

# Barriers to health protocol adherence during exercise among youth in the COVID-19 pandemic era

Fitrawan Silvano,<sup>1</sup> Amila Yashifa,<sup>1</sup> Daniel Simada Pandapotan Saragih,<sup>1</sup> Claudia Gunawan,<sup>1</sup> Anindyaningtias Inas Wuragil,<sup>1</sup> Resa Paksi Mandariska,<sup>1</sup> Supriyati<sup>2,\*</sup>

<sup>1</sup>Undergraduate Program of Medicine, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Yogyakarta, Indonesia

<sup>2</sup>Department of Health Behavior, Environmental, and Social Medicine, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Yogyakarta, Indonesia

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## KEYWORDS

COVID-19  
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**ABSTRACT** Physical inactivity is one of the non-communicable disease risk factors. This study discusses how the Coronavirus Disease-2019 (COVID-19) has increased the leisure time, including among youth. The health promotion to improve the physical activities of youth is needed. This study aimed to analyze the level of compliance among Indonesian people particularly the young adults towards health protocol during exercise and conduct an intervention accordingly. This study used an action research design, with consecutive sampling. Respondents were Indonesian youth who exercise outside of their home during the COVID-19 pandemic. A total of 361 Indonesia youth aged 18-25 years old, who exercise during the pandemic inside and/or outside the home, and willing to answer the questionnaire completed the online questionnaire. The questionnaire was developed from the six health protocols' criteria from the Ministry of Health of the Republic of Indonesia. Data analysis used chi squared tests. Furthermore, a short video was developed according to the main research findings and published on Instagram TV as a health intervention to the respondents. The results showed that the level of compliance among Indonesian youth toward health protocol during exercise was low (24.1%). Moreover, only 35.3% respondents applied physical distancing and 48.7% respondents wore masks during at low-moderate intensity exercise. There was no significant association between gender, exercise intensity, and perception of the health protocol and the compliance of health protocol during exercise. In addition, the audience response toward video campaign about health protocol during exercise was good with more than 1,000 views, 166 likes and 50 comments. This study concluded that health promotion media that were developed based on the needs assessment results were effective to reach the target audiences.

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## 1. Introduction

The Coronavirus Disease-2019 (COVID-19) pandemic which has spread across Indonesia since February 2020 has caused most people to do nearly all activities at home, leading to a decreased frequency of physical activity. The time spent for only sitting and resting is known to be increased more than the usual.

In comparison with sedentary lifestyle, routine exercise and physical activity are beneficial in preventing various diseases, particularly the non-communicable diseases such as obesity, diabetes

mellitus, coronary heart disease, and they also help in reducing stress and preventing depression.<sup>1</sup> Exercise is also fundamentally important during the COVID-19 pandemic. Exercise that is done routinely for 2-3 times per week, in the duration of 15-30 minutes can maintain immunity and prevent depression which can aid in preventing further complications of COVID-19 disease.<sup>2</sup>

The Indonesian government has issued a physical distancing policy aimed at people who engage in any activities outside the home. According to the Ministry of Health of Indonesia, physical distancing while exercising has the same objective with any outside of the home activities in general, which is to reduce contact between individuals thus stopping or slowing the rate of disease transmission, including

\*Correspondence: [Supriyati@ugm.ac.id](mailto:Supriyati@ugm.ac.id)

Department of Health Behavior, Environmental, and Social Medicine, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Jl. Farmako, Sekip Utara, Yogyakarta 55281, Indonesia

COVID-19. The government policy in Indonesia related to health protocols in sports or exercise has also been explicitly regulated in *Kepmenkes* RI No. HK.01.07/Menkes/382/2020, in line with the recommendations of the Indonesian Sports Medicine Specialist Association or *Persatuan Dokter Spesialis Kedokteran Olahraga* (PDSKO), stating that people who are doing exercise or sports outside the home or users of a fitness and/or sport center facilities are required to actively wash their hands, apply physical distancing, and continue to use face masks when performing low to moderate intensity exercise.<sup>3-8</sup>

One study demonstrated the usefulness of social media in transferring resource materials and collaborative learning, hence increasing the enthusiasm and dynamicity of the learning process.<sup>9</sup> Another study also provided an overview of current trends regarding how technology is affecting higher education, as the increased use of video as a teaching media is occurring in higher education and affects the lecturers, students, and universities as a whole.<sup>10</sup> Hence, developing health promotion media that can potentially be delivered through social media is important to develop as the health promotion interventions targeted to adult youth.

Therefore, this study aimed to analyze the level of Indonesia young adults' compliance towards health protocols during exercising outside of home and conduct health promotion media as the intervention.

