

# Proceedings of the International Seminar of Physical Education, Leisure and Health, 17-19 June 2019. Castelo Branco, Portugal

**Cite this article as:**

Proceedings of the International Seminar of Physical Education, Leisure and Health; Castelo Branco, Portugal. (2019). *Journal of Human Sport and Exercise*, 14(4proc), S1169-S1823.  
doi:<https://doi.org/10.14198/jhse.2019.14.Proc4.82>

Table of Contents

Muscle soreness and fatigue and their associations with internal and external load measures in professional soccer players .....	1181
Internal and external training load associations in professional soccer players .....	1185
Comparison of motivational factors for the practice of exercise at gyms and nature and adventure sports .....	1189
Association of physical activity, self-concept and self-efficacy in high school students.....	1193
Effect of the Internet and online social media on awareness of ACSM physical activity recommendations .....	1197
Physical activity level and perceptions about exercise in patients with Osteoporosis .....	1201
Parental perceptions of physical activity benefits for children with autism spectrum disorders ...	1205
Relationship of intrinsic motivation towards sport, with variables related to a healthy lifestyle....	1209
Differences between gender and population groups, motivational variables and healthy lifestyles .....	1213
Short-term effects of myofascial release on isometric knee extensors strength .....	1217
Iron, phosphorus and magnesium erythrocyte concentrations in men with a high, moderate or low level of physical training .....	1221
Possible relationship between some trace metals and the hormone insulin in high-level athletes .....	1225
Erythrocyte concentrations of chromium, manganese and zinc in men with a high, moderate or low level of physical training .....	1228

<b>Arsenic, cadmium and lead erythrocyte concentrations in men with a high, moderate or low level of physical training</b> .....	1231
<b>Cyberbullying in school: A literature review</b> .....	1235
<b>The effects of a mind-body program on the cognomotor performance of high school children</b> ....	1239
<b>Ethical issues on military physical conditioning</b> .....	1242
<b>Relationships between psychological skills and European U19 rugby union tournament outcomes and performance indicators</b> .....	1246
<b>Physical performance tests and anthropometric data to predict selection in U19 rugby union players</b> .....	1250
<b>Physical exercise in higher education: Knowledge, attitudes and practices</b> .....	1254
<b>Nutritional knowledge and eating attitudes and habits in higher education</b> .....	1258
<b>Comparisons of external load variables between small-sided and real format games: An 8-week study in professional soccer training context</b> .....	1262
<b>Volleyball selection process: How do coaches select?</b> .....	1266
<b>The importance of attitudes and values in sport and competition: The opinion of a group of coaches of Volleyball</b> .....	1270
<b>Short-term effects of myofascial release on isometric knee extensors strength</b> .....	1273
<b>Digital media in professional basketball: The case of supporters of the Hamburg Towers</b> .....	1277
<b>Planning and assessment by teachers of physical education classes in elementary school</b> .....	1280
<b>Pedagogical model for teaching combat sports in physical education class: Presentation of partial results</b> .....	1283
<b>Intra-week variations and associations between internal and external load measures in a elite volleyball team</b> .....	1286
<b>Frequency of sports participation, body image satisfaction and psychological well-being: Gender differences among vocational students</b> .....	1290
<b>Analysis of physical-sport motivations in adolescents according to gender, age and BMI</b> .....	1294
<b>Olympism: Level of knowledge between different University Degrees in the Faculty of Education. Differences by gender and University Degree</b> .....	1298
<b>Academic routine impact on physical activity level of university students: A longitudinal study</b> .	1302
<b>Cooperative games vs competitive games in Primary School Education: What effects do they have on schoolchildren motivation?</b> .....	1305
<b>Physical activity index for Galician schoolchildren of primary school education according to age and gender</b> .....	1308
<b>Fitness professionals: Narrative review</b> .....	1311
<b>Competence towards Physical Education inclusion: Self-perception of Galician future teachers of Primary School Education</b> .....	1315
<b>Principal complaints and reference to spine pain in young tennis players during a tournament: Data from massage therapy care</b> .....	1319

