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Systematic Review

Effects of Multicomponent Physical Exercise Programs on Physical Fitness in People with Intellectual Disabilities: A Systematic Review

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Abstract: People with intellectual disabilities (ID) have high rates of overweight and obesity, heart and metabolic diseases, and low motor development. These factors compromise functional independence and autonomy in activities of daily living. The objective of this study was to clarify the design and implementation of multicomponent physical exercise programs (MPEPs) and evaluate their effects on physical fitness in people with ID. A search for scientific articles in English published before 2022 was conducted using Web of Science, PubMed, Scopus, and Science Direct databases. Scientific papers describing the effects of MPEPs on physical fitness in people with ID were considered. A total of 374 articles involving people with ID were included. Positive physical fitness outcomes were found in interventions with MPEPs in its morphological components and to a lesser extent in the motor, muscular, metabolic, and cardiorespiratory aspects in people with ID. Further research is needed to standardize and elucidate the effects of the MPEP on other functional dimensions of physical fitness to use them as a physical activity alternative to reduce sedentary behavior in people with ID.

Keywords: multicomponent exercise; exercise training; intellectual disability; physical fitness; functional capacity

1. Introduction

The number of people with disabilities worldwide is close to one billion, which amounts to 15% of the total population [1]. Of this percentage, between 1.5% to 2.5% corresponds to people with intellectual disabilities (ID) [2], who present high rates of overweight and obesity [3], cardiac and metabolic disease [4], low motor development [5], and reduced muscular endurance, being twice as likely to develop chronic disease and living half as long as people without disabilities [6]. In addition, this population is characterized by a higher risk of falls and lower cardiorespiratory [7] and neuromuscular [8] development, limitations in mobility, and balance and gait problems [9], correlating to higher risk of falls [4], factors that compromise functional independence, and autonomy in activities of daily living [10]. Overall, physical condition related to health of people with ID is

diminished in comparison with the general population, which according to the Toronto model considers five aspects of health-related fitness: morphological, muscular, motor skills, cardiorespiratory, and metabolic [11,12]. In fact, motor skills of males with ID are below the competence expected for children and adolescents without disabilities [13] and the performance in handgrip strength is lower than general population of older adults between 60 and 91 years of age [14].

In general, people with ID demonstrate low levels of physical activity and a high prevalence of sedentary time, completing only 10.7% of the global physical activity recommendations for this population [15]. Also, adults with ID participate in sport and physical activity at lower rates than general population, associated with physical mobility impairment [16]. In this context, different therapeutic and methodological proposals have sought to counteract the aforementioned conditions. Previous studies have shown positive effects of different types of exercise training in people with ID. Interventions that combined aerobic training with resistance, balance, and/or flexibility exercises showed statistically significant cardiorespiratory fitness gains [17], while the application of a specific exercise training program improved strength and balance in children with Down's syndrome [18]. Exercise training has also demonstrated favorable effects on agility, power, and speed, but not balance [19], and combined exercise training has contributed to significant positive effects on aerobic capacity, muscle strength, total cholesterol levels, and resting systolic blood pressure [20].

In this regard, multicomponent physical exercise programs (MPEPs) have emerged, consisting of physical exercises for the maintenance and development of muscular strength, cardiorespiratory endurance, balance, flexibility, and cognition, and which programs are structured in different sequences of movements and levels of complexity [21]. These programs are defined as a structured and safe proposal for integral physical conditioning, which have been applied and have shown favorable results in the physical condition and functional capacity of frail and self-sufficient elderly people [21]. Multicomponent programs have also had favorable effects on the health of older adults with cognitive impairment [22] in nursing homes [23] with degenerative pathologies such as dementia [24] and Alzheimer's disease [25]. In addition, they have been applied to people with ID, showing favorable results in balance and fall-risk reduction [26], as well as in the control of overweight and obesity in adults [27]. MPEPs have been shown to be an effective therapeutic tool for the improvement of functional capacity and its transfer to activities of daily living [28]. However, the protocols used in the design and implementation of these programs and the effects on the physical fitness components of people with ID are not entirely clear [11] as interventions are usually poorly described in terms of exercise components and measurement protocols. Therefore, the aim of the present systematic review was to clarify the design and implementation of MPEPs and evaluate their effects on physical fitness in people with ID.

