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Advendi Kristiyandaru 
Universitas Negeri Surabaya, Indonesia

Muchamad Arif Al Ardha 
Universitas Negeri Surabaya, Indonesia

Kolektus Oky Ristanto 
Universitas Negeri Surabaya, Indonesia

Lutfi Nur 
Universitas Negeri Surabaya, Indonesia

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Advendi Kristiyandaru, Muchamad Arif Al Ardha, Kolektus Oky Ristanto, Lutfi Nur

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Abstract

The physical fitness course is a mandatory subject for undergraduate students at Universitas Negeri Surabaya, Indonesia. However, there is limited physical activity possibly performed during the COVID-19 pandemic. Furthermore, conventional physical fitness tests and measurements could not be conducted in a conventional way. This study aimed to test the possibility of the Personal Physical Fitness Test (PPT) being implemented by college students who were enrolled in a physical fitness course. There were 1.639 college students aged 18 ± 0.81 years old who participated in this study. The independent physical fitness test was designed to represent several physical components i.e., standing board jump (lower body strength), Plank (core strength), push-ups (upper body strength), and one-minute skipping (cardiorespiratory). The data were in the normal distribution. Male students performed better than females in every test ($p < 0.05$). Furthermore, the data were categorized on each test based on gender. The categories are excellent, good, fair, poor, and very poor. In a further study, the personal physical fitness test could be implemented in a larger sample size.

Introduction

The global coronavirus (COVID-19) pandemic became a nationwide lockdown (Coulthard et al., 2021). COVID-19 cases and deaths were increasing every day have led to lockdowns, quarantines, and some restrictions around the world (Atalan, 2020). Lockdowns have a substantial environmental impact, as traffic pollution and industrial emissions are important factors affecting air quality and public health (Lian et al., 2020). These forced restrictions led to significant changes in the way of life, with consequences that are still being studied and understood. One of the aspects that drew particular attention was the swift drop in pollution levels in various cities across the country. Such a drop was noticeable within just a few days, sparking discussions about the potential of lockdowns being effective alternative measures to control air pollution (Mahato et al., 2020).

The COVID-19 pandemic has prompted many public health response measures including social distancing and school cancellations (Johnson et al., 2021). These measures, while necessary to curb the spread of the virus, had

unintended side effects. One area significantly impacted was sports (Rowe, 2020). The sudden rise of the coronavirus in the world has an impact on various sports industries (Ke & Wagner, 2020; Keshkar et al., 2021). Many sports events were delayed and regulated strictly (Håkansson et al., 2020). Furthermore, there were only limited physical activities could be performed during the pandemic. As a result, there were more people get depression and anxiety which were associated with bad feelings (Johnson et al., 2021).

The COVID-19 pandemic has brought significant challenges and disruptions to various aspects of our lives, including the realm of education. In the context of higher education, universities have had to adapt their teaching methods and curriculum to ensure the safety and well-being of their students. Health education, specifically focusing on physical fitness, has become even more crucial during these unprecedented times (Gray et al., 2020). Health education is a fundamental tool for individuals to adopt healthy lifestyles, prevent diseases, and protect themselves. This education promotes health consciousness and encourages healthy behaviors such as proper nutrition, regular exercise, hygiene habits, and stress management (Schulz et al., 2020; Teare & Taks, 2021). Especially during pandemic periods like COVID-19, the importance of health education is further emphasized. Teaching people preventive measures to avoid disease transmission, providing access to accurate information, and increasing awareness about health play a critical role in safeguarding public health. Health education enables individuals to make informed decisions regarding their health and supports the adoption of a healthier lifestyle. Therefore, health education is recognized as a significant element for the well-being and welfare of society (Li et al., 2020).

Furthermore, there were only limited physical activities could be performed during the pandemic. As a result, there were more people get depression and anxiety which were associated with bad feelings (Johnson et al., 2021). Not being able to participate in sports and other physical activities also led to additional health issues, including weight gain and associated complications due to a lack of physical movement.

On the other hand, adolescents who exercised during the COVID-19 pandemic had fewer symptoms of anxiety, depression, and better quality of life scores compared to people who did not exercise (McGuine et al., 2022). The most favorite sport during the COVID-19 pandemic is cardio sports including aerobic activity which was carried out at home (Nugraha et al., 2020). Three trends in sports and physical activity as a result of the COVID-19 pandemic are predicted: (1) youth preferences from organized to non-organized contexts are becoming greater; (2) reasons for participating in sports or shifts in physical activity for adolescents as well as parents/guardians; (3) consumers reconceptualize the expectations of values from sports organizations and youth physical activity (Teare & Taks, 2021; McGuine et al., 2022; Nugraha et al., 2020).

