International
Journal of Medical and Exercise Science
(Multidisciplinary, Peer Reviewed and Indexed Journal)

ORIGINAL ARTICLE

THE EDUCATION PROGRAMS ENHANCING PHYSICAL ACTIVITY: SYSTEMATIC LITERATURE REVIEW

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ABSTRACT

Background: Doing regular physical activity has many benefits, but the reality is people do not do it. Education is one of the efforts to promote sufficient physical activity in society. The study aims to provide a systematic review of the impact of educational program enhancing in physical activity. **Methods**: A systematic literature review using preferred reporting items for systematic reviews. A precise search of the journal database was identified and thematic analysis was used to summarize the findings. The study using three databases, conducted from 2012 to 2022, language in English, the research design was an experimental study, and using educational program interventions. We used Boolean with keywords: Physical activities AND education. The articles obtained are downloaded and analysis by the authors. The analysis was conducted by comparing the increase in physical activity after the intervention. **Results:** Nine articles from the database were eligible for review, it was found that education was provided in many models, such: (1) consultation; (2) distributing physical activity videos: (3) environmental modification; (4) assisting physical education; (5) improving healthy eating and active living policies; (6) specific exercise; (7) face to face training and educational booklet; (8) The Pender's HPM (nine 4-h training sessions and consulting support via telephone contact and social media group; and (9) based on socio-ecological model and conducted on 4 levels. Comprehensive education using a socio-ecological model is suitable for improving the changing physical activity (2612,15 MET-min/week). **Conclusions:** Participants who were given a comprehensive education program and behavior change theory produced high changes in physical activity.

Keywords: Education, behavior, exercise, activity, training.

Received on 18th February 2025; Revised on 24th February 2025; Accepted on 28th February 2025
DOI:10.36678/IJMAES.2025.V11I01.016

INTRODUCTION

Physical activity is one of many factors that affect non-communicable diseases. Sufficient physical activity may improve health[1], improve individual mental health, and well-being [2]. In 2020, there were 3.9 million [3] and in 2015 there were 5.3 million deaths related to sedentary lifestyles. Other data shows that between 2001-2016, one in four adults did not do as much physical activity as they should [4], especially during the Covid pandemic, where movement is limited which results in people being affected by joint disease [5]. WHO recommends that all countries set physical activity targets in national guidelines and tools, thereby helping to support all age groups to maintain their health [6].

Physical activity promotion is encouraged worldwide, including in developing countries, Indonesia has made efforts to promote sufficient physical activity among its citizens through education, sports-promoting campaigns, increasing provision of physical activity facilities, encouraging motor vehicle-free areas to facilitate physical activities, Health Community Movementcampaign, and encouraging connectivity between modes of public transportation [7]. It is said that sufficient physical activity is adjusted to age and health condition, as 5-17 years old individuals should exercise three times a week for 60 minutes, and above 18 years old individual should exercise 150-300 minutes of moderate intensity per week, and individuals with poor health condition may suit times and types of exercises according to their physical fitness [8]. Providing appropriate physical activity with self-efficacy has been shown to result in longer adherence [9], another benefit is that it results in physical, psychological, social, spiritual, and total health [10].

Promoting physical activity requires resources and collaboration with all stakeholders, including education for the community [11]. Community education about active lifestyle is a more popular solution, compared with other promotional activities, as it may be done anywhere, anytime, and to anyone with affordable resources. Many educational interventions have been carried out to increase physical activity in the community, but the summary is still needed. This research aims to provide a systematic review of educational programs that result in changes in physical activity.

METHODS

This research is a systematic literature review with Preferred Reporting Items for Systematic Reviews & Met Analyses (PRISMA) 2009 12.

Literature search strategy: Precise criteria and strategies for searching on journal databases were identified and thematic analysis was used to summarise findings. A systematic review was conducted between June and August 2022 using three electronic databases. The criteria include a) from three databases such as PubMed, Web of Science, Scopus, and others published, b) conducted from 2012 to 2022, c) using the English language, d) using experiment study; and e) using education program as intervention. We used Boolean with the keyword: Physical activities AND education. The article found will be downloaded and analysis. Eligibility criteria are stated from the research question through the Problem, Intervention, Comparative, Outcome, and Studies (PICOS) assessment [12].

Data extraction: Data was extracted and verified by the researcher using PICOS forms. The article obtained that matches the criteria will be summarized in a table, which contains: (1) author's name, (2) title, (3) country and year of research, (4) intervention models, (5) sampling method and number of samples, (6) outcomes related to physical activity, and (7) pre and post-intervention results and change results. Critical reviews will be analysed one by one through in-depth discussions between researchers.