2. Materials and Methods

This systematic review used the guidelines proposed by the preferred reporting items for systematic reviews and meta-analyses (PRISMA) [29]. In November 2022, the lead author systematically reviewed four electronic databases (Web of Science, PubMed, Scopus, and ScienceDirect) on the application of MPEPs and their effects on physical fitness components of people with ID. Similar to what is proposed by the Toronto model, composed of five components: morphological, muscular, cardiorespiratory, metabolic, and motor [11], other scientific studies published in peer-reviewed journals until 28 October 2022, were considered eligible. The search terms used for this review were constructed using the PICO strategy [30]: (a) the population was made of people with ID; (b) physical activity interventions that declare the use of MPEP; (c) any type of comparison before and post-intervention, both intra- and intergroups; (d) results in physical fitness and its components; (e) experimental and quasi-experimental studies; (f) original articles written in English. The keywords used for the search were: "Multicomponent exercise program", "Multicomponent

training", "Multicomponent exercise", "Intellectual disability", "Intellectual disabilities" and "Mental retardation", using the Boolean operator "AND" and the search combinations presented in Table 1. Original scientific publications written in English were considered, obtaining a total of 374 articles, of which 168 articles were eliminated because they were duplicates. It is important to mention that in the search for information, specific areas of research were not considered in order to have a broader scope of information.

Table 1. Search combinations in databases.

Keyword (Topic 1)	BO	Keyword (Topic 2)	Pubmed	Scopus	WoS	Science Direct
Multicomponent exercise program	"AND"	Intellectual disabilit *	13	5	7	41
Multicomponent exercise program	"AND"	Mental retardation	10	0	2	10
Multicomponent training	"AND"	Intellectual disabilit *	34	10	11	77
Multicomponent training	"AND"	Mental retardation	30	0	0	17
Multicomponent exercise	"AND"	Intellectual disabilit *	21	8	6	43
Multicomponent exercise	"AND"	Mental retardation	18	0	0	11
	Total articles		126	23	26	199

BO: Boolean operator; intellectual disabilit *: disability and disabilities.

In the selection of the study sample, the following inclusion criteria were considered: (a) original scientific studies considering all design types; (b) articles that considered MPEP and its relationship with the different components of physical condition related to health in people with ID as main variables; (c) studies that presented measurable outcomes related to all components of physical fitness; (d) all types of exercise intervention; (e) studies that stated the training protocol used. The exclusion criteria were based on: (a) results not related specifically to participants with ID; (b) MPEPs not included as a main way of physical activity. For the application of the aforementioned criteria, the reading of the title and abstract was considered to apply the first inclusion criterion. To apply the second and third criteria, we read the article, analyzing the methodology and main results obtained in the physical condition and health variables. After applying these criteria, 195 articles were eliminated, leaving 11 articles read in full, of which 6 were finally selected for the present review. To organize the data obtained from the selected studies in a structured manner, a previously designed template was used to synthesize the content in relation to the previously defined variables: (1) authors and references of the article, (2) methodological design and sample of participants, (3) intervention protocol and study variables, (4) characteristics of the program applied, and (5) most relevant conclusions of each study.

Population and Sample of Scientific Studies

Based on the procedure described and the search strategy employed, the total number of studies corresponded to 374 articles extracted from Web of Science and Scopus databases, and PubMed and ScienceDirect search engines. After coding, duplicates were eliminated and the inclusion criteria described above were applied, obtaining a total of 6 scientific articles, as shown in the flow chart in Figure 1.