During the pandemic, people also pay more attention to recreational sports. It became one of the most important lifestyles to get the value of fitness, the value of entertainment, and the value of social interaction (Ling, 2020). Professional athletes consider virtual sports are a positive thing, but also mention some specific risks. As a result, there was more participation in virtual sports during COVID-19 Pandemic (Westmattmann et al., 2021). Physical fitness is the other main consideration during COVID-19 Pandemic. However, physical fitness test requires facility and human resources which are difficult to be conducted during the COVID-19 Pandemic. The

study purpose was develop a personal physical fitness test procedure and norm that can be implemented in the COVID-19 pandemic.

Literature Review

Physical Fitness and its Importance

Physical fitness is the body's ability to perform physical activity (Rodriguez-Ayllon et al., 2018). Physical fitness is described as a state of well-being with the energy to participate in various physical activities (Sandstedt et al., 2013). Physical fitness will refer to a set of physical characteristics that a person could achieve through a process of adaptation (Reigal et al., 2020). Physical fitness should be considered as a fundamental aspect in determining the functional capacity of a person (Medrano-Ureña et al., 2020). Physical fitness greatly affects the physical condition and mind to be able to carry out the workload they face every day (Zainudin et al., 2019). Low levels of physical fitness are associated with low physical and mental health (Wouters et al., 2020; Mason, Curl & Kearns, 2016). Low physical fitness especially cardiorespiratory fitness has a strong risk factor and a stronger predictor of cardiovascular problems (Prashant & Rohilla, 2019). This shows how important it is to maintain a high level of physical fitness, for both general health and as a preventive measure against potential diseases and health issues.

Physical Fitness Components

The physical fitness component consists of body composition, muscle flexibility, muscle strength, and cardiovascular fitness (Novianto et al., 2020). Physical fitness components related to skills include speed, agility, explosive power, balance, coordination, and reaction speed (Prasetyo & Djawa, 2021). Physical fitness parameters include flexibility, agility, muscle strength, muscular endurance, power, speed, and cardiorespiratory endurance (Kim et al., 2015).

Each of these components plays a vital role in our overall health and fitness. For example, flexibility is required to perform daily work and recreational activities (de Lima et al., 2019). The level of flexibility is a good thing for health (Minatto, Ribeiro, Junior, & Santos, 2010; Vanhelst, Fardy, Chapelot, Czaplicki, & Ulmer, 2016). Flexibility in power systems is the ability to provide supply-demand balance (Impram et al., 2020). Flexibility is the breadth of motion of one joint or several joints (Suharti et al., 2019). Endurance exercises often show simple changes in VO₂max (Bacon et al., 2013). Muscle strength is an important part of a fitness program (Abou Elmagd, 2016; Sandstedt et al., 2013). It is associated with the muscle capability in producing power to support physical activity and sports. A high level of physical fitness could be achieved by optimizing the exercise in every component optimally (Gani et al., 2020). It shows how a well-rounded approach to physical fitness can contribute to overall health and well-being.

Measuring Physical Fitness - Understanding VO₂Max

Maximum oxygen consumption (VO₂max) is a physiological parameter that determines the aerobic capacity of a person (Pérez-Gómez et al., 2020). VO₂Max is describes as a person's physical fitness level (Bahtra et al., 2020).

VO₂max is used to measure cardiorespiratory fitness, aerobic function, and overall health risks (Astorino et al., 2019). VO₂max is an absolute aspect for athletes to improve their performance. VO₂max is also an excellent predictor of the risk of morbidity and mortality of disease (Webster et al., 2021; Williams et al., 2017). VO₂max is largely facilitated by the expansion of the volume of red blood cells (Lundby et al., 2017). Furthermore, cardiorespiratory fitness could be measured by maximum oxygen intake (VO₂max) (Strasser & Burtscher, 2018). Low values of VO₂max are associated with an increased risk of death and loss of lifestyle independence in adults and the elderly. (Myers et al., 2002). While high cardiorespiratory fitness values have been associated with a reduced risk of cardiovascular disease (Rebollo-Ramos et al., 2020).