<b>Terminal actions at Brazilian’s Volleyball League .....</b>	<b>1322</b>
<b>Effects of a training program in post-menopausal women .....</b>	<b>1326</b>
<b>“Destroying stereotypes, building on equality”: Didactic intervention with Master in Teaching of Physical Education students.....</b>	<b>1330</b>
<b>Perception of primary school children about the playful and sport practice .....</b>	<b>1334</b>
<b>Socio-demographic characteristics of nursing students and the prevalence of physical activity .....</b>	<b>1338</b>
<b>Inequalities in female combat sports .....</b>	<b>1342</b>
<b>Evaluation of coordinated motor ability in handball players .....</b>	<b>1346</b>
<b>How assessment the flexibility in handball players? Results of a systematic review .....</b>	<b>1349</b>
<b>Evaluation of urinary protein and creatinine concentration in athletes after high-performance physical exercise .....</b>	<b>1353</b>
<b>Lipid profile and associated factors among an academic community of Higher Education .....</b>	<b>1356</b>
<b>Sociological analysis of three dual combat practices in Portugal: The case study of aikido, judo and wrestling.....</b>	<b>1360</b>
<b>Comparison of propulsive forces between two head-out water exercises.....</b>	<b>1364</b>
<b>Experiences of bullying in education and school paths.....</b>	<b>1368</b>
<b>Insights on a sucessfull research-to-practice partnership with Matosinhos city hall: The case of surfing in schools .....</b>	<b>1372</b>
<b>Levels of insufficient health-related physical activity in Portuguese adolescents .....</b>	<b>1375</b>
<b>Gender differences in psychosocial benefits of physical activity and sports participation in youth .....</b>	<b>1379</b>
<b>Watching overweight: Monitoring in child health consultations.....</b>	<b>1383</b>
<b>An aesthetic reflection in school sports: Notes on the participation of the sportive delegation of Campus Santo Ângelo in the student games of IF Farroupilha (JEIF) .....</b>	<b>1387</b>
<b>Self-perception of life quality and the practice of physical activity in elderly.....</b>	<b>1391</b>
<b>Anthropometric, somatotype and physical profile of young female roller skaters .....</b>	<b>1395</b>
<b>Functional physical fitness in elderly: Differences depending on the practice of physical activity .....</b>	<b>1399</b>
<b>Physical activity levels in adults with intellectual disabilities: The importance of physical education .....</b>	<b>1403</b>
<b>A comparison of physical fitness by competitive levels in youth basketball players .....</b>	<b>1407</b>
<b>Present and future of the soccer specialists perfomance.....</b>	<b>1411</b>
<b>Evaluation of physical activity status and cognitive function among breast cancer patients: A cross-sectional study .....</b>	<b>1415</b>
<b>Physical conditioning of U16 national team players: Mediator effect of previous sport experiences and strength and conditioning practices .....</b>	<b>1419</b>