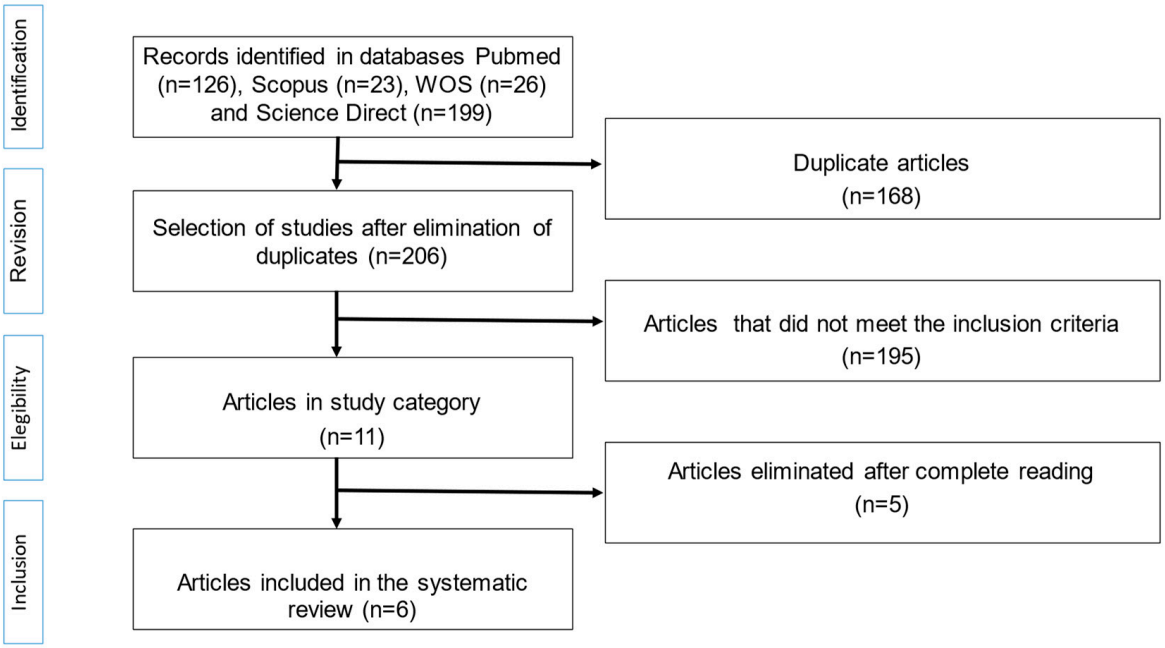

Figure 1. Flow chart of the search performed considering the PRISMA statement [29].

3. Results

A total of 11 articles were related to MPEPs in people with ID. However, this systematic review considered 6 of the 11 studies due to the relevance and type of research, corresponding to 54.5 % of the scientific production in this subject applied to this population.

The descriptive results of each selected study (n = 6) [31–36] are presented below in the Table 2. The following coding was used to extract the data: (1) author(s) and year of publication, (2) participants, (3) age, (4) study design, (5) physical activity protocol, (6) frequency, (7) session duration, (8) program duration, (9) intensity, (10) variables, (11) outcomes, and (12) complementary interventions.

Table 2. Characteristics of multicomponent physical exercise programs and protocols applied in people with ID.

References	Participants	Age	Study Design	Training Protocol	Frequency	Session Duration	Program Duration	Intensity	Variables	Results	Complementary Intervention
Harris et al. [31]	(n = 156) Adults with and without ID and obesity [BMI ≥ 30 kg/m^2]	≥18 years	Randomized, single-blind, pilot, single-center trial.	≥30 min of cumulative PA, including activities at home, walking, sports, and exercise.	2–3 times per week	40–60 min	48 weeks	Moderate	Body weight, BMI, waist circumference and body fat percentage.	↓ Body weight from 5 to 10%.	Diet, behavior change strategies.
Kim et al. [32]	(n = 43) Adolescents with ID	≥13 years	Pretest-post-test trial of two groups, EG and CG by blinded analysis.	Combined exercise program: stretching, running, or walking, aerobic exercise, strength training and recreation.	Once a week	60 min	10 weeks	Not specified	Anthropometry, body composition, blood pressure, blood tests, pulmonary function, physical function and quality of life.	EG: ↑ BMI, ↑ fat-free mass, ↓ % fat, ↑ handgrip strength; CG: ↑ SBP, ↓ HDL and ↓ total cholesterol, ↑ repetitions in sit-to-stand test	Nutrition education, behavior modification.

Table 2. *Cont.*

References	Participants	Age	Study Design	Training Protocol	Frequency	Session Duration	Program Duration	Intensity	Variables	Results	Complementary Intervention
Kovačič, et al. [26]	(n = 180) Athletes with ID and a history of falls.	≥18 years	Randomized controlled trial	Specific exercise program for balance, including walking/running on a treadmill, dynamic strength and stretching exercises.	1–2 times per week	60 min	16 weeks	Not specified	Static/dynamic balance and frequency of fall notification.	↑ Balance skills	Counseling on principles of behavior change and healthy aging.
Martínez-Zaragoza et al. [27]	(n = 66) Adults with low and moderate ID.	23–50 years	Quasi-experimental with repeated measures and non-equivalent control group.	Sub-aerobic or aerobic activity, strength and power training, including activities based on autonomy.	5 times per week	60 min	17 weeks	Not specified	Body weight, HR, SBP, and DBP.	↓ Body weight, ↑ HR, SBP, and DBP reached after the intervention	Dietary and caloric restriction, motivational strategies.
Melville et al. [33]	(n = 47) Adults with and without ID and obesity [BMI ≥ 30 kg/m^2]	≥18 years	Open study	≥30 min of cumulative PA, including activities at home, walking, sports, and exercise.	2–3 times per week	40–60 min	24 weeks	Moderate	Body weight, BMI, waist circumference, PA levels, sedentary behavior.	↓ Body weight, BMI, waist circumference and sedentary levels	Personalized dietary prescription.
Obrusnikova et al. [34]	(n = 24) Adults with ID	18–44 years	Pilot randomized clinical trial	Multicomponent resistance training intervention.	Not specified	Not specified	13 weeks	%1RM and OMNIRES Scale	Muscular strength and independent functional performance (6-min walk test, number of steps, stair climbing).	↑ Muscle strength and functional performance.	No complementary intervention.

