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Integration of self-efficacy in digital-based physical training in increasing physical activity of young women

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ABSTRACT

This study aims to test the integration of self-efficacy into physical training digitally by increasing the physical activity of young women. Social Cognitive Theory (SCT), by integrating self-efficacy in training and rehabilitation programs, has been used to address health problems. With the help of social support, a person's physical activity can be predicted. This study is based on the low physical activity of young women during the COVID-19 pandemic, which can affect the quality of health and social development. This study is an experimental study using a randomized pretest-posttest control group design. The instrument used to collect the data is the International Physical Activity Questionnaire (IPAQ) for young and middle-aged adults (15-19) and then processed with independent t test analysis techniques. The results of the average scores of knowledge, attitudes, and levels of physical activity in the control group did not differ markedly before and after the intervention. Whereas in the experimental group, the difference before and after the intervention was significant (t_{count}= 6.9159; t_{table} 1.6848 and 2.022; $t_{count} > t_{table}$), and the average value of the aforementioned factors increased after the intervention. The results of this study revealed that the use of digital media in physical exercise with the integration of self-efficacy can increase the physical activity of young women, and digital media can be effective in improving health-based behaviors. Sociodemographic variables such as the level of motor skills appear to be significant predictors of self-efficacy for coping with sedentary behavior. Understanding self-efficacy predictors for coping with sedentary behavior can help physical education integrate the emotional dimensions of health into physical education interventions, identify groups based on level, customize messages, and prioritize resources in shaping pro-health behavior.

Keywords: Self efficacy; digital; physical training; physical activity; young women

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INTRODUCTION

Promotion of physical activity is an important part of health promotion policy to prevent childhood obesity and promote the general health well-being of children (Lee et al., 2017). However, according to a global study, about 50 percent of children (Griffiths et al., 2013) and 80 percent of youth live worldwide (Hallal et al., 2012). Young people's direct participation rates in physical activity are low worldwide, especially among

young women (Hallal et al., 2012). Physical activity is empirically indicated for improving the quality of health (Cesa et al., 2014), as is mental health (Lubans et al., 2016). Physical activity is any body movement produced by skeletal muscles that requires energy expenditure (WHO, 2015). It can be done in different ways: walking, cycling, sports, and other forms of active recreation (e.g., dancing, yoga, tai chi, weight training). These activities can also be carried out in the activity part of the work (for example, lifting, carrying, or other activities). As part of household tasks around the house (e.g., cleaning, carrying, and caring tasks), these can provide mental or social health benefits if done regularly and with sufficient duration and intensity (WHO, 2018). The beneficial effects of regular physical activity on many health outcomes are well documented (Pedersen & Saltin, 2015). Studies have shown specific benefits, such as improving physical health parameters physiologically and psychically (Chekroud et al., 2018).

Adolescents and young adults are becoming key objects in global health and international development. They are considered an important factor for the success of a country's development program, so clearly many countries make policies to bring them to the forefront of national development (United Nations, 2014). The Indonesian state is also adopting a more holistic approach to adolescent health, and human rights should expand public health efforts. The government realizes the importance of physical activity with policies related to the Strengthening the Healthy Living Community Movement (Germas) program in the 2020-2024 RPJMN IV (Peraturan Presiden Republik Indonesia Nomor 18 Tahun 2020) whose objectives include encouraging community physical activity. The strategy articulates the need for adolescent-responsive health systems as well as social determinants, a focus that extends to the legal and policy environment (Temmerman et al., 2015) in the prevention of the risk of non-communicable diseases in the future. Including cardiovascular diseases, cancer, and musculoskeletal and metabolic problems, these commonly appear during adolescence (Sawyer et al., 2012).