<b>Evaluation of the efficacy of a sensorimotor program in the development of children in swimming lessons .....</b>	<b>1423</b>
<b>Relationship between physical education, school satisfaction, psychological well-being and academic achievement in vocational students .....</b>	<b>1427</b>
<b>Water aerobics: The use of wearables.....</b>	<b>1430</b>
<b>Influence of the full squat on short sprint performance in young adults .....</b>	<b>1433</b>
<b>Effect of previous ankle sprain in stride variables during basketball-specific drill: Insights about maturity offset .....</b>	<b>1437</b>
<b>Is low volume HIIT enough to induce changes in oxygen uptake kinetics?.....</b>	<b>1441</b>
<b>Warm-up kinematics influence in 30m sprint performance.....</b>	<b>1445</b>
<b>Bioelectrical impedance vector displacement and phase angle: Prognostic tools for swimmers? .....</b>	<b>1449</b>
<b>Jumping in the Brazilian Women's Volleyball “B” Super-league .....</b>	<b>1453</b>
<b>Smartphone fitness applications used by runners: For what reason? .....</b>	<b>1457</b>
<b>The educative role of judo for children in first-cycle primary school: Parents' opinion based on focus group.....</b>	<b>1461</b>
<b>The development of emotional self-emotion in volleyball project "AVP SOCIAL": Under19 athletes perspective.....</b>	<b>1465</b>
<b>Self-determined motivation and subjective well-being in Portuguese veteran athletes in different sports .....</b>	<b>1469</b>
<b>Self-determined motivation and subjective well-being of adapted sport athletes members of Special Olympics .....</b>	<b>1473</b>
<b>Monitoring workload in women's basketball based on player tracking device.....</b>	<b>1477</b>
<b>The athlete’s perception of parents behaviors in sport context: A study in youth handball players of the Madeira Handball Association.....</b>	<b>1481</b>
<b>Fair play : The perception of the young handball players on the parent’s behavior.....</b>	<b>1485</b>
<b>The importance of imagery in acquiring and improving motor skills and sports technique .....</b>	<b>1489</b>
<b>Comparing differences in motor proficiency of children with and without Autism spectrum disorders .....</b>	<b>1492</b>
<b>Pre-service physical education teachers tasks load vs. tactical game approach tasks load: A case study .....</b>	<b>1495</b>
<b>Comparative analysis of interlimb asymmetry in a RSA Test in basketball players .....</b>	<b>1499</b>
<b>Analysis of the action of penalty and double-penalty in football for blind people .....</b>	<b>1503</b>
<b>Loopboard: Device for acrobatics training in sliz sports .....</b>	<b>1507</b>
<b>Health education in patients with rheumatoid arthritis: A pilot education program .....</b>	<b>1510</b>
<b>Voluntary sports clubs and the participation of young refugees with uncertain perspective of staying: Access barriers and challenges .....</b>	<b>1514</b>

<b>In-season internal training load quantification of an under-17 European male soccer team: Starters versus Non-starters</b> .....	1518
<b>Pre-season and in-season internal training load quantification of one-week schedules in under-17 European soccer team</b> .....	1522
<b>Bullying among medical students: Integrative literature review</b> .....	1526
<b>Perceived motivational climate and goal orientation in soccer athletes: A longitudinal perspective</b> .....	1529
<b>Bullying victimization and family interactions of Brazilian students: A mixed study</b> .....	1533
<b>Habitual physical activity patterns of pre-school children from Bragança</b> .....	1537
<b>The (In)discipline: Playtherapy as prevention</b> .....	1541
<b>Students' opinion on Physical Education and School: An association with academic performance</b> .....	1545
<b>The curricular identity of Physical Education: New perspective</b> .....	1548
<b>The effect of combining general warm-up with specific warm-up in bench press performance</b> ....	1552
<b>The importance of workplace health management in the context of skills shortage in small and medium-sized companies</b> .....	1556
<b>Case study of the programs for soccer teaching of two teachers in training versus the Tactical Game Approach model</b> .....	1559
<b>Social and personal skills in Physical Education: teachers and students' preception about an intervention program</b> .....	1563
<b>Is VO<sub>2</sub> kinetics influenced by swimming intensity in maximal and supramaximal velocities in young female swimmers?</b> .....	1566
<b>Training and leadership profile in adapted sport coaches and the implication in athletes with intellectual disabilities</b> .....	1570
<b>Adapted sports: An experience for initial skills development of sport professionals</b> .....	1574
<b>Perceived barriers and physical activity levels in older adults: The role of education</b> .....	1578
<b>Supervised vs. non-supervised physical activity: The impact on functional fitness in older adults</b> .....	1582
<b>Playfulness in education: A systematic review</b> .....	1586
<b>The 2019 Special Olympics World Games experience: Perspective of athletes who participated</b> .	1590
<b>The importance of sports to the Inclusive Research Group of APPACDM Castelo Branco</b> .....	1593
<b>Adapted sports: Curricular traineeship</b> .....	1596
<b>The observation: Adapted table tennis</b> .....	1600
<b>Changing elderlies strength levels with a four months multicomponent training program</b> .....	1604
<b>Bone mineral density and muscle strenght in elderly: A cross-sectional study</b> .....	1608
<b>Effects of a multicomponent exercise program with duration of 12 weeks on the quality of life in breast cancer survivors</b> .....	1612

