.76	0.093	
Environmental mastery	4.33 ± 0.83	4.43 ± 0.78	4.34 ± 0.83	4.11 ± 0.87	9.83	0.007 *	

Purpose in life	4.80 ± 0.76	4.63 ± 0.95	4.44 ± 0.96	4.24 ± 1.03	11.33	0.003 *	
Personal growth	4.48 ± 0.98	4.90 ± 0.75	4.79 ± 0.73	4.60 ± 0.78	13.17	<0.001 ***	
MPAM-R	3.39 ± 0.76	3.66 ± 0.62	3.26 ± 0.72	3.03 ± 0.89	30.82	<0.001 ***	HL > LL
HL > ML							
ML > LL							
Enjoyment	3.48 ± 1.06	3.87 ± 0.91	3.29 ± 1.00	2.96 ± 1.15	57.65	<0.001 ***	
Appearance	3.43 ± 0.96	3.55 ± 0.91	3.40 ± 0.95	3.21 ± 1.06	7.8	0.020 *	
Social	2.54 ± 0.97	2.76 ± 0.95	2.34 ± 0.94	2.41 ± 0.97	19.13	<0.001 ***	
Fitness	4.08 ± 0.85	4.33 ± 0.65	4.02 ± 0.85	3.65 ± 1.02	38.73	<0.001 ***	
Competence	3.43 ± 1.06	3.80 ± 0.92	3.24 ± 1.01	2.94 ± 1.13	53.32	<0.001 ***	
Intrinsic Motivation	3.45 ± 1.01	3.83 ± 0.87	3.27 ± 0.95	2.95 ± 1.10	35.15	<0.001 ***	HL > LL
HL > ML							
ML > LL							
Extrinsic Motivation	3.35 ± 0.71	3.55 ± 0.61	3.25 ± 0.67	3.09 ± 0.84	17.8	<0.001 ***	HL > LL
HL > ML							
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>X</i> ²	<i>p</i>		
Gender							
Female	132 (40%)	122 (37%)	76 (23%)	8.44	0.02 *		
Male	84 (52.8%)	52 (14.5%)	23 (32.7%)				
Educational Level				9.76 **	0.09		
Primary Education	11 (50%)	7 (31.8%)	4 (18.2%)				
Lower Secondary Education	83 (44.6%)	55 (29.6%)	48 (25.8%)				
Upper Secondary Education	122 (43.6%)	111 (39.6%)	47 (16.8%)				
No Education	0 (0%)	1(100%)	0 (0%)				

Table 7: Differences according to level of physical activity. (Granero-Jiménez et al., 2022))

Variable	Overall	Male	Female	Z	p
<i>n</i> = 489	<i>n</i> = 159	<i>n</i> = 330			
Mean ± SD	Mean ± SD	Mean ± SD			
Age	22.42 ± 3.27	22.56 ± 2.81	22.36 ± 3.48	-1.95	0.05
BMI	23.63 ± 4.56	24.21 ± 3.10	23.35 ± 5.09	-4.93	<0.001 ***
IPAQ	3701.39 ± 3954.06	4863.06 ± 4867.17	3141.56 ± 3293.54	-3.62	<0.001 ***
Walking	1491.31 ±	1702.51 ±	1389.55 ±	-1.35	0.18

	1859.72	2096.94	1728.12		
Moderate-intensity activities	790.72 ± 1386.99	1133.64 ± 1875.75	625.49 ± 1039.00	-3.23	0.001 ***
Vigorous-intensity activities	1419.29 ± 2104.28	2026.92 ± 2503.91	1126.52 ± 1814.57	-4.36	<0.001 ***
Ryff	4.47 ± 0.69	4.38 ± 0.74	4.51 ± 0.66	-1.85	0.06
MPAM-R	3.39 ± 0.76	3.50 ± 0.69	3.34 ± 0.78	-2.48	0.01 *
Intrinsic Motivation	3.45 ± 1.01	3.66 ± 0.92	3.35 ± 1.04	-2.99	<0.001 ***
Extrinsic Motivation	3.35 ± 0.71	3.40 ± 0.67	3.33 ± 0.73	-1.10	0.27

Table 8: Differences according to gender. (Granero-Jiménez et al., 2022))

Variable	M	SD	Range			
Potential	Actual	Skewness	Kurtosis			
Physical activity	10.19	0.50	0–18	8–12	0.19	1.09
Self-esteem	5.65	3.77	-10–10	-10–10	-1.05	1.53
Body image	5.26	1.79	1–9	1–9	-0.15	-0.58
Perceived physical fitness	39.39	4.98	12–60	28–57	0.21	0.30
Body mass index	25.66	3.79	<18.5–>30	17.16–40.09	0.92	0.30

Table 9: Descriptive statistics of the main study variables (Sani et al., 2016))