Appropriate nutrition is crucial in supporting physical fitness. Proper intake of nutrients enables the body to perform at its best during physical activities. Nutrients such as proteins are essential for muscle repair and growth, carbohydrates provide energy, and fats are crucial for various physiological functions. Furthermore, minerals and vitamins also play a crucial role in supporting body functions like immunity, bone health, and muscle function (O'Connell, Coppinger & McCarthy, 2020).

Tips for Improving VO₂Max and Overall Physical Fitness

Improving VO₂Max and overall physical fitness requires a multifaceted approach encompassing various aspects of physical fitness, nutrition, and lifestyle habits. Incorporating regular physical activities and a balanced diet is the first step towards this goal. For instance, incorporating high-intensity interval training (HIIT) in your routine can significantly improve your VO₂Max (Carson et al., 1996, Ahmet, 2020). In terms of nutrition, maintaining a balanced diet that provides the necessary nutrients, vitamins, and minerals can enhance physical fitness and boost energy levels. Hydration is also critical for overall health and fitness. Drinking sufficient water not only maintains hydration but also aids in nutrient transportation and joint lubrication, which are crucial for physical activities (Ghosh et al., 2013; Vancampfort et al., 2017).

The Benefits of Regular Physical Activity for College Students

Regular physical activity for college students offers numerous benefits, ranging from improved physical health to better mental well-being. Engaging in physical exercise has been shown to improve academic performance, reduce stress, and enhance mood (Abou Elmagd, 2016). Furthermore, exercise acts as a natural antidepressant by releasing feel-good hormones, known as endorphins, which can help manage mental health issues like depression and anxiety (Çekin, 2015).

In the context of the COVID-19 pandemic, numerous resources have emerged to assist individuals in maintaining physical fitness despite the lockdowns and social distancing measures. These resources include virtual fitness classes, mobile fitness apps, and online health and wellness communities. For instance, many gyms and fitness centers have started offering online classes for their members (Azizi et al., 2022). Similarly, numerous fitness apps provide a wide variety of at-home workouts that require minimal or no equipment. Online health and wellness communities offer a platform for individuals to share experiences, advice, and motivational support to maintain

physical fitness during these challenging times(O'Brien et al., 2022; Colineau& Paris, 2010).

Background of the Study

The COVID-19 pandemic has brought about a variety of changes globally, including shifts in routine, behavior, and lifestyle. One key area that has been significantly affected is physical fitness. With the enforcement of lockdowns, quarantines, and social distancing protocols, traditional means of maintaining physical fitness such as gym workouts, team sports, and outdoor activities have been largely curtailed. This sudden and radical shift in lifestyle has had a profound impact on the way people exercise and maintain their physical fitness(Mehta, Saxena & Purohit, 2020; Shamshiripour et al., 2020).

This study focuses on college students, a demographic that typically engages in a variety of physical activities ranging from competitive sports to casual gymming, outdoor adventures, and campus recreational activities. The pandemic's disruption of these activities presents a unique challenge for these individuals, pushing them to adapt to maintain their physical fitness. Exploring how these students have adapted their routines, the challenges they face, and the novel ways in which they continue to engage in physical activity amidst the pandemic is the crux of this study.

Significance of the Study

Understanding the adaptations, challenges, and needs of college students in maintaining physical fitness amidst the COVID-19 pandemic is vital for several reasons. Firstly, it can help inform future public health policies and interventions aimed at promoting physical fitness during situations that limit conventional methods of exercise. By understanding how individuals adapt their exercise routines during unprecedented circumstances, we can create more resilient health strategies that cater to such scenarios.Secondly, the insights from this study could significantly contribute to the fields of sports psychology, kinesiology, and public health. The changes in behavior, motivation, and physical fitness patterns during the pandemic offer unique perspectives and valuable information that can enhance our understanding in these disciplines.Thirdly, the study can offer colleges and universities important insights into their students' physical fitness behaviors, facilitating them in providing better resources and support for physical fitness, especially during times of crisis.