<b>Orienteering sport and environmental education: A theoretical review</b> .....	1620
<b>Evaluation of the quality of life of schoolchildren of the EJA in the Municipality of Itacoatiara, Amazonas</b> .....	1624
<b>Is performance in basketball referees affected by gender?</b> .....	1628
<b>Associations of physical activity with body composition and aerobic capacity in adults with Down syndrome</b> .....	1632
<b>Differences on body composition and biochemical parameters between practitioners and non-practitioners of soccer</b> .....	1636
<b>Which factors are related with coaches' perception of young soccer players competence: Physical fitness, motor coordination or specific skill?</b> .....	1639
<b>Sports attitudes of young people practicing orienteering: The influence of the additional practice of another sport</b> .....	1643
<b>The thinking process of Football coaches: The training factors</b> .....	1647
<b>Differences of Imagery ability between youth soccer and swimming practitioners</b> .....	1651
<b>Comparison of physical fitness between young and middle-aged adults</b> .....	1655
<b>Adherence to physical activity guidelines and body composition in elderly people using objective measurements</b> .....	1659
<b>Correlation between pulmonary function and aerobic capacity in middle-aged adults</b> .....	1663
<b>Exploring relative age effect and maturity status on physical performance of school-age children</b> .....	1667
<b>Push-ups with hands or feet on unstable surface: Does it affects muscle activation and ground reaction forces?</b> .....	1670
<b>Correlation between vertical stiffness and agility performance in sport students</b> .....	1674
<b>Parental involvement in health promotion programs during pre-school aged children: A systematic review</b> .....	1678
<b>Motor development in children from 12 to 46 months: Influence of the variable “<i>type of breastfeeding</i>”</b> .....	1682
<b>Physiological responses at maximal aerobic swimming pacing in different distance-trials</b> .....	1686
<b>What do students think in physical education?</b> .....	1690
<b>Leisure-time physical activity and food consumption among Brazilian university students</b> .....	1693
<b>Motor imagery and music: The influence of music on mental rotation of bodily-related pictures</b> .	1696
<b>Study of differences in motor coordination, comparing individuals with eutrophic and overweight, with Intellectual Disability</b> .....	1700
<b>Validity and applicability of a web and mobile application to control the physical recovery of athletes</b> .....	1704
<b>Motor imagery and music: A function of arousal?</b> .....	1707
<b>Effects of a physical exercise program on body composition and functional physical fitness in the elderly</b> .....	1711