↑: Increase; ↓: Decreases; BMI: body mass index; PA: physical activity; HR: heart rate; SBP: systolic blood pressure; DBP: diastolic blood pressure; EG: experimental group; CG: control group; MR: maximum repetition.

All the selected protocols considered participants with ID in their sample, where all articles focused on the adult population (aged 18 years and older), except one that considered adolescents (≥13 years) [32]. Inclusion criteria were based on population with ID and obesity [31,33]. In terms of study design, some correspond to randomized controlled trials [26,31,34], one open study [33], one quasi-experimental study with a non-equivalent control group [27], and one pre- and post-test trial [32].

In most of the studies, the duration of the intervention was established between 16 and 48 weeks, with a frequency of between one and five days a week. The average duration of each session was between 40 and 60 min, and the intensity was stated in only three of the studies analyzed.

In all the interventions, it is observed that the protocols included different types of exercise, mainly sub-aerobic or aerobic resistance exercises (walking, running, sports) and static and dynamic muscular strength exercises. Some protocols included other interventions such as muscle stretching exercises [34] or recreational exercises [31–33]. One study placed special emphasis on static and dynamic balance exercises as a consideration of coordinative components [26]. Most studies considered the components of physical fitness, based on the morphological component, specifically on anthropometric measures such as weight, height, BMI, waist circumference, and/or body fat percentage. The cardiorespiratory component was considered in two studies [27,32], with interventions aimed at improving blood pressure, blood markers, and lung function. Only one of the studies looked at health-related quality of life [32], and another looked at sedentary behavior [33].

Some studies considered the motor and muscular component as qualities to be improved in the interventions, whose training protocols considered maximal strength training, functional capacity, static/dynamic balance, and risk of falling [26,34].

Regarding the results obtained, in most studies considered, favorable modifications were observed in some morphological and metabolic components' variables [27,31–33]. Other studies showed positive results in the motor component, with improvements in muscle strength, static/dynamic balance, and functional capacity as the resulting qualities [26,34]. Almost all of the selected studies included complementary interventions to the multicomponent physical exercise program, which consisted of theoretical counseling on topics relevant to the intervention, such as behavioral changes, active aging, motivational strategies, and family support, except for one intervention [34]. Most studies included a complementary nutritional approach as part of the intervention program [27,31–33].

4. Discussion

The present study aimed to evaluate the effects of MPEPs in people with ID. Positive results were found in the application of the MPEP in the physical condition of people with ID, especially in the morphological components, as well as in the motor, muscular and cardiorespiratory components, functional capacity, and balance in the participants.

In this context, people with ID have a higher prevalence of overweight and obesity [35], motor impairments, functional limitations, and decreased physical fitness involving reduced aerobic capacity and muscle strength [36]. Thus, the MPEPs considered in this review emerge as an innovative intervention proposal to improve the common alterations of people with ID. However, although all studies show favorable results in this population's physical condition and health, there is no consensus on the implementation of MPEP protocols, differing in terms of frequency, duration, intensity, physical components, and types of exercise.

There is evidence in favor of structured physical exercise programs in special populations, which has demonstrated changes in body composition in people with ID [37], as well as those who are inclined to present these programs playfully seeking to report benefits in cardiometabolic health and adherence to them [38]. In addition, combined exercise programs have shown positive effects on total cholesterol levels, blood pressure, aerobic capacity, and muscle strength [20]. In the same line of work, a 10-month intervention based on structured motor games of strength and endurance showed positive results in adiposity and lean mass levels in a sample of male Down's syndrome patients [39]. The studies selected for the present review have been applied in adults with ID, in which sense Bull et al. [40] indicate that adults living with disabilities should perform 150–300 min/wk of moderate-intensity aerobic activity, or 75–150 min/wk of vigorous, functionally oriented, multicomponent strength and balance exercises. However, in spite of the guidelines, the practical and methodological orientations are not clear in the arrangement of the components suggested for the structure of training sessions and programs for the physical condition and health improvement of people with ID. In fact, it is noted that some authors [41] have based their studies on previous interventions that have yielded favorable results and have replicated those models without proposing a standard structure for MPEPs. In this sense, it can be seen that the physical components to be promoted through the physical exercise protocols analyzed are very different. There is no consensus on the main physical capacities to which these physical exercise programs should be oriented. Thus, considering that the level of physical fitness of the population with ID is lower compared to those without disability and decreases over the years, it causes them to have a higher risk of health deterioration associated with aging and low physical fitness [42]. Therefore, it is essential to expand research on the subject to establish structured a MPEP that can facilitate its implementation in people with ID to achieve the expected objectives at the physical and functional level.