Research on the impact of the COVID-19 pandemic on physical fitness has garnered substantial interest recently. Studies by Bennet et al. (2021)and Woods et al. (2020)shed light on the decline in physical activity during the lockdown. Ke & Wagner, (2022)and Doherty, Millar & Misener (2022)provided an insight into the changes in sports, highlighting the shift towards recreational sports amidst the pandemic.Numerous studies, including those by Stathi, Fox & McKenna (2022), Scully et al. (2020)and Kwang et al. (2020), stressed the importance of maintaining physical fitness for overall well-being and mental health. The role of VO₂max as an indicator of physical fitness was discussed extensively in studies like those by Plasqui & Westerterp (2005) and (Lundby et al., 2017). Despite the existing body of research, there is a discernible gap in the literature regarding the development of adaptable fitness test procedures and norms for pandemic situations. Furthermore, there is a

scarcity of studies exploring the physical fitness behaviors of college students during the pandemic. This includes understanding their preferences, challenges, and the resources they employ to maintain physical fitness. This research aims to fill these gaps, contributing to the understanding of maintaining and enhancing physical fitness during pandemic circumstances.

Research Aim and Research Questions

The primary objective of this research is to develop a personal physical fitness test procedure and norm that can be implemented during the COVID-19 pandemic. The study aims to understand the impact of the pandemic on physical fitness and identify the various challenges encountered in maintaining physical fitness during this period. Furthermore, it seeks to provide practical and effective strategies to promote physical fitness and overall health despite the challenges imposed by the pandemic. The research questions guiding this study are:

1. How has the COVID-19 pandemic affected the physical fitness routines of college students?
2. What challenges have college students faced in maintaining their physical fitness during the pandemic?
3. How have college students adapted their routines to maintain their physical fitness during the pandemic?
4. What resources are college students using or could benefit from to maintain their physical fitness during the pandemic?
5. Can an adaptable fitness test procedure be developed for use during pandemic circumstances, and if so, what would it look like?

Method

The approach used in this study is a quantitative approach using research and development (R&D). The population in this study was undergraduate students at Surabaya State University. There were 1.639 students aged 18 ± 0.81 years old chosen by purposive sampling method. Those students enrolled and passed in the program the MPK Physical Education and Fitness course. According to Borg and Gall, the research and development (R&D) approach in education includes ten steps. The chart of the research steps is shown in the following figure (see Figure 1). The research and information collecting were involving the literature review and expert discussion. There were five test components were planned for this Personal Physical Fitness Test (PPPT). However, During the main field testing, there were only four components meet the validity and reliability requirements.

The four components of the Personal Physical Fitness Test (PPPT) which were ready for the operational field testing are as follows:

- ***Skipping***

It was used to measure coordination and cardiorespiratory ability. The calculated score is how many rounds/jumps can be made.

- ***Horizontal jump***

It was used to measure the strength of the lower body muscles. The score is calculated by how many centimeters the distance made.

• **Plank**

It was used to measure core muscle strength and endurance. The implementation of measurements by calculating how long the ability to stay in the plank position for the duration of time (second).

• **Push Up**

It was used to measure the strength of the upper body by implementing it for 1 minute. The calculated score is how many pushup moves are performed.

The data analysis was conducted using quantitative approaches. The normality test was conducted by Kolmogorov Smirnov. The data were analyzed by descriptive analysis and independent t-tests. Furthermore, the data were categorized into 5 categories based on the quartile's method.