<b>Quality of life of Nursing students: Relationship with the level of Physical Activity .....</b>	<b>1715</b>
<b>Motor skills in childhood: From the family perceptions to the practices of the children .....</b>	<b>1719</b>
<b>Association between body composition and functional physical fitness in the elderly population .....</b>	<b>1723</b>
<b>Correlation between sedentary behavior, physical activity and lung function in the elderly .....</b>	<b>1727</b>
<b>Study of the relationship between global motor skills, fine motor skills and age .....</b>	<b>1731</b>
<b>Functional exercise vs aquafit for seniors .....</b>	<b>1735</b>
<b>Effects of a senior exercise program on functional capacity in institutionalized elderly in the municipality of Mação .....</b>	<b>1739</b>
<b>Comparison of physical fitness tests and special judo fitness test performance and classificatory tables development for juvenile and cadet male athletes .....</b>	<b>1743</b>
<b>Postural stability and handgrip strength in the older adults: Differences between fallers and non-fallers .....</b>	<b>1747</b>
<b>Fine motor skills: An emergent competence in preschool age .....</b>	<b>1751</b>
<b>Physical education in primary school: From perceptions to practices .....</b>	<b>1755</b>
<b>Physical fitness level of a population with mild cognitive impairment .....</b>	<b>1758</b>
<b>The sports practice of karate in Portugal: Sociological analysis of the identities, ideologies, communities and cultures of the Portuguese karateka's (brown and black belts) .....</b>	<b>1762</b>
<b>Portuguese play report 2018: Children up to 10 years .....</b>	<b>1765</b>
<b>Prevalence of Methicillin - Resistant Staphylococcus Aureus in students of higher education.....</b>	<b>1768</b>
<b>Risk factors and arterial hypertension .....</b>	<b>1772</b>
<b>The importance of the electrocardiogram in the competitive pre-period.....</b>	<b>1776</b>
<b>Excess weight and obesity in a region of the interior of Portugal .....</b>	<b>1780</b>
<b>Venous insufficiency and sedentary job activity .....</b>	<b>1784</b>
<b>Peripheral arterial systolic-diastolic velocities in athletes and non-athletes by Doppler ultrasound .....</b>	<b>1788</b>
<b>Pilates for elderly women: An improvement in functional mobility and balance.....</b>	<b>1792</b>
<b>Physical activity and subjective well-being in Health Sciences first-year students.....</b>	<b>1796</b>
<b>Validation of the Intentionality Scale of being physically active in a Portuguese population .....</b>	<b>1800</b>
<b>Motivations for the practice of adventure and nature physical activities on young people .....</b>	<b>1804</b>
<b>The Cooperative Games with children: Communitarianism and citizenship .....</b>	<b>1808</b>
<b>Assessment of Portuguese wheelchair basketball team motivation and anxiety levels .....</b>	<b>1812</b>
<b>Assessment of physical capacities of the Portuguese wheelchair basketball team.....</b>	<b>1816</b>
<b>Sociocultural animation in 1st cycle for educational success .....</b>	<b>1820</b>
<b>Is running kinematics of university trained students changed by hipertrophy training? A pilot study .....</b>	<b>1824</b>



This work is licensed under a [Attribution-NonCommercial-NoDerivatives 4.0 International](https://creativecommons.org/licenses/by-nc-nd/4.0/) (CC BY-NC-ND 4.0).

# Physical activity levels in adults with intellectual disabilities: The importance of physical education

ANA JOSÉ AGUIAR RODRIGUES , DUARTE SOUSA, HELDER LOPES, JOÃO PRUDENTE

*Departamento de Educação Física e Desporto, Faculdade de Ciências Sociais, Universidade da Madeira, Portugal*

## ABSTRACT

The relationship between physical activity levels and health indicators is widely reported in the literature. However, the number of studies that characterize the physical activity profile in intellectually disabled adults is still small. The aims of this study are: (i) to determine the levels of physical activity in adults with intellectual disability, (ii) to study differences in physical activity levels between gender and between days with or without physical education. A total of 78 subjects (41 males and 37 females) with intellectual disability (mild and moderate), with a mean age of  $30.18 \pm 8.55$  years, participated in the study. The physical activity levels were evaluated by pedometer (Yamax Digiwalkers SW-700), placed in two working days (one with Physical Education and another without Physical Education classes). There were reduced levels of physical activity in days with Physical Education ( $4865.21 \pm 1611.04$ ) and without ( $3739.22 \pm 1243.34$ ), clearly below the recommended values. Men were more active compared to women, but only on days with Physical Education ( $p < .05$ ). In the days with Physical Education classes, there is a 24% increase in physical activity levels (27% in men and 20% in women). The performance of physical education classes seems to have benefic effects on physical activity levels, however, it is necessary to develop a study that helps to understand more deeply the factors that influence the levels of physical activity in this population. **Keywords:** Intellectual disability; Physical activity; Physical education; Adults.