Variable		n	%
Gender	Female	330	67.48
	Male	159	32.52
Educational level	Primary Education	22	4.5
	Lower Secondary Education	186	38.04
	Upper Secondary Education	280	57.26
	No Education	1	0.2
BMI	Underweight	24	4.91
	Healthy	341	69.73
	Overweight	91	18.61
	Obese	33	6.75
Exercise	Yes	273	55.83
	No	216	44.2
People influencing exercise	Friends	239	48.9
	Family	168	34.4
	Partner	62	12.7
	Coworkers	20	4.1
Variable		SD	
	Age	22.42	3.27
	BMI	23.63	4.56

Table 10: Demographic characteristics of the study sample. (Granero-Jiménez et al., 2022))

Characteristic	Frequency	Percentage
Sex		
Women	77	29.2
Men	187	70.8
Education		
Undergraduate	45	17
Bachelor	74	28
Master, doctorate	145	55
Health status		
Without chronic illness	242	91.7
With chronic illness	22	8.3
Marital status		
Single	36	13.6
Married	209	79.2
Divorced	19	7.2
Smoking		
Yes	16	6.1
No	248	93.9

Table 11: Demographic characteristics (N =264 respondents) (Sani et al., 2016)

5.2. Statistical analysis of the data

Participating in physical activity plays a critical role in improving psychological well-being. Firstly, there is a strong correlation between physical activity and increased self-esteem. Studies by Pedersen (2004) and Erkut (2002) highlight how involvement in sports enhances confidence and self-worth, particularly among individuals with disabilities. Secondly, physical activity significantly reduces anxiety. For instance, research by Dimech (2011) found that sports participation can alleviate social anxiety, underscoring the importance of exercise for individuals dealing with anxiety-related issues. Thirdly, Mammen and Faulkner's work shows that regular exercise helps prevent depression by releasing endorphins and boosting neurotransmitters like serotonin and dopamine,

which improve mood and reduce anxiety symptoms.

Additionally, physical activity supports emotional well-being by fostering a sense of community and belonging, which counters feelings of loneliness often linked to depression and anxiety. Group fitness or team sports provide vital emotional support, and achieving exercise goals contributes to self-worth, improving mood and quality of life. These findings highlight the importance of incorporating physical activity into rehabilitation programs for individuals aged 10-18 with motor disabilities. Addressing self-esteem issues, reducing anxiety, and promoting emotional wellness through sports can greatly benefit their mental health and overall well-being.

(Eime et al., 2013) and (Martín-Rodríguez et al., 2024).

	Model 1	Model 2	Model 3	Model 4
Psychological well-being (per SD)	0.77 (0.74, 0.80) ^{sub-ref-*}	0.79 (0.76, 0.82) ^{sub-ref-*}	0.81 (0.78, 0.84) ^{sub-ref-*}	0.81 (0.78, 0.84) ^{sub-ref-*}
Age (per year)	1.05 (1.05, 1.06) ^{sub-ref-*}	1.05 (1.05, 1.05) ^{sub-ref-*}	1.05 (1.04, 1.05) ^{sub-ref-*}	1.05 (1.04, 1.05) ^{sub-ref-*}
Male sex	0.71 (0.67, 0.76) ^{sub-ref-*}	0.74 (0.70, 0.80) ^{sub-ref-*}	0.76 (0.72, 0.82) ^{sub-ref-*}	0.76 (0.72, 0.82) ^{sub-ref-*}
Non-white race	1.38 (1.05, 1.80) ^{sub-ref-*}	1.36 (1.04, 1.79) ^{sub-ref-*}	1.39 (1.05, 1.85) ^{sub-ref-*}	1.39 (1.05, 1.85) ^{sub-ref-*}

Income (per SD)		0.93 (0.86, 1.01) ^{sub-ref-†}	0.93 (0.86, 1.01) ^{sub-ref-†}	0.93 (0.86, 1.01) ^{sub-ref-†}
Education at Wave 1				
University degree		0.59 (0.51, 0.67) ^{sub-ref-*}	0.59 (0.51, 0.67) ^{sub-ref-*}	0.59 (0.51, 0.67) ^{sub-ref-*}
Higher education (no degree)		0.78 (0.70, 0.88) ^{sub-ref-*}	0.78 (0.70, 0.88) ^{sub-ref-*}	0.78 (0.70, 0.88) ^{sub-ref-*}
A level		0.84 (0.72, 0.99) ^{sub-ref-*}	0.85 (0.73, 1.00) ^{sub-ref-†}	0.85 (0.73, 1.00) ^{sub-ref-†}
O level		0.86 (0.78, 0.94) ^{sub-ref-*}	0.86 (0.79, 0.95) ^{sub-ref-*}	0.86 (0.79, 0.95) ^{sub-ref-*}
Less than O level		Ref	Ref	Ref
Chronic conditions			1.39 (1.29, 1.50) ^{sub-ref-*}	1.39 (1.29, 1.50) ^{sub-ref-*}
Depression				1.00 (0.85, 1.16)

Table 12: Cox time-to-event analysis. Hazard ratio (95% CI) of becoming sedentary or having low physical activity among participants with moderate or high physical activity at baseline (N=6,030). (Kim et al., 2017)

Discussion

Physical activity and mental well-being are closely intertwined, significantly influencing psychological health. Regular physical activity promotes the release of neurotransmitters like endorphins, serotonin, and dopamine, which help elevate mood and alleviate symptoms of depression and anxiety. Additionally, participating in sports fosters social interaction, essential for emotional health. Team sports and group fitness activities enhance social support, improve social skills, boost self-esteem, and provide a sense of accomplishment—benefits that are particularly valuable for individuals with disabilities, improving their quality of life.