Bias Risk Evaluation: To reviewer (CPJ, WB, BN) independently assesses each article using the Robvis tools approach, i.e. randomization bias, intervention bias, lost data, outcome measurement, and result selection 13. From five domains from nine eligible articles were produced 31% with some concern bias and 69% low risk bias%.

RESULTS

The result of three journal databases and other sources was 157 articles that meet the criteria. After reading all of the text, 15% of the articles were excluded due to duplication, 69% were excluded as not meeting the PICOS criteria, and 24 articles were eligible. As not all the articles can open, only 15 articles may be analyzed. By our analysis of full-text articles, we found 6 articles rejected from the research objectives, thus only 9 articles may be analyzed qualitatively (see picture 1).

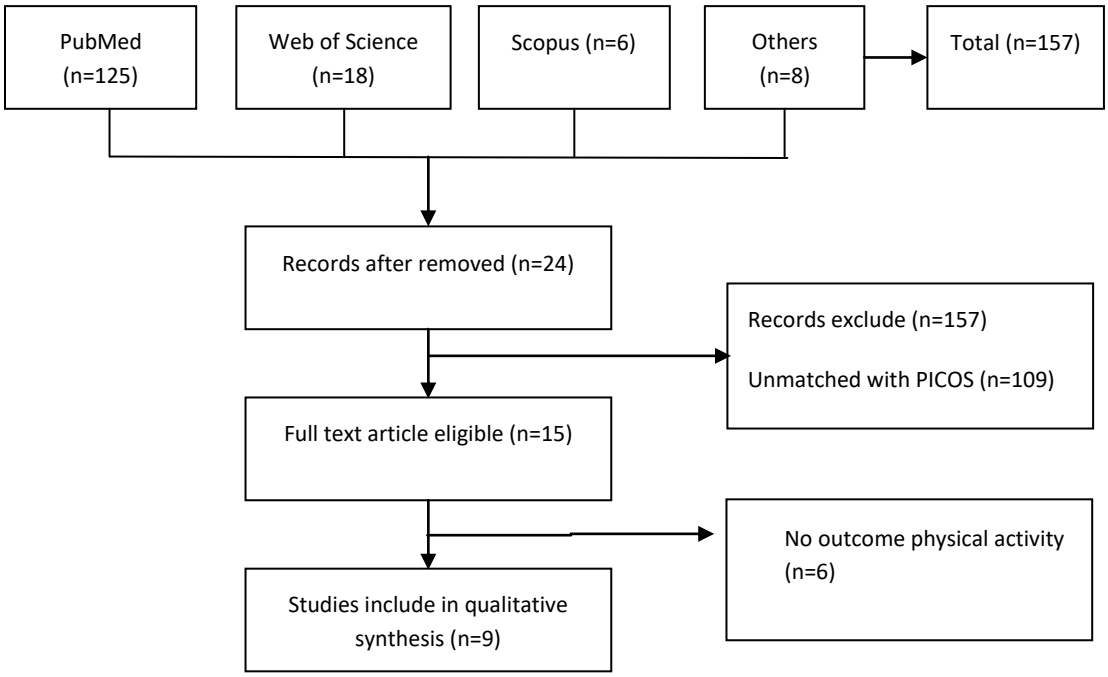

Figure 1. Flowchart Article Selection Process

Participants of the research study consisted of children and adults with varying health conditions, such as health, autism, and low back pain. As the results of eligible articles, it was found that apart from providing knowledge, education was also provided in

other forms, i.e: (1) consultation resulted in a change of 178 MET-min/week, (2) distributing physical activity videos using private WhatsApp groups and videos resulted in a change of 31.19 MET-min/week, (3) environmental modification produces changes of 60,2 MET-min/week; (4) Assisting physical education resulted in a change of 45,1 point; (5) Caregiver to improve healthy eating and active living policies resulted in a change of 1,24 point; (6) Low-Load Motor Control (LMC) and High Load Lifting (HLL) exercise resulted in a mean of change of 4,2 point of LMC and 2,5 point of HLL; (7) Training face to face and educational booklet resulted in a change of 1263.68 MET-min/week; (8) The Pender's HPM (nine 4-h training sessions and consulting support via phone contact and social media group) resulted in a change of 37 MET-min/week, dan; (9) Based on socioecological model and conducted on 4 levels of personal, social, organizational, and political resulted in a change of 2612.15 MET-min/week.