As the COVID-19 pandemic continues to develop in almost all regions, authorities have implemented various protective measures, including closing schools and universities and banning travel, cultural and sporting activities, and social gatherings (Parnell et al., 2022). People have been asked to stay home, and several countries have asked all returning tourists to isolate themselves for four nights. All of these actions are part of the government's strategies that are considered effective in preventing the spread of the virus and controlling the infected. This official appeal is complied with by all levels of society. However, as a consequence of the COVID-19 pandemic, several precautionary measures were taken, such as social distancing, lockdowns, and school closures (Rundle et al., 2020). Negative impacts related to COVID-19 have resulted in decreased physical fitness, increased sedentary lifestyles, and decreased quality of life (Lemes et al., 2021; Rundle et al., 2020). During this period, there was a space restriction for physical activity, resulting in an increase in obesity rates experienced by children and adolescents (Stavridou et al., 2021). In this context, high-intensity physical activity to improve physical fitness is difficult to define, mainly because of the motivational aspect (Lemes et al., 2021; Vidoni & Ferraz, 2019).

The health emphasis based on behavioral analysis offers opportunities to increase daily physical activity (Dounavi & Tsoumani, 2019). Therefore, it is very important to explore health interventions that can be easily followed by the general public. Therefore, it is very important to learn various methods of prevention that the general public can easily follow (Das & Horton, 2012; Gardner et al., 2016; Parrish et al., 2020; Zhang et al., 2022). Online physical training interventions are promising because they involve fewer contacts and lower costs but allow for greater flexibility, convenience, and accessibility (Filion et al., 2015). The development of digital technology has touched the practice of improving the quality of health with the birth of the concept of mobile health intervention (mHealth), which refers to medical and public health practices supported by cell phones and patient monitoring tools. Personal digital assistant (PDA) and other wireless devices (Ryu, 2012). Digital media, such as mobile fitness apps and health-related websites, can offer new physical activity intervention strategies for sedentary young women (Zhang et al., 2022) Intervention duration in studies can range from 3 weeks (Miragall et al., 2018) to 6 months (Miragall et al., 2018) to 6 months (Fukuoka et al., 2019).

Socio-cognitive variables include personal beliefs sensitive to the history of reinforcement and social influence. However, theory-based research examining which socio-cognitive factors are the most critical

influences on physical activity among adolescents is still limited (Amnie, 2018). Self-efficacy (SE), which is one of the variables in cognitive and social theory (SCT), is a belief in a person's ability to be successful in a particular task, course, or subject area (Mendoza-Vasconez et al., 2018) and that is one of the motivational aspects (Marshman et al., 2018). SE can influence a person's interest, affecting engagement during learning (Schunk & Pajares, 2002). In particular, SE can have significant long-term effects because it can push students into feedback circles that can impact SE and student performance positively or negatively (Marshman et al., 2018).

Studies related to increasing physical activity have been carried out by several experts, as stated by Peyman and friends. They utilized digital media to increase physical activity in adult women (age 31.933 9.458 in the control class and 33,411 9.010 in the experimental class) (Peyman et al., 2018) , as well as research conducted by Nelson et al (Nelson et al., 2019) who investigated differences between estimates of sedentary ry behavior and physical activity in undergraduate students and boys (a20.3 .3 1.6 years) and womeagege 20.3 & 1.2 years) (Petbehavior and physical activity in undergraduate students and boys (age 20. t 1.6 years) and women (ages 20.3 & 1.2 years). A web-based cross-sectional study was also conducted on Bangladeshi university students in 2021 (participants n= 1.602 in the 22-25 year age group) (Hossain et al., 2022). This research update is related to increased physical activity that is only done by young women for different purposes. 13-19 years old use the web as a medium of training. This study focuses on practical applications and recommendations for certain physical activities that can be done at home for young women who are not physically active through physical education. Therefore, researchers want to conduct research related to digital physical conditioning training with HIIT by integrating self-efficacy to increase physical activity in young women.

METHOD

This study uses a quantitative approach with an experimental design (Creswell & Creswell, 2018) to evaluate how this operation affects the target result (or outcomes). The activities carried out collect information from pre-tests and post-tests about the level of physical activity of students. form of integration of SE in physical training with their burden on the physical activity of young women.