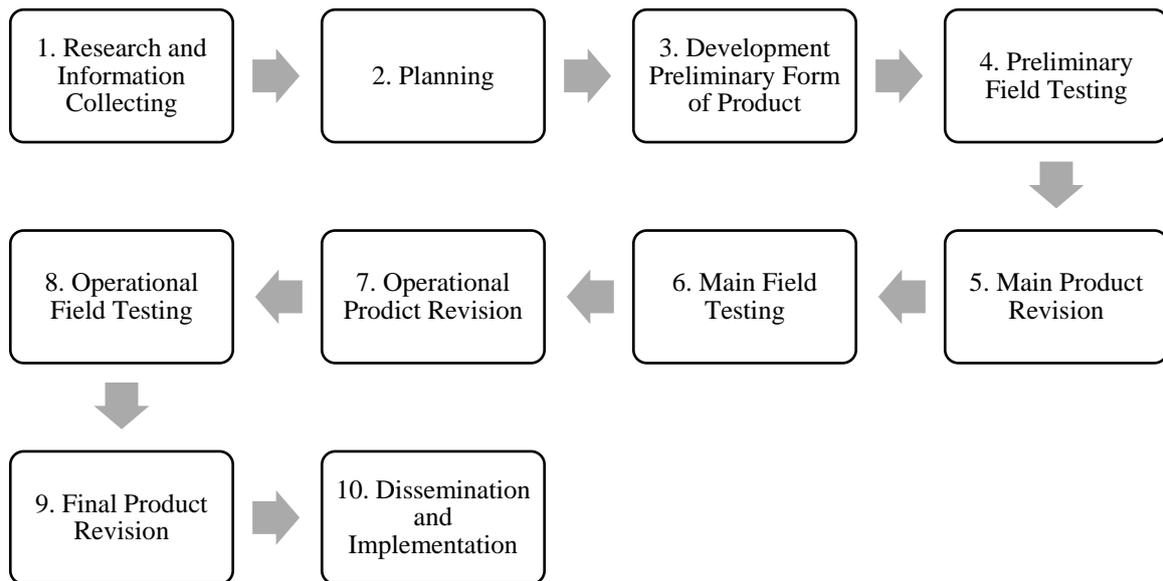


Figure 1. The Procedure of Research and Development

Results

Descriptive and Normality Test

Based on the data analysis of Kolmogorov Smirnov, the data were not in the normal distribution (sig. < 0.05). Furthermore, a non-parametric test was conducted to identify the significant differences between the male and female groups (see Table 1 and Table 2).

Table 1. The Data Test of Male Students

Variables	Mean	SD	Sig Value
Push Up	27.89	9.59	0.000
Plank	94.93	47.85	0.000
Horizontal Jump	177.40	48.45	0.200
Skipping	81.43	34.99	0.001

Table 2. The Data Test of Female Students

Variables	Mean	SD	Sig Value
Push Up	23.90	6.95	0.001
Plank	60.89	32.71	0.000
Horizontal Jump	118.47	32.45	0.000
Skipping	56.78	25.04	0.000

Mann-Whitney Test

According to Table 3, the mean value for male students in the push-up variable is 27.89, while the mean value for female students is 23.90.

Table 3. The Comparative Test Male and Female

Variables	Mean Rank (Male)	Mean Rank (Female)	Z Score	Sig Value
Push Up	27.89	23.90	-3.228	0.001
Plank	94.93	60.89	-7.290	0.000
Horizontal Jump	177.40	118.47	-11.534	0.000
Skipping	81.43	56.78	-6.531	0.000

In the plank variable, the mean value for males is 94.93, while for females it is 60.89. For the horizontal jump variable, the mean value for males is 177.40, whereas for females it is 118.47. Finally, in the skipping variable, the mean value for males is 81.43, while for females it is 56.78. Based on the results of the Mann-Whitney test, there is significant difference between male and female students in all variables ($p < 0.05$). Overall, male students have obtained higher average ranks compared to their female peers in all variables.

Norms of Physical Fitness Test

The norms of each item test were developed by using quartile methods. There are five categories for every item i.e., very high, high, medium, low, and very low. Based on the result of the Mann-Whitney test, the male and female norms were established inversely. Furthermore, the male norm of each test item is higher than female. There are four item test norms (see Table 4, 5, 6, and 7).

Table 4. The Norm of Push Up

Categories	Male	Female
Very High	> 43	> 35
High	33 – 42	28 – 34
Medium	25 – 32	21 – 27
Low	15 – 23	14 – 20
Very Low	< 14	< 13

Table 5. The Norm of Plank

Categories	Male	Female
Very High	> 167	> 111
High	119 – 166	76 – 110
Medium	72 – 118	46 – 77
Low	24 – 71	13 – 45
Very Low	< 23	< 12

Table 6. The Norm of Horizontal Jump

Categories	Male	Female
Very High	> 251	> 168
High	181 – 250	139 – 167
Medium	154 – 180	103 – 138
Low	105 – 153	71 – 102
Very Low	< 105	< 70

Table 7. The Norm of Skipping

Categories	Male	Female
Very High	> 135	> 95
High	100 – 134	70 – 94
Medium	65 – 99	45 – 69
Low	29 – 64	20 – 44
Very Low	< 30	< 19

Discussion

The COVID-19 pandemic has brought about significant disruptions to various aspects of life, including physical fitness and sports activities. The implementation of nationwide lockdowns, quarantines, and social distancing measures has led to a substantial impact on individuals' ability to engage in regular physical activity and maintain their physical fitness levels. The findings of this study shed light on the adaptations made by college students to continue their physical fitness routines amidst the challenges posed by the pandemic.

