

Online-Based Intervention as an Effort to Increase Physical Activity Among Adolescent

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ABSTRACT

Background: Physical inactivity (PA) is an important contributor to morbidity and mortality globally. Adolescence is an important period of engaging in physical activity. 2 systematic reviews before 2022 concluded that studies need more methods and evaluations to prove the continued effect of Online-based interventions. It is therefore prudent to continue this research by considering how we can approach young people to grow healthy values into their day-to-day activities.

Purpose: This study aims to determine online-based interventions for physical activity in adolescents.

Method: A search of the literature databases Scopus, Science Direct and Springerlink using key words 'Adolescents', 'Teenagers', 'E-health', 'Internet-based', 'Online-based', and 'Physical Activity' limited to 5 articles which fit the criteria for inclusion. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol was used, and papers were excluded if they were disease focused, not specific to adolescents or did not measure PA as an outcome.

Results: All of studies had significant increases in PA as a result of an Online-Based intervention. Studies include using various implementation mechanisms. The majority of studies use a mix of web- tutorials and based lessons for participants to work on in addition to goal setting via online, app-based (4/5). That remaining studies they were given an accelerometer as a measuring device and instructed online to perform the physical activity used for the rest of the study using online forums and PA experts to emphasize the effect of goal setting. Various intervention such as giving messages about PA or Health related issues were performed few a week for about 2-3 month.

Conclusion: Online-based interventions are a very successful way to increase PA. More research is required to look at what theoretical principles are best to underpin interventions and also to assess the length of intervention required for optimal results after intervention. Ideas surrounding implementation require more studies to evidence base these interventions for schools, via intracurriculum or extracurriculum.

Keywords: adolescents, e-health, intervention, physical activity, teenagers

Received February 10, 2024; Revised March 12, 2024; Accepted April 3, 2024

DOI: <https://doi.org/10.30994/jnp.v7i2.513>



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BACKGROUND

The impact of the COVID-19 pandemic can add to new problems that occur in adolescents. Problems are caused by change previous adolescent habits, especially in the habit of physical activity (Martín-Rodríguez et al., 2022). Decreased physical activity in during the pandemic because the learning process is carried out online. During the Covid-19 pandemic in Shanghai, China, children aged 6-17 years in five schools showed that the prevalence of physically inactive by 21.3% to 65.6% (Zhang et al., 2020). Decreased physical activity during the pandemic COVID-19 which will have a negative impact on health conditions (Dana et al., 2021). Research in Latin America on Adolescents aged 16-19 years during the lockdown showed 2.98 times being inactive (odds ratio (OR) = 2.98) (Redig et al., 2022). Lifestyle behaviors, such as physical activity and sedentary behavior have a drastic impact due to school closures and social restrictions during the COVID-19 pandemic (Ahmed et al., 2021).

E-health interventions are becoming increasingly popular method for delivering public health programs during pandemic and it seems very suitable to involve young people who are digital natives (McIntosh & Jay, 2017). Various benefits of E-health covers cost, efficiency, knowledge, travel and communication (Sartori et al., 2020a). There are however unforeseen consequences associated with E-health interventions. Medical professionals must critically analyze each implementation to avoid exacerbations problems surrounding the increasing difficulty of interpersonal care.

Increasing burden of non-communicable diseases worldwide is an epidemic that will not diminish without consider methodological approaches to changing culture choices and norms (Campion et al., 2022). Potential Online-based interventions essential tool with the capacity to achieve most from the population quickly. Prevention of conditions caused by lack of PA has become an integral part of current progress in technology and E-health (Alshahrani et al., 2021a). This review covers the following Online-based modes: web-based applications including online applications, webinars, websites and electronic communication. This systematic review aims to assess effectiveness of Online-based interventions to improve PA levels in young people.

METHOD**Study Design**

A systematic literature search was performed in January 2022 in Scopus, Springer Link and Science Direct using key words 'Adolescents', 'Teenagers', 'Online-based', 'Internet-based', 'Online-based', and 'Physical Activity'. Literature published before 2018 was not included.

Study Selection

The total number of articles identified was 1483 articles. Then Tittle screening and 230 articles remaining for eligibility review. Screened articles based on title identification and inclusion and exclusion criteria. Full text article eligibility test are 6 articles left for review (Figure 1).