---

 **Corresponding author.** *Campus da Penteada, 9020-105 Funchal, Portugal.*

E-mail: [anajar@staff.uma.pt](mailto:anajar@staff.uma.pt)

Supplementary Issue: Spring Conferences of Sports Science. International Seminar of Physical Education, Leisure and Health, 17-19 June 2019. Castelo Branco, Portugal.

JOURNAL OF HUMAN SPORT & EXERCISE ISSN 1988-5202

© Faculty of Education. University of Alicante.

doi:10.14198/jhse.2019.14.Proc4.82

## INTRODUCTION

The relationship between physical activity (PA) and health is widely reported in the scientific community (Bouchard, Blair, & Haskell, 2018). Among adults with intellectual disabilities (ID), this relationship is also reported, with indicators as obesity, lipid profile (Gawlik, Zwierzchowska, & Celebanska, 2018) and physical fitness (Jo, Rossow-Kimball, & Lee, 2018). However, studies on people with intellectual disabilities are still limited (Dairo, Collett, Dawes, & Oskrochi, 2016). Thus, the aims of this study are: (i) characterize the profile of PA in adults with ID; (ii) To study the differences in the PA profile between men and females, and between days with and without Physical Education (PE) classes.

## MATERIAL AND METHODS

### **Participants**

A total of 78 subjects (41 males and 37 females) with ID (mild and moderate), aged between 18 and 53 years ( $30.18 \pm 8.55$ ) participated in the study. All participants have PE classes, 120 to 180 minutes/week.

### **Measures**

All participants were assessed in PA through the pedometer (Yamax Digiwalkers SW-700). Participants were asked to use it for 2 working days, one with PE classes and another without.

### **Procedures**

Participants were invited to participate, through informed consent signed by the tutor, as well as by the organizations attended by the participants. The pedometers were placed for 2 working days contemplating a day with and two without PE classes.

### **Analysis**

The mean and standard deviation were used to describe the sample at the levels of PA. The Kolmogorov-Smirnov test to analyse the normality of distributions in quantitative variables. The gender difference in PA levels was determined using the Student T test. Pearson's correlations were used to determine the association between age and PA levels. The Student T-test for paired samples was used to determine differences in PA levels in the same subject between days with and without PE. The statistical software used was SPSS version 25.0 and the level of significance was 5%.

## RESULTS

Reduced levels of PA were observed on working days ( $3739.22 \pm 1243.34$  and  $4865.21 \pm 1611.04$ ). The boys are more active than girls, but only with statistical significance on days with PE classes ( $t(76)=2.674$ ,  $p=.009$ ). There was no association between age and levels of PA ( $p>.05$ ). There is a 24% increase in PA levels on weekdays with PE classes, compared to days without PE classes. Statistically significant differences were observed when the same subject was analysed on two days (male  $t(40)=5.957$ ,  $p<.001$ ; female  $t(36)=4.664$ ,  $p<.001$ ). The difference between the two days is of greater magnitude in the men's comparatively the woman's (increase of 27% Vs 20% in the levels of PA, in the days with PE), without statistical significance.

Table 1. Description of daily physical activity levels by gender (mean ± standard deviation)

	Total (n=78)	Men (n=41)	Woman (n=37)	t	p
Physical activity day with Physical Education (steps. Day)	4865.21±1611.04	5302.71±1818.8	4380.41±1189.99	2.674	.009
Physical activity day without Physical Education (steps. Day)	3739.22±1243.34	3912.12±1494.76	3547.62±972.03	1.324	.190
Difference between days with and without Physical education (steps. Day)	1125.99±1338.19	1390.58±1494.76	832.78±1086.07	1.868	.066