On the other hand, the protocols analyzed for the present review mainly focus on the participants' body composition, privileging results in objectively measured anthropometric variables, particularly weight, BMI, and waist circumference. In fact, four of the six studies considered do not target their interventions towards physical–functional components, aspects that should become more relevant for the transfer to working life in people with

ID [43]. This is why the learning acquired in school education should be transferred to the labor field, considering the high prevalence of obesity, overweight, and sedentary behaviors of people with ID [44]. However, in spite of the potential benefits of the MPEP, their use, research, and understanding by physical educators and related professionals, as well as their incorporation in the preparation of adolescents and adults for working life from the school stage, have not yet become widespread.

Among the strengths of the interventions, it is inferred that the multicomponent factor could increase the adherence of the participants to the exercise program due to the continuous creativity and flexibility in the development and modification of the programs to meet the changing needs of participants, which will help to maintain the performance of physical exercise over time [45,46], consequently improving the quality of life of people with ID in the long term. Despite the above, only one study [27] stated a frequency of 3–5 weekly sessions, a key element for the generation of habits and adherence to physical exercise programs [47]. In addition, all of the selected studies incorporated complementary interventions to physical exercise such as education, counseling, and behavior modification strategies, in addition to motivation techniques and family support, emphasizing the great importance of social and family support in the adoption and maintenance of physical activity patterns, as opposed to the literature reviewed, which is mostly based on purely physical exercise interventions.

Among the limitations of the selected studies, it was determined that all of them were carried out in adolescents and adults, not considering the child population nor an analysis by sex in the responses to these interventions. In terms of intervention protocols, the least-considered element in the structuring of the MPEP was the intensity of the intervention, which in many of the studies is not stated or specified. In addition, the heterogeneity in time in the average duration of the MPEP was 21 weeks, with a range between 10 and 48 weeks, which does not allow for establishing concrete conclusions to the effects of MPEPs in shorter periods on the different physical fitness components. This opens the door to future lines of research, where studies not only consider morphological aspects but also focus on motor, metabolic and functional components through different methodologies applied to people with ID in their life course. Among the limitations of the present review, we can list the lack of consideration of other aspects that could have affected the obtained results, such as nutrition and diet, lifestyle, and program adherence. Also, we did not conduct a meta-analysis to assess the results, nor did we consider the quality of the evidence and the strength of the recommendations [48] to derive conclusions on the selected studies, which can be improved in future review articles.

5. Conclusions

This systematic review contains data to support that interventions with MPEPs could have positive outcomes in physical fitness of people with ID, demonstrating improvements in body composition, muscle strength, balance, and functional capacity. However, MPEP are not standardized in terms of protocols and components of the physical condition in which they are applied and mostly focus on improving morphological components related to changes in body composition and to a lesser extent to the motor, muscular, metabolic, and cardiorespiratory aspects. Further research is needed to fully conclude knowledge of their effects and standardize their structure to consider them as an alternative for compliance with physical activity recommendations, adherence, and reduction of sedentary behavior in people with ID.