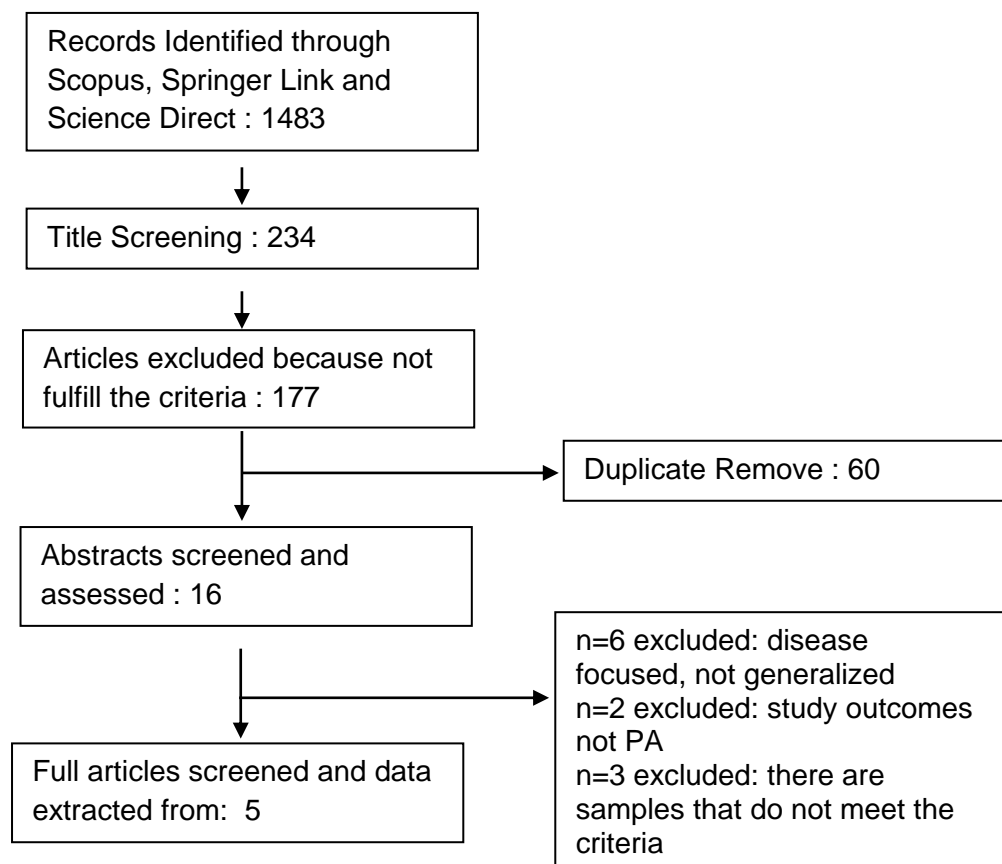


Figure 1. Flowchart of the Articles Selected for the Systematic Review and the Selection Process Using PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses).

Types of Study

Study designs of all types were included if inclusion criteria were met. The Inclusion of this study are Any intervention to change PA level within Online-Based. This study aims to include all research currently available for review to inform the best results. Studies limited to articles written in English. The search results obtained 5 selected articles from 1483 articles found from the database that matched the inclusion and exclusion criteria. (Table. 1)

Table 1. The PICOS format of this study

PICOT FRAMEWORK	CRITERIA
Population	Adolescence who attend school or collage
Intervention	Any Intervention within online-based
Comparison	There is no comparison in this study
Outcome	Physical Activity Level
Study Design	Any Design except Systematic Review or Literature Review
Language	English
Time	2018-2022
Exclusion	Not focused on disease

Types of Participants

The included studies did not focus on disease. Study must represent young people or adolescence. Studies were only included if participants are students who attend school or colleges. Type of intervention, underlying theory, PA yields and measures were extracted by authors.

Type of Interventions

This included criteria study, research must include web-based or Online-Based intervention. Interventions not based on Online-based excluded.

Outcomes

The included study measured the effect of the intervention on PA level as primary or secondary outcome.

RESULTS

Seventeen articles were identified for full review. Five studies with a total of 4064 participants met the inclusion criteria. Of these, one is randomized control trials, two are experimental study designs, one is a cross sectional study and one is a quasi-experimental study.

Intervention

Studies include using various implementation mechanisms. The majority of studies use a mix of web- tutorials and based lessons for participants to work on in addition to goal setting via online, app-based (4/5). That remaining studies they were given an accelerometer as a measuring device and instructed online to perform the physical activity used for the rest of the study using online forums and PA experts to emphasize the effect of goal setting. All studies after the analysis explained about the PA as a primary or secondary outcomes. The research sample in each study was >18 years old. Various intervention such as giving messages about PA or Health related issues were performed few a week for about 2-3 month (Table 2).

Table 2. Summary of Selected Studies

Author	Country	Design	Sample	Instrument	Method	Variables	Result
Amanda et. Al., 2022	USA	Experimental study	1428	Moderate-to-vigorous physical activity (MVPA)	EAT-I, EAT-II, EAT-III, Weight-motivated exercise were frequently asked	Physical activity, Exercise, Motivation, weight stigma, adolescent	Weight-motivated exercise have a some influence on MVPA for females with higher BMI and have a big influence on older males.
Amir, 2021	Iran	Experimental study	68	Physical Activity Behavior	Intervention groups were trained for three months and two sessions per week within the online physical education classes in a WhatsApp mobile	COVID-19, Exercise, Intervention, Motivation, Adolescents	The participants in the intervention group reported higher perceived physical activity level (2.4 vs. 1.11,