## DISCUSSION

Similar to other studies, there were low levels of PA among participants with ID (Dairo et al., 2016; Hsieh, Hilgenkamp, Murthy, Heller and Rimmer, 2017), values well below those recommended. The supply of PA organized as PE classes represents an increase in PA levels. Even on days with PE classes, participants have PA levels clearly below those recommended. The small differences between days with and without PE deserve, in our view, the same emphasis, and the PE should be the object of future studies. In the same way, we are aware of the limitations of our instrument, particularly in relation to its ability to deal with our analysis. However, there is inconsistent evidence of the effects of interventions to improve levels of physical activity in individuals with ID (Hassan, Landorf, Shields, & Munteanu, 2019). This aspect seems to indicate that behaviour is complex and sustained by multiple personal factors and involvement (Bossink, van der Putten, & Vlaskamp, 2017). Thus, it is essential to develop studies that deepen the conception, dynamization and evaluation of intervention programs (Bossink et al., 2017; Brooker, van Dooren, McPherson, Lennox, & Ware, 2015). Due to the reduced values of PA and the lower effect of the classes of PE in the levels of PA, women should be a priority group of study and intervention.

## CONCLUSIONS

There is a reduced level of physical activity among adults with intellectual impairment. Physical Education classes contribute to increases in physical activity levels. However, it is crucial to deepen the knowledge about the physical activity profile of this population and to promote the conception, dynamization and evaluation of a physical activity promotion program.

## REFERENCES

- Bossink, L. W. M., van der Putten, A. A., & Vlaskamp, C. (2017). Understanding low levels of physical activity in people with intellectual disabilities: A systematic review to identify barriers and facilitators. *Research in Developmental Disabilities*, 68, 95–110. <https://doi.org/10.1016/j.ridd.2017.06.008>
- Bouchard, C., Blair, S. N., & Haskell, W. (2018). *Physical Activity and Health* (2th Eds). Champaign: Human Kinetics.
- Brooker, K., van Dooren, K., McPherson, L., Lennox, N., & Ware, R. (2015). A systematic review of interventions aiming to improve involvement in physical activity among adults with intellectual disability. *Journal of Physical Activity & Health*, 12(3), 434–444. <https://doi.org/10.1123/jpah.2013-0014>

- Dairo, Y. M., Collett, J., Dawes, H., & Oskrochi, G. R. (2016). Physical activity levels in adults with intellectual disabilities: A systematic review. *Preventive Medicine Reports*, 4, 209–219. <https://doi.org/10.1016/j.pmedr.2016.06.008>
- Gawlik, K., Zwierzchowska, A., & Celebanska, D. (2018). Impact of physical activity on obesity and lipid profile of adults with intellectual disability. *Journal of Applied Research in Intellectual Disabilities : JARID*, 31(2), 308–311. <https://doi.org/10.1111/jar.12406>
- Hassan, N. M., Landorf, K. B., Shields, N., & Munteanu, S. E. (2019). Effectiveness of interventions to increase physical activity in individuals with intellectual disabilities: a systematic review of randomised controlled trials. *Journal of Intellectual Disability Research : JIDR*, 63(2), 168–191. <https://doi.org/10.1111/jir.12562>
- Hsieh, K., Hilgenkamp, T. I. M., Murthy, S., Heller, T., & Rimmer, J. H. (2017). Low Levels of Physical Activity and Sedentary Behavior in Adults with Intellectual Disabilities. *International Journal of Environmental Research and Public Health*, 14(12). <https://doi.org/10.3390/ijerph14121503>
- Jo, G., Rossow-Kimball, B., & Lee, Y. (2018). Effects of 12-week combined exercise program on self-efficacy, physical activity level, and health related physical fitness of adults with intellectual disability. *Journal of Exercise Rehabilitation*, 14(2), 175–182. <https://doi.org/10.12965/jer.1835194.597>



This work is licensed under a [Attribution-NonCommercial-NoDerivatives 4.0 International](https://creativecommons.org/licenses/by-nc-nd/4.0/) (CC BY-NC-ND 4.0).