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Special Recommendations for Home-Based Physical Training: Impact of Sedentary Due to Stay at Home Covid-19 Pandemic on Physical Fitness

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The purpose of this study was to examine the impact of sedentary stay at home due to the covid-19 pandemic on physical fitness and to examine the effects of home-based physical activity on physical fitness levels during the covid-19 crisis in Indonesia. This study used a mixed method sequential exploration design consisting of a quantitative stage and a qualitative stage. The sample used was 228 children and adolescents aged 5-17 years, n = 143 adults and elderly > 17, n = 85 people, participated in this study voluntarily. Sampling was carried out for the experimental group at random (n: 143) and the control group (n: 85). The experimental group engaged in 8 weeks of home-based physical activity delivered in person and via WhatsApp groups. Data were collected through the Indonesian Physical Fitness Test and semi-structured interview questions. Data analysis using a two-way mixed ANOVA was used to determine the effect of home-based physical activity carried out for 8 weeks with a duration of 3 times/week on the participants' physical health. Results: preliminary data descriptively show the level of physical health during the stay at home Covid-19 pandemic is in the poor category. After being given a form of home-based physical activity either directly or through a WhatsApp group, a significant increase was observed in the level of physical activity of children and adolescents 5-17 years, adults and elderly > 17 years in the experimental group compared to the control group. Conclusion: The results provide evidence that home-based physical activity with a duration of 15 – 30 minutes, has a positive effect on physical fitness levels during the covid-19.

Keywords: covid-19, mixed-method, physical fitness, sedentary, physical training

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INTRODUCTION

The COVID-19 pandemic, caused by infection with the novel human coronavirus, has been reported since December 2019 in China but was only formalized in March 2020. Since then, it has had an impact worldwide, both due to its aggressiveness and rapid propagation (Pinho et al., 2020). The novel coronavirus disease 2019 (COVID-19) has had a major impact on physical activity behavior globally (Hammami et al., 2020). Self-isolation at home intended to control the spread of the COVID-19 pandemic which has restricted movement, activity (Greenwood-Hickman et al., 2020). Self-isolation or termed stay at home at this time, will have an impact on sedentaries in various levels of society who apply these regulations. Life in quarantine can pose challenges to both physical and mental fitness. As a result, not a few of them have low health risks (Jurak et al., 2020).

During the COVID-19 pandemic, it resulted in a decrease in the level of physical activity, which has the potential to decrease physical fitness (Sunda et al., 2021). Staying at home contributes to a sense of social isolation and physical inactivity (Stanford & Salles, 2021). This isolation period has brought several changes to a person's life and habits, such as eating, sleeping, without being exposed to the sun, and doing physical activity (Silva et al., 2020), whereas regular physical activity is a safe and effective therapy to improve health. physical fitness (Thompson et al., 2021). What we know as a sedentary lifestyle or a sedentary lifestyle is a lifestyle that leads to low physical activity. There are two things that make a sedentary lifestyle an unhealthy lifestyle, namely not being active and consuming an unhealthy diet. A clear understanding of lifestyle during the COVID-19 pandemic, has become an important issue for the promotion of physical activity and health-related outcomes such as physical fitness, which relates to health, cognition, quality of life, and well-being (Chen et al., 2020; Ueafuea). et al., 2021).

We present a home-based exercise promotion that can be used for sedentary people that can be done during the current pandemic (Marck et al., 2021). The average physical fitness of inactive people is in the poor category, which is called sedentary behavior that disproportionately affects physical fitness (Stratton et al., 2020; Nct, 2020; NCT04400279, 2020), so specific recommendations can be given for an active lifestyle exercising in the form of home-based physical training in maintaining physical fitness (Simões et al., 2020).

METHOD

Research design

This study uses a mixed sequential exploration method consisting of a quantitative stage and a qualitative stage (Creswell & Creswell, 2018). This research is a survey research. According to Cohen, Manion, and Morrison (2007) said that the survey is part of the descriptive which aims to find the position (status), phenomena (symptoms) and determine the similarity of status by comparing it with a predetermined standard.