The study examined the impact of the pandemic on the physical fitness of college students and explored their adaptive behaviors. The results revealed that the pandemic had a significant effect on physical fitness, with limitations on traditional forms of exercise such as gym workouts, team sports, and outdoor activities. However, college students showcased resilience and adaptability by incorporating alternative methods of physical activity into their routines. One notable trend observed was the shift towards cardio sports and aerobic activities performed at home. This preference for home-based workouts indicates the importance of accessible and convenient exercise options during times of restricted movement. Virtual sports and recreational activities gained popularity as

individuals sought to maintain their physical fitness, derive entertainment value, and engage in social interaction within the confines of their homes. These findings align with previous research highlighting the surge in interest and participation in virtual sports during the pandemic (Bennet et al., 2021; Mehta, Saxena & Purohit, 2020; Shamshiripour et al., 2020).

The study also identified the components of physical fitness that were prioritized by college students during the pandemic. Factors such as muscle strength, flexibility, and cardiovascular endurance emerged as crucial elements that students focused on in their exercise routines. These findings align with the existing literature on physical fitness components (Ke & Wagner, 2022) and (Doherty, Millar & Misener 2022) emphasizing the importance of a well-rounded approach to physical fitness that addresses various aspects of strength, flexibility, and endurance. Furthermore, the study revealed gender differences in physical fitness levels among college students. Male students exhibited higher levels of performance and achieved higher ranks in all tested variables compared to their female counterparts. This finding is consistent with previous research highlighting gender disparities in physical fitness (Woods et al., 2020; Plasqui & Westerterp, 2006; George, Stone, & Burkett, 1997) However, it is important to note that individual variations within each gender group may exist, and additional factors such as individual training history and genetic factors could influence the results.

The development of a Personal Physical Fitness Test (PPPT) procedure and norm specific to the pandemic context was a key aspect of this study. The PPPT incorporated four test components: skipping, horizontal jump, plank, and push-up. These components were chosen to assess various aspects of physical fitness, including coordination, lower body strength, core muscle strength, and upper body strength. The norms for each test item were established using quartile methods, providing categories ranging from very high to very low. These norms serve as a benchmark to evaluate an individual's physical fitness level in the pandemic context (Ke & Wagner, 2020; Keshkar et al., 2021).

The norm of each test item provides a classification of Personal Physical Fitness Test (PPPT). It is beneficial in the education evaluation process. Besides, it could be an alternative for physical fitness test instruments which could measure the physical fitness level. The benefits of physical fitness are very diverse, one of which is that fitness for students and students can increase their willingness and ability to learn. A better physical fitness level would allow the student to enjoy participation in physical education and sports (Mustakim & Surury, 2020). Physical fitness appears as a modifier factor in a person, through physical activity and this modification can affect the quality of life of a person (Perez-Cruzado et al., 2018).

Physical fitness refers to an individual's performance in factors such as cardiovascular endurance, muscular strength, flexibility, and body composition. Research has shown that physical fitness has a positive impact on cognitive functions. In other words, physical fitness developed through regular physical activity can enhance cognitive abilities such as memory, attention, problem-solving skills, and mental flexibility (Cattuzzo et al., 2016; Sampaio et al., 2020). The physical activity level and motor development of children are also associated with physical fitness. When children engage in regular physical activity, they strengthen their muscles, improve coordination, and enhance motor skills. This helps children to participate more effectively in sports, games, and

daily life activities (Brusseau et al., 2016; Bürgi et al., 2020).

Children with higher levels of physical fitness tend to have greater endurance. Having better cardiovascular endurance and muscular strength enables children to tire less and have more energy during prolonged activities. This allows them to engage in physical exercise for longer periods, participate more actively in sports, and sustain daily life activities more effectively (Woods et al., 2020; George, Stone, & Burkett, 1997). Physical fitness also plays an important role in reducing the risk of cardiovascular diseases. Regular physical activity and adequate levels of physical fitness can help lower blood pressure, regulate cholesterol levels, and generally maintain cardiovascular health. This reduces the risk of heart disease, hypertension, and other cardiovascular disorders. Lastly, the health benefits of physical activity are related to the amount of activity performed. The more physical activity you engage in, the greater the health benefits. Therefore, it is important to engage in at least 30 minutes of moderate-intensity physical activity daily for overall health and physical fitness. Engaging in more intense physical activities alongside regular exercise can provide even greater health advantages (Aaltonen et al., 2015; Stodden et al., 2008; Mustakim & Surury, 2020).