The population is a generalized area consisting of objects or subjects with certain qualities and characteristics set by the researcher to be studied, and then conclusions are drawn (Creswell & Creswell, 2018). The population of this study is female students of State High School (SMA) 5, Jambi City, located in Telanai Pura District, with a total of 674 (source: The Basic Level of Education of the Directorate General of Early Childhood Education, Basic Education, and Secondary Education of the Ministry of Education and Culture (semester 2020-2021 even). The proportional random sampling technique involves sampling in such a way that each member of the population has an equal chance of being selected. The research data were obtained using the International Physical Activity Questionnaire (IPAQ) for young and middle-aged adults (15-19) to measure the physical activity of students (Mehta et al., 2018) IPAQ, which will be used, consists of seven statements whose assessment uses the IPAQ application.

The measures were given to participants in groups of 6-10 girls by trained data collectors in the even semester of 2022, when students were in grades 10 and 11, before and after girls participated in interventions and control conditions. The program used in this study is in the form of interventions carried out based on guidelines for the physical activity of children and adolescents, which are based on the HIIT model and have been adapted to the school curriculum. The physical activities of children and adolescents 1) Increase the initial time spent on physical activity by 30 minutes per day and start with moderate physical activity, 2) Physical activity can be accumulated throughout the day for a minimum of 5 to 10 minutes. (3) The duration of the increased physical activity of 90 minutes should include 60 minutes of moderate activity (e.g., brisk walking, skating, cycling) and 30 minutes of vigorous activity (e.g., running). 4) Participates in various types of physical activity, such as endurance, flexibility, and strength. 5) Begin to reduce time for sedentary behavior such as watching television and videos, playing computer games, and accessing social media via smartphones. Start with 30 minutes less of these activities per day and build up over about three months to 90 minutes less

per day. Training volume (repetition and duration) is always increased in weeks 0-4, 5-8, and 9-12 (Cvetković et al., 2018).

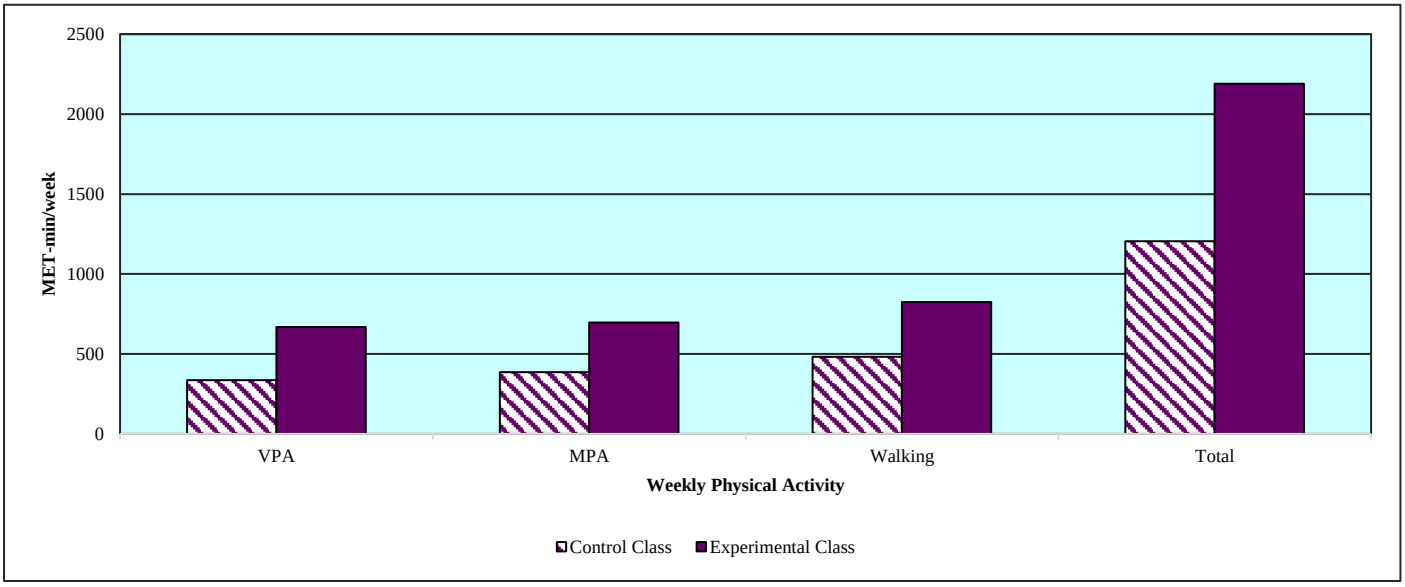
Weight training at one's own weight is a comprehensive, school-based, 2-month intervention that emphasizes changes in teaching and the school environment. It is designed to increase physical activity in high school girls by creating a school environment that supports unique physical activity needs. And the interests of the young women. The intervention adopts a social-ecological model that emphasizes the key features of the social cognitive theory to improve girls' self-efficacy for physical activity. Interventions Self-weight training is organized according to the Coordinated School Health Program model. Intervention staff assisted teachers in intervention schools, who then developed a HIIT model designed to help young women (1) improve their self-efficacy of physical activity through successful experiences with physical activity both inside and outside of school and (2) develop the physical and behavioral skills necessary to adopt a physically active lifestyle during adolescence and maintain it until adulthood. Teachers in each school develop instructional units of behavioral skills that emphasize the acquisition and practice of self-regulatory behaviors (for example, goal setting, time management, identifying and overcoming obstacles, and self-reinforcement). Schools under conditions of control do not accept intervention. However, most students in control schools complete two full academic months of standard physical education as mandated in the curriculum.