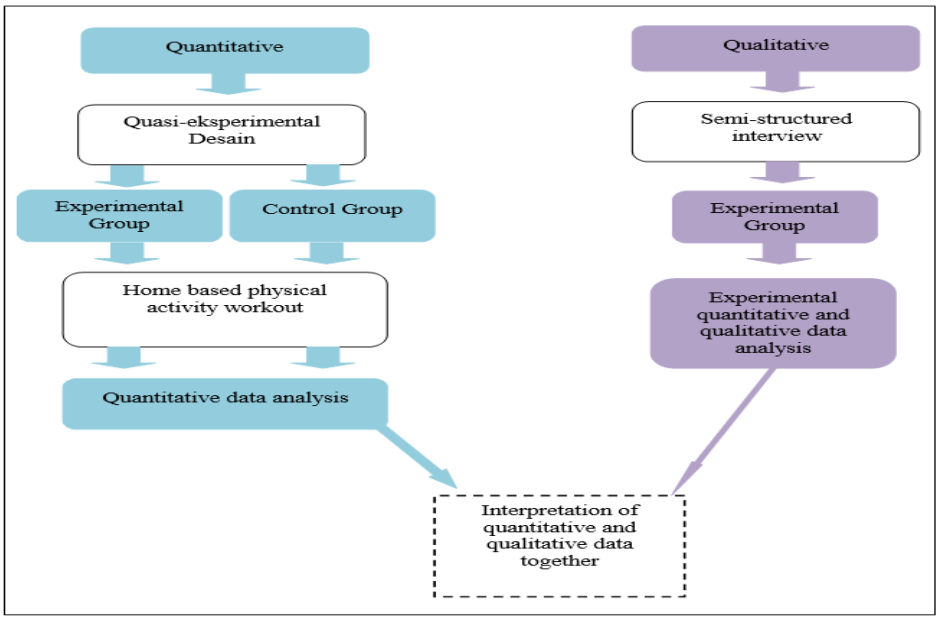

Figure 1
Research design

Participants

In this study, the sample used was 228 children and adolescents aged 5-17 years, n = 143 people, adults and the elderly > 17, n = 85 people, participated in this study voluntarily during the COVID-19 crisis see table 1.

Table 1
Sample characteristics

Description	Frequency	%
Gender		
Male	66	(28,9)
Female	162	(71,1)
Usia		
Children and adolescents 5-17 years old	143	(62,7)
Adults and seniors > 17 years old	85	(37,3)

All sample characteristics were tested with TKJI to describe the initial data of the test takers. Furthermore, the experimental and control groups were divided into giving treatment to the participants as the experimental class as many as 143 people with ages 5-17 years and >17 years. Home-based physical training activities can be seen in (table 2)

Table 2
Physical activity recommendations sent weekly (15 – 30 minutes in Three Times/Week).

Intensity	Physical activity	Content	Sedentary		Additional Intensity
			% Rmax	RPE (0–10)	
High	Home based physical activity	Exercises such as knees to elbows, back extensions, squats, and side knee lifts, who moves full body	60 (50-75%)	2 (1-3)	Moderate Breathing
Moderate			75 (70-85%)	3 (3-5)	Breathing increases, may be in a state of speaking but not singing
Low			50 (80-95%)	4 (4–8)	Breath deeply and fast, can speak a few words without stopping to breathe

Instruments

To verify the proposed hypothesis, a survey construct was developed from previously tested measures. First, measurement items related to the physical fitness of a person (Bui et al., 2019; Fiske et al., 2007). In this study, using the Indonesian Physical Fitness Test (TKJI) as an instrument in the study.

Procedures

The initial data collection strategy related to physical fitness tests was carried out directly to 4 regions in the province of West Sumatra in Indonesia, namely Bukit Tinggi City, Solok Regency, Pariaman City, and Pesisir Selatan Regency. After the initial data collection, a number of strategies were carried out to provide a dose of physical exercise that had been formulated in the form of home-based physical exercise. The strategy taken was first that the program that had been formulated was distributed directly to participants and controlled via WhatsApp Groups. The physical activity strategy will be monitored during the treatment. This, aims to ensure the continuity of physical activity and make participants ready to do physical activity for 8 weeks.