					application.		P<0.001) in the post- test in comparison to those in the control group.
Ali, 2019	Iran	Quasi Experimental Study	200	Physical Activity Performed	Educational intervention was performed in 10 educational sessions 50–55 min for the experimental group.	Obesity Overweight PRECEDE model Nutrition Physical activity	Educational programs based on precede model has influence on the changes of predisposin g factors (knowledg e, attitude, self- efficacy), reinforcing and enabling factors of physical activity
Chiew, 2019	New Zealand	Cross- sectional study	314	Moderate-to- vigorous physical activity (MVPA)	Perceived changes in frequency of PA (PA, Days of >60min MVPA/week, (online)	Accelerometer; Adolescent; Physical activity; Schools; Transportation; Walking	Adolescent girl within Active Transport have higher number of Physical Activity score
Amal,2021	Saudi Arabia	RCT	120	Global Physical Activity Questionnaire (GPAQ)	They got 3 or 4 health- promotional (physical activity) messages from the literature review recommendation per week via WhatsApp for 10 weeks.	health promotion, mobile applications, physical activity, social media, WhatsApp	Social- network- based interventio ns improve physical activity and may be incorporate d into youth- targeted health programmes

In assessing bias and methodological quality this systematic review used the Joanna Briggs Institute (JBI) critical appraisal checklist tool. The risk of internal bias from each study after a critical appraisal is carried out with an average value of > 80%, this shows that the

study is worthy of being used as a systematic review in making this systematic review article.

Outcomes

The effect of the intervention is indicated by changes in the proportion of students before and after interventions reporting physical activity across all domain. There was an increasing proportion of students reporting physical activity across all 3 domains and all

categories of physical activity. Very interesting to note that of the 6 participants who were not active in the intervention groups, 4 activities reported in the post-intervention analysis, while 1 in 5 in the control group showed a shift. This are important findings highlighting the effectiveness WhatsApp-based physical activity intervention (Alshahrani et al., 2021).

Women who reported weight-motivational exercise carried out on average more than 30 minutes more MVPA five years later. In males, the association does not statistically significant, although those who reported weight loss motivated workouts have an average of nearly 20 minutes higher MVPA five years later. These results for both men and women can be clinically significant as to whether a person meet the recommended amount of PA for health benefits (Folk et al., 2022). For another study, they stated that online-based interventions can significantly affect PA after the intervention has been in place for some time (Jeihooni et al., 2019; Rahman et al., 2020).

DISCUSSION

This review found that most online-based interventions ported statistically significant improvements for at least one PA outcomes in adolescents. Interventions range from single to multiple components with strategies, such as PA alone or a combination of PA sessions, health education, and/or use of educational materials to promote PA. However, the findings are inconsistent because the number of studies that met the inclusion criteria was relatively low, methodological quality, and/or small sample size.

The results of this review indicate that single (such as PA only) or multicomponent including education plus PA and/or PE sessions and/or educational materials, and short-term programs (eg >6 months) intervention may be a promising strategy to increase PA among adolescence. This is supported by evidence reported in other reviews the multicomponent interventions that incorporate PE classes; involve health education sessions sion; offer PA during and after school time; and involve family members seem to be more effective than a single strategy intervention(Dana et al., 2021; Kek et al., 2019; Sartori et al., 2020).

For women, the relationship between weight motivation exercise and MVPA are different from BMI. At lower BMI levels, women who support vigorously motivated exercise report higher MVPA rates five years later. On the other hand, at a higher level BMI, those who favor vigorously motivated exercise tend to reported a lower MVPA five years later. This difference may be caused by the use of exercise as a means of achieving pervasive thin beauty ideal is connected with stereotyped feminine identity, attractiveness, and acceptability (Jeihooni et al., 2019).

Young people's ability to achieve and sustain increases in CL may be largely determined by social level support available to them. Simple method to increase PA which can be targeted to individuals including walking to school/college, cycling or joining a local sports team. Without appropriate social support in place, young people may face insurmountable barriers to participation, with the youngest the most vulnerable groups. Some of the frameworks used considering the control each individual feels on their abilities to take part in the exercise, but without a mechanism to cope identified barriers, the intervention is unlikely to succeed. One study found that individuals who felt that they had more support from siblings improves PA by walking to school again (Cook et al., 2014).

Other reviews reveal that the focus on changes in some health behaviors instead of just focusing on single strategy seems to be more successful (Jeihooni et al., 2019). To increase PA, successful studies tend to intervene for shorter periods. It is possible that participants may have captured the effects of interventions with short-term follow-up and, therefore, tend to make positive changes in their behavior, which are consistent with a previous review.

CONCLUSION

Online-based interventions can be used to increase PA at a young age people. More research is needed to determine the best theoretical framework to support PA interventions for this population. There are various social barriers to necessary PA addressed when designing interventions and therefore E- Health interventions may need to be tailored to the demographics of a population.

ACKNOWLEDGMENT

The author would like to thank the Faculty of Nursing and the Masters of Nursing Study Program for providing the opportunity for us Masters of Nursing students to present this research.

CONFLICTS OF INTEREST

No Conflict if interest have been declared

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