No	Study	Title	Country And Year of Research	Form Of Intervention	Sampling Method and Number of Samples	Outcomes Related to Physical Activity	Pre And Post Intervention Results and Change Results (Δ)
1	Rakhshani T, Khiyali Z, Masrurpour F, Khani Jeihooni A[14]	Effect of Educational Intervention on improvement of physical activities of middle-aged woman	Iran, 2017	Educational (Consultation, group discussion, evaluation, reaching goal)	Two-stage cluster sampling method, 160, middle-aged women	Physical activities = International Physical Activity Questionnaire (IPAQ)	**Pre**= 548.30 MET-min/week **Post**= 726.30 MET-min/week Δ = 178 MET-min/week
2	Yarımkaya E, Esentürk OK, İlhan EL, Karasu N[15].	A WhatsApp-delivered intervention promote physical	Turkey, April 27 – June 21, 2020	A private WhatsApp group and videos	Random sampling, 42, children	Physical activity= Leisure Time Exercise Questio	**Pre**= 20.04 MET-min/week **Post**= 51.23 MET-

No	Study	Title	Country And Year of Research	Form Of Intervention	Sampling Method and Number of Samples	Outcomes Related to Physical Activity	Pre And Post Intervention Results and Change Results (Δ)
		activity in young children with autism spectrum disorder				nnaire (LTEQ)	min/week Δ= 31.19 MET-min/week
3	Morais LDC, Paravidino VB, Mediano MFF, et al[16].	Effectiveness of a school-based randomized controlled trial aimed at increasing physical activity time in adolescents	Brazil, 2016	PG: general basis for a healthy lifestyle, through educational games, group debates and culinary classes focused PEG: PG + environment	Random sampling, 2511, adolescents	Physical activity= physical activity questionnaire for the adolescent	**Pre**= 219.9 MET-min/week **Post**= 280.1 MET-min/week Δ= 60.2 MET-min/week
4	Gill M, Roth SE, Chan-Golston AM, et al[17]	Evaluation of an intervention to increase physical activity in low-income,	Los Angeles; October 2014, January & March 2015	Assisting physical education teacher using PE curriculum (SPARK PE)	561 (287 intervention and 274 control), middle schools	Moderate-to-vigorous physical activity (MVPA)= System for Observin	**Pre**=16.0 MET-min/week **Post**= 61.1 MET-min/week

No	Study	Title	Country And Year of Research	Form Of Intervention	Sampling Method and Number of Samples	Outcomes Related to Physical Activity	Pre And Post Intervention Results and Change Results (Δ)
		urban middle schools				g Fitness Instruction Time (SOFIT	Δ= 45.1 MET-min/week
5	Slining M, Wills S, Fair M, et al[18]	LiveWell in early childhood: results from a two-year pilot intervention to improve nutrition and physical activity policies, systems and environments among early childhood education programs in South Carolina	Greenville, USA. June 2016 and August 2018	ECE center directors and caregivers to improve healthy eating and active living policies and practices	Randomly, 120, 3–5-year-old	PA policy= Environment and Policy Assessment and Observation (EPAO)	**Pre** = 11.76 MET-min/week **Post**= 13 MET-min/week Δ= 1.24 MET-min/week
6	Aasa B, Berglund L, Michaelso	Individualized Low-Load Motor Control	Sweden, 2014	LMC exercises: low load lifting	Randomization, 70 participants, 25-60	Patient-specific function	LMC **Pre**= 3.8 MET-

No	Study	Title	Country And Year of Research	Form Of Intervention	Sampling Method and Number of Samples	Outcomes Related to Physical Activity	Pre And Post Intervention Results and Change Results (Δ)
	n P, Aasa U[19]	Exercises and Education Versus a High Load Lifting Exercise and Education to Improve Activity, Pain Intensity, and Physical Performance in Patients with Low Back Pain: A Randomized Controlled Trial		exercise and high load lifting exercise	years	al scale	min/week **Post**= 8 MET-min/week HLL **Pre**= 4.8 MET-min/week **Post**= 7.3 MET-min/week Δ= 4.2 and 2.5 MET-min/week
7	Khodaveisi M, Azizpour B, Jadidi A, Mohammadi Y[20]	Education based on the health belief model to improve the level of physical activity	Iran, February 2018 to February 2019	Training face- to-face and educational booklet	convenience sampling method from different faculties, 130 participan	Physical activity= International Physical Activity Questionnaire (IPAQ).	**Pre**= 2,679.47 MET-min/week **Post**= 3,943.15 MET-