This study used a one-line variance analysis technique to test the differences between several average groups, where only one independent variable was divided into several groups and one dependent variable. In independent technique samples, the t-test is usually used in experimental research.

RESULTS AND DISCUSSION

Based on Figure 1, we can obtain information about young women's physical activity every week. (1) average weekly high fisk activity in young women was obtained at 336 MET-min/week VPA for the control class and 669 MET-min/week VPA for the experimental class, (2) the average weekly Medium fisk activity in young women was obtained at 386.5 MET-min/week MPA for the control class and 696 MET-min/week MPA for the experimental class, (3) the average fisk activity walked in one week in young women was obtained 481.39 MET-min/week walking for the control class and 824.59 MET-min/week walking for the control class and 824.59 MET-min/week walking for the control class and 824.59 MET-min/week walking for the control class and 824.59 MET-min/week walking for the experimental class, (4)) average weekly fisk activity in young women as a whole was obtained 1203.89 MET-min/week total for the control class and 2189.59 MET-min/week for the total experimental class. It can be seen that the integration of self-efficacy in online learning can increase the physical activity of young women. Improving the self-efficacy of young women in online physical exercise has a significant impact on increasing adolescent physical activity. This research also supports the opinion (Gacek et al., 2020). The higher the level of physical activity carried out by students with a higher sense of self-efficacy, which can be attributed to the belief that certain goals, that is, those related to health, may be achieved by exercising control over the determinants of health, an active lifestyle occupies a very significant position.

Descriptive statistical test results



Graph 1. Average Weekly Physical Activity of Young Women Jambi

After conducting the assumption test, the next step is to test the hypothesis. The test in question is a dependent sample t-test to determine the influence of free variables (integration of self-efficacy in physical exercise) on bound variables (physical activity of young women). The independent results of the sample t-test in detail are presented in table 2.

Table 2. Independent description of the sample t test between the control class and the experimental class

Group	Observations	t	t_{table}	
			Critical one-tail	Critical two-tail
Control	40	6,9159	1,6848	2,022
Experiment	40			

There was a significant and positive difference between the control and experimental groups (t_{count} = 6.9159; t_{table} 1.6848 and 2.022; $t_{count} > t_{table}$). This means that a load of self-efficacy in physical exercise can increase the fisk activity of young women, and the behavior of the activity can last longer. Referring to the results that show the integration of self-efficacy in Physical exercise online that is generalized to have a positive impact on the increase in physical activity, it is necessary to understand that the strengthening of self-efficacy, that is, through psychological techniques, can be viewed as conducive to the performance of physical activity regularly, and in promoting health, as confirmed in adolescents in Germany (Zhou et al., 2016), Asia, South Africa (Ah Hong et al., 2017) and American scientists (Voskuil & Robbins, 2015).