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References

1. World Health Organization. World Report on Disability. 2011. Available online: https://www.who.int/teams/noncommunicable-diseases/sensory-functions-disability-and-rehabilitation/world-report-on-disability (accessed on 8 October 2022).
2. Maulik, P.K.; Mascarenhas, M.N.; Mathers, C.D.; Dua, T.; Saxena, S. Prevalence of intellectual disability: A meta-analysis of population-based studies. *Res. Dev. Disabil.* **2013**, *34*, 729. [CrossRef]
3. Krause, S.; Ware, R.; McPherson, L.; Lennox, N.; O'Callaghan, M. Obesity in adolescents with intellectual disability: Prevalence and associated characteristics. *Obes. Res. Clin. Pract.* **2016**, *10*, 520–530. [CrossRef] [PubMed]
4. Morin, D.; Mérineau-Côté, J.; Ouellette-Kuntz, H.; Tassé, M.J.; Kerr, M. A comparison of the prevalence of chronic disease among people with and without intellectual disability. *Am. J. Intellect. Dev. Disabil.* **2012**, *117*, 455–463. [CrossRef] [PubMed]
5. Alesi, M.; Battaglia, G.; Pepi, A.; Bianco, A.; Palma, A. Gross motor proficiency and intellectual functioning: A comparison among children with Down syndrome, children with borderline intellectual functioning, and typically developing children. *Medicine* **2018**, *97*, e12737. [CrossRef] [PubMed]
6. Barwick, R.B.; Tillman, M.D.; Stopka, C.B.; Dipnarine, K.; Delisle, A.; Huq, M.S. Physical capacity and functional abilities improve in young adults with intellectual disabilities after functional training. *J. Strength Cond. Res.* **2012**, *26*, 1638–1643. [CrossRef] [PubMed]
7. Boonman, A.J.N.; Schroeder, E.C.; Hopman, M.T.E.; Fernhall, B.O.; Hilgenkamp, T.I.M. Cardiopulmonary Profile of Individuals with Intellectual Disability. *Med. Sci. Sports Exerc.* **2019**, *51*, 1802–1808. [CrossRef]
8. Zghal, F.; Borji, R.; Colson, S.S.; Sahli, S.; Rebai, H. Neuromuscular characteristics in trained vs. sedentary male adults with intellectual disability. *J. Intellect. Disabil. Res.* **2019**, *63*, 1334–1345. [CrossRef]
9. Enkelaar, L.; Smulders, E.; van Schrojenstein Lantman-de Valk, H.; Geurts, A.C.H.; Weerdesteyn, V. A review of balance and gait capacities in relation to falls in persons with intellectual disability. *Res. Dev. Disabil.* **2012**, *33*, 291–306. [CrossRef]
10. Devi, N. Supported decision-making and personal autonomy for persons with intellectual disabilities: Article 12 of the UN convention on the rights of persons with disabilities. *J. Law. Med. Ethics* **2013**, *41*, 4. [CrossRef]
11. Bouchard, C.; Shephard, R.J.; Stephens, T. Physical activity, fitness, and health: International proceedings and consensus statement. In *International Consensus Symposium on Physical Activity, Fitness, and Health*; Human Kinetics Publishers: Toronto, ON, Canada, 1994.
12. Liguori, G. *ACSM's Health-Related Physical Fitness Assessment Manual*, 5th ed.; Wolters Kluwer: Philadelphia, PA, USA, 2018.
13. Pitetti, K.; Miller, R.A.; Loovis, M. Balance and coordination capacities of male children and adolescents with intellectual disability. *Adapt. Phys. Act. Q.* **2017**, *34*, 1–18. [CrossRef]
14. Mancilla, E.; Ramos, S.; Morales, P. Fuerza de prensión manual según edad, género y condición funcional en adultos mayores Chilenos entre 60 y 91 años. *Rev. Méd. Chile* **2016**, *144*, 598–603. [CrossRef] [PubMed]
15. Oviedo, G.R.; Travier, N.; Guerra-Balic, M. Sedentary and physical activity patterns in adults with intellectual disability. *Int. J. Environ. Res. Public Health* **2017**, *14*, 1027. [CrossRef] [PubMed]
16. Borland, R.; Hu, N.; Tonge, B.; Einfeld, S.; Gray, K. Participation in sport and physical activity in adults with intellectual disabilities. *J. Intellect. Disabil. Res.* **2020**, *64*, 908–922. [CrossRef] [PubMed]
17. Obrusnikova, I.; Firkin, C.J.; Farquhar, W.B. A systematic review and meta-analysis of the effects of aerobic exercise interventions on cardiorespiratory fitness in adults with intellectual disability. *Disabil. Health J.* **2022**, *15*, 101185. [CrossRef] [PubMed]
18. Gupta, S.; Rao, B.K.; Kumaran, S. Effect of strength and balance training in children with Down's syndrome: A randomized controlled trial. *Clin. Rehabil.* **2011**, *25*, 425–432. [CrossRef] [PubMed]
19. Jeng, S.-C.; Chang, C.-W.; Liu, W.-Y.; Hou, Y.-J.; Lin, Y.-H. Exercise training on skill-related physical fitness in adolescents with intellectual disability: A systematic review and meta-analysis. *Disabil. Health J.* **2017**, *10*, 198–206. [CrossRef]
20. Calders, P.; Elmahgoub, S.; de Mettelinge, T.R.; Vandenbroeck, C.; Dewandele, I.; Rombaut, L.; Vandevelde, A.; Cambier, D. Effect of combined exercise training on physical and metabolic fitness in adults with intellectual disability: A controlled trial. *Clin. Rehabil.* **2011**, *25*, 1097–1108. [CrossRef]
21. Izquierdo, M. Prescripción de ejercicio físico. El programa Vivifrail como modelo [Multicomponent physical exercise program: Vivifrail]. *Nutr. Hosp.* **2019**, *36*, 50–56. [CrossRef]
22. Casas-Herrero, A.; Anton-Rodrigo, I.; Zambom-Ferraresi, F.; Saez De Asteasu, M.L.; Martinez-Velilla, N.; Elexpuru-Estomba, J.; Marin-Epelde, I.; Ramon-Espinoza, F.; Petidier-Torregrosa, R.; Sanchez-Sanchez, J.L.; et al. Effect of a multicomponent exercise programme (VIVIFRAIL) on functional capacity in frail community elders with cognitive decline: Study protocol for a randomized multicentre control trial. *Trials* **2019**, *20*, 362. [CrossRef]
23. Romero-García, M.; López-Rodríguez, G.; Henao-Morán, S.; González-Unzaga, M.; Galván, M. Effect of a Multicomponent Exercise Program (VIVIFRAIL) on Functional Capacity in Elderly Ambulatory: A Non-Randomized Clinical Trial in Mexican Women with Dynapenia. *J. Nutr. Health Aging* **2021**, *25*, 148–154. [CrossRef]