Data analysis

Data distribution was tested by Kolmogorov-Smirnov test. Variable statistics are reported briefly using the mean and standard deviation. The groups were compared by one-way analysis of variance (ANOVA) and to determine the source of the differences the Tukey HSD test was performed because the variances were homogeneous. NS independent sample t-test was used for the two-group comparisons. The significance level is taken as 0.05. Data were analyzed with the help of SPSS 25 Statistical Software. And for qualitative data using Miles and Huberman (reduction, display and conclusion) (Miles & Huberman, 1995).

FINDINGS AND DISCUSSION

Results

The sample of this study consisted of a total of two hundred and twenty eight people. The samples were randomly distributed to the experimental group and the control group (see Table 1 for the demographic characteristics of the participants). The results of the research descriptively and experimentally can be seen in Tables 3, 4, dan 5).

Table 3
Descriptive statistics (Mean and Standard Deviation) related to physical fitness due to stay at home Covid-19 pandemic by gender and age (U= 5 -17; U= >17 years)

Focus	*N*	*M ± SD*	*Score "TKJI"*	Category
Gender				
Male				
Lari Cepat (30 -50 m)	66	2,742 ± 1,232		
Gantung Siku tekuk/Gantung (60 menit)	66	3,015 ± 1,514		
Baring Duduk (30 - 60 deti)	66	3,167 ± 0,938	13	Not enough
Loncat Tegak	66	2,561 ± 0,994		
Lari Sedang 600 - 1000 m)	66	1,848 ± 1,304		
Female				
Run fast (30 - 60 m)	162	2,006 ± 1,161		
Hang Elbow Bend	162	2,444 ± 1,780		
Lying Sitting (30 - 60 deti)	162	2,988 ± 0,659	12	Not enough
Jump Upright	162	2,068 ± 0,985		
Medium Run (600 - 1200M)	162	1,994 ± 1,258		
Age				
Children and youth 5-17 years old				
Run fast (30 - 60 m)	143	2,713 ± 1,173		
Hang Elbow Bend	143	2,154 ± 1,517		
Lying Sitting (30 - 60 deti)	143	3,091 ± 0,804	12	Not enough
Jump Upright	143	2,357 ± 0,859		
Medium Run (600 - 1200M)	143	2,084 ± 1,361		
Adults and seniors > 17 years old				
Run fast (30 - 60 m)	85	1,338 ± 0,788		
Hang Elbow Bend	85	3,376 ± 1,786		
Lying Sitting (30 - 60 deti)	85	2,953 ± 0,653	11	Not enough
Jump Upright	85	1,965 ± 1,190		
Medium Run (600 - 1200M)	85	1,729 ± 1,073		

The results of the physical fitness test that the researchers got from December 2020 to February 2021, illustrates that the physical fitness of the Indonesian people in the province of West Sumatra during the Covid-19 pandemic was in the poor category. Judging from the average freshness of the age based on the level of gender and age, namely: (1) gender; (a) male; have an average ability to Run Fast (30 -50 m) = 2,742, Hang Elbow bent/Hang (60 minutes) = 3,015, Lie Sitting (30 - 60 sec) = 3,167, Jump Upright = 2,561, Medium Run 600 - 1000 m) = 1.848. (b) women; has an average ability to Run Fast (30 -50 m) = 2.00, Hang Elbow bent = 2.444, Lie Sitting (30 - 60

sec) = 2.988, Jump Upright = 2.068, Medium Run 600 - 1000 m) = 1.994. (2) Age; (a) children and youth (5-17 years); have an average ability to Run Fast (30 -50 m) = 2,713, Hang Elbow bent/Hang (60 minutes) = 2,154, Lie Sitting (30 - 60 sec) = 3,091, Jump Upright = 2,357, Medium Run 600 - 1000 m) = 2,084 (b) adults and elderly (> 17 years); have an average ability to Run Fast (30 -50 m) = 1,338, Hang Elbow bent/Hang (60 minutes) = 3,376, Lie Sitting (30 - 60 sec) = 2,953, Jump Upright = 1,965, Medium Run 600 - 1000 m) = 1,729. Based on the average of each test indicator based on (1) gender; male test takers have a level of physical fitness at a value of 13 with the classification "Less", female test participants have a level of physical fitness at a value of 12 with a classification "Less". (2) Age; children and adolescents (5-17 years), the average physical fitness is at a value of 12, with the classification "Less". (b) adults and the elderly (> 17 years), the average physical fitness is at a value of 11, with the classification "Less". Based on the data above, it can be temporarily interpreted that the 216 samples whose physical fitness tests were carried out while staying at home due to the Covid-19 pandemic, were classified as lacking.