American researchers, apart from the importance of a sense of self-efficacy, also found that taking and maintaining the performance of a physical activity is positively influenced by a sense of pleasure derived from physical exercise (physical activity from a hedonistic perspective) (Lewis et al., 2016). Other studies have also described self-efficacy as significantly predicting the physical activity of students in China (Chan, 2014), Malaysia (Ler et al., 2017), as well as adolescent students from South Korea (Lee et al., 2018), and Australia (Plotnikoff et al., 2013). The results showed a significant increase in the physical activity of young women who used self-efficacy-charged physical exercise compared to the control group. This shows the positive impact of the integration of self-efficacy and the media as an intervention in physical exercise on health promotion (Peyman et al., 2018).

The results of this study agree with the results of the project investigation (Nazari et al., 2020) also examined the influence of web-based education on the physical activity of female students who received education via the internet for four weeks. By the end of the study, the average number of steps per day had

increased by 38.8% among the group that received education through the internet. The results of this study also show a positive influence of internet and web use on physical activity.With the rapid growth of digital media, including the internet and mobile phones, as well as the increasing number of people who have access to such media, the use of such media seems necessary to encourage physical activity (Chou et al., 2013). The strength of this medium, compared to print media and face-to-face interventions, is to educate many people at a low cost (Hieftje et al., 2013).

Sedentary behavior is any waking behavior characterized by a metabolic equivalent of 1.5 energy expenditure, such as sitting, lying down, or lying down (Tremblay et al., 2017). Examples of bodyweight training for the upper and lower body include push-ups, squats, lunges, box jumps, jump roping, burpees, etc. Benefits of weight training for musculoskeletal health and functional capacity, for example, it has been shown that plyometric exercises and resistance exercises with slow movements can improve physical function (Kikuchi & Nakazato, 2017). In addition, ten weeks of body weight training improves some aspects of body composition and physical fitness components, including strength, flexibility, and aerobic capacity (Lipecki & Rutowicz, 2015).

Nazari et al. (2020) also conducted web-based interventions among students. Research shows an increase in students' attitudes and knowledge of physical activity and shows the positive effect of internet-based interventions on their knowledge and attitudes (Nazari et al., 2020). Knowledge of the risks and benefits of lifestyle-related behaviors is a prerequisite for carrying out a behavior. If people do not have relevant knowledge, they will not accept the reasons for enduring the difficulties associated with that behavior. This research also proves that digital media can provide information in a short time and is very efficient. It has a significant impact on student's knowledge and literacy.

In this study, in addition to a significant increase in physical activity, women's knowledge and attitudes also increased significantly after the intervention, while no improvement was observed in the control group. This suggests that digital media, such as the internet, computer software, and mobile phone-based programs, encourage women to engage in physical activity and improve their knowledge and attitudes. Knowledge, attitudes, and behaviors in our daily lives are interrelated with each other. A change in knowledge leads to a change in attitude. Changes in attitudes also cause changes in behavior. Educational programs using digital media, such as the internet, computer software, and mobile phone-based ones, are effective in increasing knowledge and attitudes toward doing more physical activity.

This study has limitations. Because this study has a pretest-posttest design using convenience sampling from one center, there are limitations in explaining a clear causal relationship between social support, self-efficacy, physical exercise, and physical activity and in generalizing the results of the study. Therefore, future multicenter longitudinal or cross-sectional studies using larger samples are needed. In addition, because the study was conducted online, the results may be overstated or underestimated due to controls when applying the treatments. Further studies are needed to identify different levels of physical activity by considering demographics such as economic level, basic movement skills, body mass index, and sports background.

CONCLUSION

Understanding the forms of movement in sports, the use of self-efficacy components in physical education classes, and the use of media in sports can have a positive impact on the physical activity of young women. The results of this study are convincing enough to warrant investment in further research on physical activity in boys and adolescents in the COVID-19 pandemic.

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CONFLICT OF INTEREST

The author declares that there are no conflicts of interest in writing this article.

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