24. Borges-Machado, F.; Silva, N.; Farinatti, P.; Poton, R.; Ribeiro, Ó.; Carvalho, J. Effectiveness of Multicomponent Exercise Interventions in Older Adults with Dementia: A Meta-Analysis. *Gerontologist* **2021**, *61*, e449–e462. [CrossRef] [PubMed]
25. Sampaio, A.; Marques, E.A.; Mota, J.; Carvalho, J. Effects of a multicomponent exercise program in institutionalized elders with Alzheimer's disease. *Dementia* **2019**, *18*, 417–431. [CrossRef] [PubMed]
26. Kovačič, T.; Kovačič, M.; Ovsenik, R.; Zurc, J. The impact of multicomponent programmes on balance and fall reduction in adults with intellectual disabilities: A randomised trial. *J. Intellect. Disabil. Res.* **2020**, *64*, 381–394. [CrossRef]
27. Martínez-Zaragoza, F.; Campillo-Martínez, J.M.; Ato-García, M. Effects on physical health of a multicomponent programme for overweight and obesity for adults with intellectual disabilities. *J. Appl. Res. Intellect. Disabil.* **2016**, *29*, 250–265. [CrossRef] [PubMed]
28. Bruderer-Hofstetter, M.; Rausch-Osthoff, A.K.; Meichtry, A.; Münzer, T.; Niedermann, K. Effective multicomponent interventions in comparison to active control and no interventions on physical capacity, cognitive function and instrumental activities of daily living in elderly people with and without mild impaired cognition—A systematic review and network meta-analysis. *Ageing Res. Rev.* **2018**, *45*, 1–14. [CrossRef]
29. Parums, D.V. Editorial: Review Articles, Systematic Reviews, Meta-Analysis, and the Updated Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 Guidelines. *Med. Sci. Monit.* **2021**, *27*, e934475. [CrossRef]
30. Eriksen, M.B.; Frandsen, T.F. The impact of patient, intervention, comparison, outcome (PICO) as a search strategy tool on literature search quality: A systematic review. *J. Med. Libr. Assoc.* **2018**, *106*, 420–431. [CrossRef]
31. Harris, L.; Hankey, C.; Jones, N.; Pert, C.; Murray, H.; Tobin, J.; Boyle, S.; Melville, C. A cluster randomised control trial of a multi-component weight management programme for adults with intellectual disabilities and obesity. *Br. J. Nutr.* **2017**, *118*, 229–240. [CrossRef]
32. Kim, Y.S.; Moon, J.H.; Hong, B.K.; Ho, S.H. Effect of a Multicomponent Intervention Program on Community-Dwelling People with Intellectual Disabilities. *Ann. Rehabil. Med.* **2020**, *44*, 327–337. [CrossRef]
33. Melville, C.A.; Boyle, S.; Miller, S.; Macmillan, S.; Penpraze, V.; Pert, C.; Spanos, D.; Matthews, L.; Robinson, N.; Murray, H.; et al. An open study of the effectiveness of a multi-component weight-loss intervention for adults with intellectual disabilities and obesity. *Br. J. Nutr.* **2011**, *105*, 1553–1562. [CrossRef]
34. Obrusnikova, I.; Cavalier, A.R.; Suminski, R.R.; Blair, A.E.; Firkin, C.J.; Steinbrecher, A.M. A Resistance Training Intervention for Adults with Intellectual Disability in the Community: A Pilot Randomized Clinical Trial. *Adapt. Phys. Activ. Q.* **2021**, *38*, 546–568. [CrossRef] [PubMed]
35. Hsieh, K.; Rimmer, J.H.; Heller, T. Obesity and associated factors in adults with intellectual disability. *J. Intellect. Disabil. Res.* **2014**, *58*, 851–863. [CrossRef] [PubMed]