Table 4
Significance of the difference in the average data for the control and experimental group "TKJI" variable based on age (U= 5 -17; U= >17 years)

Category	Focus	Control Group Mean±SD (n =85)	Experimental Group Mean±SD (n = 143)	t	p-velue	Score "TKJI"	Category
Children and youth U 5-17 (M/F)	Lari Cepat (30 - 50 m)	2,713 ± 1,173	4,028 ± 0,731	11,600	,000	18	Good (Eksperimen)
	Gantung Siku tekuk/Gantung	2,154 ± 1,517	3,867 ± 0,890	13,455	,000		
	Baring Duduk (30 - 60 deti)	3,091 ± 0,804	3,804 ± 0,653	8,552	,000		
	Loncat Tegak	2,357 ± 0,859	3,629 ± 0,458	16,134	,000		
	Lari Sedang 600 - 1000 m)	2,084 ± 1,361	3,189 ± 0,393	9,969	,000		
Adults and old age U > 17 (M/F)	Lari Cepat (30 - 60 m)	1,338 ± 0,788	3,612 ± 0,692	17,241	,000	16	Enough (Control)
	Gantung Siku tekuk/Gantung	3,376 ± 1,786	3,353 ± 0,667	2,625	,010		
	Baring Duduk (30 - 60 deti)	2,953 ± 0,653	3,482 ± 0,648	5,302	,000		
	Loncat Tegak	1,965 ± 1,190	3,729 ± 0,605	13,539	,000		
	Lari Sedang (600 - 1200M)	1,729 ± 1,073	3,176 ± 0,560	10,225	,000		

The final measurement data in Table 3 shows that the univariate analysis of difference (ANOVA) based on a coefficient of influence -t and the value of the statistical significance of the p-value proves that between the control and experimental groups there is a statistical difference of p= 0.000.

Table 5
Paired sample t-test results related to home-based physical activity pre-test-posttest scores.

Groop		N	M	SD	t	*P*
Experimental group	Pre-test	143	12,399	3,138	19,292	,000**
	Pots-test	143	17,783	2,274		
Control group	Pre-test	85	1,412	1,400	0,199	,843NS
	Pots-test	85	2,855	2,752		

The results (Table 7) show the difference in SD of the experimental group and the control group. The mean of control n = 85 = 1.412 and experimental n = 143 = 17.783. This difference can be seen from the value of p = 0.000 for the experimental group, and p = 0.843ns for the control group.

The following findings were obtained from interviews with participants about the benefits of home-based physical exercise. Overall, we summarize the participants' statements stating that home-based physical exercise can improve their physical fitness and contribute to mobility in motion that is not easily tired. In addition, respondents also demanded that the formulated programs and videos be used as tools to support maintaining health not only during the outbreak period, but also during normal times.

DISCUSSION

The findings from this study are that a person's level of physical fitness during the COVID-19 crisis is in the less category. This is due to lack of movement due to staying at home. With recommendations for home-based physical exercises that have been formulated in the form of books equipped with pictures and video tutorials that we distribute in the WhatsApp group, the participants have a positive effect on improving the quality of physical fitness for children and adolescents aged 5-17 years as well as adults and the elderly. > 17 years. After the physical activity delivered via WhatsApp, it was determined that the participants in the experiment experienced a significant increase in physical activity level compared to the control group.

Maintaining physical activity at home is associated with increased functional performance of the heart and lungs during the COVID-19 pandemic can describe a person's physical fitness (Ma et al., 2020).

CONCLUSION

In this study, strategic information regarding home-based physical activity was shared with test takers by interacting directly and indirectly every day and every week through WhatsApp groups. Participants' questions regarding the activity were answered directly through the WhatsApp group, and it was ensured that participants carried out physical activity sessions with joint discussions and involving parents for child participants.

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