Physical activity has also been shown to mitigate anxiety disorders by regulating the body's stress response. Exercise lowers cortisol levels, the stress hormone, while increasing endorphins that elevate mood. The therapeutic effects of sports on anxiety are supported by positive influences on physiological markers such as heart rate variability.

In rehabilitation settings, incorporating sports into clinical programs has effectively reduced depressive symptoms in individuals with disabilities. Activities that combine exercise and social interaction have proven to significantly

reduce depressive symptoms in those with intellectual disabilities. Including sports in rehabilitation plans for youth aged 10–18 with motor disabilities could greatly enhance their mental well-being.

In summary, the interplay of physiological, psychological, and social factors underscores the critical role of physical activity and sports in improving mental health. Understanding how physical activity impacts mood regulation offers a framework for designing rehabilitation programs that improve quality of life through sports participation.

Conclusion and Recommendations

7. Conclusion

7.1. Summary of key findings

A study titled "Sustaining Healthy Habits: An Ongoing Exploration of Mental Wellness and Physical Exercise" revealed that higher psychological well-being in older adults predicted engagement in moderate-to-vigorous physical activity (MVPA) over an 11-year period. Those with better mental well-being were less likely to become inactive or engage in low-intensity activities. Notably, individuals who started with a sedentary lifestyle but had higher mental well-being were more likely to increase their activity levels over time, reinforcing the idea that mental

wellness is a key motivator for sustaining physical activity.

Moreover, the relationship between mental well-being and physical activity remained even after accounting for chronic illnesses and depressive symptoms, showing that psychological health independently influences physical activity behaviors. Promoting mental health in conjunction with physical wellness may help motivate older adults to maintain active lifestyles, providing lasting benefits for both mental and physical health.

7.2. Recommendations for future research

Future studies on physical activity and mental well-being should include individuals with a wider range of disabilities, including severe intellectual and developmental disabilities (IDD), to ensure comprehensive and inclusive findings. Longitudinal and follow-up research is necessary to assess the long-term impacts of intervention programs on mental well-being. Using validated assessment tools for measuring quality of life (QoL) is crucial, and subgroup analyses by age, disability severity, and gender can provide more nuanced insights into the effects of physical activity on mental health.

Incorporating clinical and biological parameters, such as VO₂ assessments, can deepen the understanding of the physiological effects of sports interventions. Moreover, examining how different sports activities affect individuals at various life stages will enable researchers to create tailored intervention programs. Specifically, integrating sports into rehabilitation programs for youth aged 10-18 with motor disabilities can greatly enhance their physical fitness and overall wellness.

These recommendations will advance the understanding of how sports interventions can positively impact the mental health of individuals with disabilities and lead to improved outcomes.

8. Recommendations

Incorporating sports into rehabilitation programs for adolescents aged 10 to 18 with motor disabilities is essential for enhancing their overall well-being and quality of life. Supervised physical activities such as sports and physical education, guided by experts in sports science and disability, significantly improve the health and emotional

welfare of individuals with disabilities. Research suggests that leisure-rehabilitation activities, including team sports, indoor climbing, dramatherapy, and museum visits, benefit children with autism by fostering emotional, social, cognitive, and physical engagement.

Promoting physical activity among teenage girls is also vital for boosting self-esteem and body image during adolescence. Creating supportive environments that minimize body-related insecurities while encouraging physical activities is crucial. Regular physical activity helps reduce anxiety and depression, improves mood, and enhances mental well-being. Tailored programs addressing individual needs can further improve self-perception, social interactions, and self-confidence.

9. Impact and Future Directions

9.1. Potential impact on mental health services

Physical activity has been linked to mental health improvements, with participation in sports positively affecting emotional regulation, cognitive function, resilience, and the treatment of psychological conditions. Studies show that youth involved in sports have lower rates of suicidal thoughts, higher self-esteem, and improved emotional health. Team sports have been associated with reduced anxiety, depression, and better self-image.

Incorporating physical activity into rehabilitation programs for youth with motor disabilities could significantly enhance mental health services. Sports-based interventions can improve emotional regulation, cognitive function, resilience, and overall psychological health.

9.2. Suggestions for further studies in this area

Future research should explore how the sports environment facilitates positive mental health outcomes. Differentiating between the effects of leisurely and competitive physical activities could help customize interventions based on individual preferences. Studies should also examine the therapeutic benefits of physical activity for diverse patient groups and those with mental health-related impairments. Age-specific research would help tailor interventions that maximize mental health benefits across different life stages.

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