36. Silva, V.; Campos, C.; Sá, A.; Cavadas, M.; Pinto, J.; Simões, P.; Machado, S.; Murillo-Rodríguez, E.; Barbosa-Rocha, N. Wii-based exercise program to improve physical fitness, motor proficiency and functional mobility in adults with Down syndrome. *J. Intellect. Disabil. Res.* **2017**, *61*, 755–765. [CrossRef]
37. Martínez-Espinosa, R.M.; Molina Vila, M.D.; Reig García-Galbis, M. Evidences from Clinical Trials in Down Syndrome: Diet, Exercise and Body Composition. *Int. J. Environ. Res. Public Health* **2020**, *17*, 4294. [CrossRef] [PubMed]
38. Farías-Valenzuela, C.; Cofré-Bolados, C.; Espoz-Lazo, S.; Valdivia-Moral, P. El juego motriz estructurado como estrategia de adherencia y estimulación cardiometabólica en ambientes escolares. In *Innovación Docente e Investigación Educativa en la Sociedad del Conocimiento*; Hinojo-Lucena, F., Trujillo-Torres, J.M., Sola-Reche, J., Alonso-García, S., Eds.; Editorial Dykinson, S.L.: Madrid, Spain, 2020; pp. 281–296.
39. Farías-Valenzuela, C.; Cofré-Bolados, C.; Ferrari, G.; Espoz-Lazo, S.; Arenas-Sánchez, G.; Álvarez-Arangua, S.; Espinoza-Salinas, A.; Valdivia-Moral, P. Effects of Motor-Games-Based Concurrent Training Program on Body Composition Indicators of Chilean Adults with Down Syndrome. *Sustainability* **2021**, *13*, 5737. [CrossRef]
40. Bull, F.C.; Al-Ansari, S.S.; Biddle, S.; Borodulin, K.; Buman, M.P.; Cardon, G.; Carty, C.; Chaput, J.-P.; Chastin, S.; Chou, R.; et al. World Health Organization 2020 guidelines on physical activity and sedentary behaviour. *Br. J. Sports Med.* **2020**, *54*, 1451–1462. [CrossRef] [PubMed]
41. Harris, L.; Hankey, C.; Jones, N.; Murray, H.; Pert, C.; Tobin, J.; Boyle, S.; Shearer, R.; Melville, C.A. Process evaluation of a cluster-randomised controlled trial of multi-component weight management programme in adults with intellectual disabilities and obesity. *J. Intellect. Disabil. Res.* **2019**, *63*, 49–63. [CrossRef]
42. Graham, A.; Reid, G. Physical fitness of adults with an intellectual disability: A 13-year follow-up study. *Res. Q. Exerc. Sport* **2000**, *71*, 152–161. [CrossRef]
43. Bergström, H.; Hagströmer, M.; Hagberg, J.; Elinder, L.S. A multi-component universal intervention to improve diet and physical activity among adults with intellectual disabilities in community residences: A cluster randomised controlled trial. *Res. Dev. Disabil.* **2013**, *34*, 3847–3857. [CrossRef]
44. Froehlich-Grobe, K.; Lollar, D. Obesity and disability: Time to act. *Am. J. Prev. Med.* **2011**, *41*, 541–545. [CrossRef]
45. Salgado-Araujo, M. Revisión de la literatura actual sobre la continuidad del cambio de conducta en relación a la actividad física. *Apunts. Educ. Física Esports* **1998**, *54*, 66–77.
46. Fernández-Revelles, A.B.; Rangel-García, J.A.; Loza-Herbella, J. Effect of 32 weeks of multicomponent physical exercise for the prevention of fragility in people over 65. *J. Sport Health Res.* **2022**, *14* (Suppl. S1), 45–56.

47. Espinosa, R.; Díaz, Z.; Higuera, L.; Nicot, J. Adherencia al ejercicio físico de los pacientes incorporados al Programa de prevención y rehabilitación cardiaca. *Rev. Cuba. Med. Física Rehabil.* **2017**, *7*, 1.
48. Aguayo-Albasini, J.L.; Flores-Pastor, B.; Soria-Aledo, V. Sistema GRADE: Clasificación de la calidad de la evidencia y graduación de la fuerza de la recomendación [GRADE system: Classification of quality of evidence and strength of recommendation]. *Cir. Esp.* **2014**, *92*, 82–88. [CrossRef] [PubMed]