The results of this study have important implications for promoting and maintaining physical fitness during the COVID-19 pandemic. The results suggest that individuals, particularly college students, can adapt their exercise routines and incorporate alternative methods of physical activity to maintain their physical fitness levels. The emphasis on home-based workouts, virtual sports, and recreational activities highlights the need for accessible and convenient options that cater to individuals' preferences and limitations during pandemic situations. Fitness professionals, educators, and policymakers can use these insights to develop and promote resources that support physical fitness and well-being during challenging times. The findings of this study emphasize the importance of health education during the COVID-19 pandemic and highlight the significance of physical fitness courses among university students. Our results demonstrate that health education serves as an effective tool in enhancing students' health consciousness. The implementation of physical fitness courses encourages students to develop regular exercise habits, while the utilization of the Personal Physical Fitness Test (PPFT) assists in objectively assessing individual fitness levels. These findings suggest that universities can contribute to students' adoption of healthy lifestyles and the preservation of their overall health by enhancing health education programs and implementing physical fitness tests, particularly during the COVID-19 pandemic.

Conclusion

In conclusion, the COVID-19 pandemic has presented significant challenges to maintaining physical fitness, with restrictions on traditional exercise avenues. However, college students have demonstrated adaptability by embracing alternative methods of physical activity and incorporating them into their routines. The preference for home-based workouts, virtual sports, and recreational activities reflects the need for accessible and convenient exercise options during the pandemic. Gender differences in physical fitness levels were observed, with male students generally achieving higher performance ranks compared to their female counterparts. The development of the Personal Physical Fitness Test (PPPT) procedure and norms specific to the pandemic context provides a practical tool for evaluating and improving physical fitness during these challenging times.

Implications

The findings of this study have several implications for various stakeholders:

- The results highlight the importance of promoting alternative exercise options, home-based workouts, and virtual sports to maintain physical fitness during times of restricted movement. Healthcare professionals and educators can provide guidance and resources to individuals, emphasizing the significance of a well-rounded approach to physical fitness that addresses various components.
- The study findings suggest the need for fitness professionals and trainers to develop innovative and adaptable exercise programs that cater to individuals' preferences and limitations during the pandemic. They can leverage technology and virtual platforms to provide guidance, motivation, and support to individuals seeking to maintain or improve their physical fitness levels.
- Policymakers can utilize the insights from this study to inform public health strategies and interventions aimed at promoting physical fitness during pandemic situations. The findings emphasize the importance of accessible and convenient exercise options and the need to provide resources that cater to individuals' preferences and limitations.
- The study provides valuable insights into the physical fitness behaviors and needs of college students during the pandemic. College and university administrators can use these findings to develop and enhance resources, facilities, and support systems that promote physical fitness and well-being among their student population.
- The study findings encourage individuals to embrace alternative methods of physical activity and exercise, such as home-based workouts, virtual sports, and recreational activities, to maintain their physical fitness levels during the pandemic. It highlights the importance of adapting to new circumstances and seeking accessible and convenient options to prioritize one's health and well-being.
- Overall, this study contributes to the understanding of maintaining and improving physical fitness during a pandemic. By exploring the adaptations made by college students and developing an adaptable fitness test procedure, it offers valuable insights and practical tools to promote physical fitness and well-being during challenging times.

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Author Information

Advendi Kristiyandaru

 <https://orcid.org/0000-0003-0085-6063>
Universitas Negeri Surabaya
Jl. Lidah Wetan, Lidah Wetan, Kec. Lakarsantri,
Surabaya, Jawa Timur 60213
Indonesia
Contact e-mail: advendikristiyandaru@unesa.ac.id

Muchamad Arif Al Ardha

 <https://orcid.org/0000-0002-9192-2072>
Universitas Negeri Surabaya
Jl. Lidah Wetan, Lidah Wetan, Kec. Lakarsantri,
Surabaya, Jawa Timur 60213
Indonesia

Kolektus Oky Ristanto

 <https://orcid.org/0000-0002-7525-9629>
Universitas Negeri Surabaya
Jl. Lidah Wetan, Lidah Wetan, Kec. Lakarsantri,
Surabaya, Jawa Timur 60213
Indonesia

Lutfi Nur

 <https://orcid.org/0000-0003-1944-8510>
Universitas Negeri Surabaya
Jl. Dr. Setiabudi No.229, Isola, Kec. Sukasari, Kota
Bandung, Jawa Barat 40154
Indonesia