No	Study	Title	Country And Year of Research	Form Of Intervention	Sampling Method and Number of Samples	Outcomes Related to Physical Activity	Pre And Post Intervention Results and Change Results (Δ)
					ts, aged 25–50 year		min/week Δ= 1,263.68 MET-min/week
8	Vahedian Shahroodi M, Belin Tavakoly Sany S, Hosseini Khabosha n Z, Esmaeily H, Jafari A, Tajfard M[21]	Effect of a theory-based educational interventio n for enhancing nutrition and physical activity among Iranian women: a randomise d control trial	Iran, April 2016 to February 2017	The Pender's HPM nine 4-h training sessions and consulting support via phone contact and social media group	202, 18-50 years	Physical activity= Internati onal Physical Activity Questio nnaire (IPAQ-L)	Mean intervention = 1840 MET-min/week Mean control= 1803 MET-min/week Mean Δ= 37 MET-min/week
9	Tehrani H, Majlessi F, Shojaeiza deh D, Sadeghi R, Kabootar khani	Applying Socioecolo gical Model to Improve Women's Physical Activity: A Randomize d Control	Iran, NA	Education al multimedi a and conducte d on 4 levels of personal, social,	360, 22-40 years	Physical activity= internati onal physical activity question naire (IPAQ)	**Pre**= 992.17 MET-min/week **Post**= 3604.32 MET-min/week

No	Study	Title	Country And Year of Research	Form Of Intervention	Sampling Method and Number of Samples	Outcomes Related to Physical Activity	Pre And Post Intervention Results and Change Results (Δ)
	MH[22]	Trial		organizational, and political			Δ= 2612.15 MET-min/week

Table 1 The Characteristic Article

DISCUSSION

The purpose of this study was to determine the review of the impact of educational programs on physical activity based on research that has been done. The results of the Systematic literature review found that participants consisted of children, adolescents, and adults. Health conditions in research subjects from nine articles also varied, some were healthy, autistic, eye pain, and low back pain. The results of the review found that those who produced high physical activity change outcomes were given a comprehensive intervention and a behavior change approach.

The expected result of the educational program is a change in better behavior, in this case, physical activity. The intervention in the article review found that two interventions that use behavior change theory, namely the health belief models theory [20] and the social-ecological model theory [18,22]. Health belief models are theories that focus on individuals [23], three factors that play a role, namely the readiness of the individual, encouragement from outside the individual, and how the behavior itself. While social ecological theory, in addition to individuals, this theory focuses on interpersonal relationships, organizations, and policies that play a role in creating behavior[24]. The subjects in the three articles that used the behavior theory approach were in poor health and different age groups, but two articles were in the adult age group and healthy conditions. The outcome of physical activity that we can see in the two articles that use the theoretical approach results in high physical activity changes from other interventions and looks higher in those that use social ecological theory.

Physical activity in different age groups and health conditions is a limitation of this study because it cannot be compared. A healthy person will have higher physical activity compared to a sick person, as well as the general adult group has higher physical activity than children and the elderly. This limitation can be taken into consideration in future research.

The results of the review of this article also found that the interventions provided included

various methods, namely (1) literacy in the form of booklets and policies, assisting, curriculum (2) face-to-face, namely seminars, FGDs, consulting, classes, and debates (3) technology using WhatsApp, social media, phones, and multimedia, (4) exercise, and; (5) provision of infrastructure. All interventions in the articles use literacy methods, six articles that use face-to-face methods, four articles use technology methods, two articles use physical exercise, and two articles use activity infrastructure. Interventions that use all methods are obtained in one article [22,25], with the highest outcome results, namely a change of 2612.15 MET-min/week.

Physical activity is a behavior in the community that is difficult to change, so it requires great effort, not only through health education, but there must be health promotion efforts which include advocacy, assimilation, and community empowerment.

CONCLUSION

Sufficient physical activity behavior is a lifestyle that needs to be implemented in society to live a healthy life. One form of effective and efficient promotion of physical activity is by providing educational programs. Based on our literature review found that comprehensive educational interventions produced high changes in physical activity in healthy participants. The level of change in physical activity in the community needs to take into account the participant's health condition, the next literature may be reviewed enhancing of physical activity among people with similar health conditions and age.

Limitation of Study: In this research, only nine eligible articles were obtained from three database sources and search for relevant articles from other sources. It is necessary to add additional database to obtain more specific educational programs based on similar health conditions and age.

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