## 2. Method

### 2.1 Study design, sample selection, and data collection

This study used an action research design, comprising the steps: 1) identify problem, 2) make an outline of action plan, 3) carry out action plan, 4) observe how plan works out, and 5) reflect upon situation. Respondents were Indonesian young adults who exercise during the COVID-19 pandemic and fulfill the inclusion criteria. The sampling method was consecutive sampling, with the following inclusion criteria: 1) aged 18-25 years; 2) Doing sports outside the home; 3) Willing to become a respondent by completing an online questionnaire by a specified deadline. There were no exclusion criteria applied in

this study. This study used all samples who fulfilled the inclusion criteria. Data collection was done through an online questionnaire that was opened for the public with a duration of 4 days and distributed via social media platforms such as Instagram, LINE messaging application, and WhatsApp messaging application. Respondents were enrolled voluntarily, as optimally as possible from the authors' colleague network. The questionnaire was developed by the researchers based on the six health protocol criteria from the Ministry of Health of the Republic of Indonesia. There were 11 questions about perceptions of the health protocol during exercise outside the home, and the compliance towards health protocol during exercise outside. Additionally, this study considered gender as one of the independent variables.

### 2.2 Data analysis and ethical consideration

The descriptive and associational analysis were done in this study. Respondents who fulfilled the criteria were then divided into two groups, compliant and non-compliant, based on the fulfillment of health protocol criteria from the Ministry of Health Indonesia. Uni-variate analysis was used to describe each variable such as gender, location of exercise, type of exercise, duration of exercise, intensity of exercise, wearing masks, doing physical distancing, 6-step hand washing, sharing of exercise equipment, and adherence to the official Health protocols. Bivariate analysis used chi-squared tests to identify the association between the respondents' perception on health protocol (classified into good and bad perceptions), gender (classified into male and female), and intensity of exercise (classified into low-moderate and high) towards the compliance of health protocol during exercise outside the house in the pandemic era (classified into compliant and non-compliant). This study was approved by the Medical and Health Research Ethic Committee of the Faculty of Medicine, Public Health, and Nursing UGM (Ref. no. KE/FK/0902/EC/2020).

### 2.3 Video campaign as an action

Since this study used an action research design, an intervention was developed after the data analysis and discussion. The video campaign was developed by the researcher team according to the results of

the survey and was focused on the importance of physical activities during the COVID-19 pandemic and the importance of physical distancing along with the physical activities. Those messages were chosen because the survey results showed they were the biggest problems related to the health protocol adherence during exercise among youth. There were 2 videos created, with 1.5 minutes duration for each video. Furthermore, both of the videos' interactive campaign was published through Instagram TV (social media). The videos were published to the targeted audiences by using the research team's Instagram accounts for a set period of time.

### 3. Result

#### 3.1 Respondents characteristics

A total of 416 people completed the online survey, but as many as 55 respondents did not meet the inclusion criteria. Therefore, the final research respondents were 361 young adults. The respondents' characteristics are shown in the following Table 1.

The majority of the respondents were female (60.7%), and most of them live on the island of Java (81.5%). Most respondents were 23 years old (35.5%). Even though the questionnaire had been targeted specifically for people who exercise outside the home, one third of subjects tended to exercise inside the house (38%), while the rest tended to exercise outside the house. Data about exercising at home were only displayed in the characteristics of respondents and no further analysis was performed.

#### 3.2 The level of compliance with health protocol during exercise

This study showed that the level of compliance among Indonesian young adults toward health protocol during exercise was low (24.1%). Respondents who exercised outside the house were included in the analysis of exercise intensity and compliance to health protocol. Percentages of respondents' responses on each criteria of health protocol during exercise are shown in Table 2.

Most of the respondents did the low to moderate intensity exercise (70.5%). Fit physical condition

**Table 1.** Respondents Characteristics

Variable	n	%
Gender		
Male	142	39.3
Female	219	60.7
Age		
18 years old	7	3.1
19 years old	7	3.1
20 years old	8	3.6
21 years old	26	11.6
22 years old	55	24.6
23 years old	79	35.5
24 years old	28	12.5
25 years old	14	6.3
Region		
Java	294	81.5
Outside Java	67	18.5
Exercise location		
Inside house	137	38
Inside and outside house	108	29.9
Outside house-indoor	27	7.5
Outside house-outdoor	89	24.7

assurance was high, around 98.2% confirmed they were in fit condition before exercising outside the house. In addition, most of them (81.7%) did not share exercise equipment. The compliance to the WHO 6 steps for hand hygiene before and after exercise was excellent (87.1%). Moreover, most of respondents (92.4%) took a shower and changed clothes after exercising outside the house. On the other hand, compliance to mask-wearing was not satisfying. There were only (48.7%) wearing a mask during low to moderate-intensity exercise. Also, 12.1% wore a mask and 17.4% did not wear a mask at high-intensity exercise. The assessment of the type of exercise and physical distancing practice showed that there were only 35.5% who did the physical distancing appropriately. Overall, only 24.1% followed all the 6 aspects of the health protocol during exercise outside the home as recommended by the Indonesian Ministry of Health.

#### 3.3 The association between gender, exercise intensity, perception on health protocol and compliance with health protocol during exercise

Several participants (n=3) dealt with the burden in their occupations and loss of income due to the COVID-19 pandemic. Their roles as heads of the family and the breadwinners provided a massive psychological impact. They complained that they

**Table 2.** Respondents' compliance with health protocol during exercise by criteria

Variable	n	%
Making sure you are in fit condition before exercising outside the house		
Yes	220	98.2
No	4	1.8
Not sharing equipment		
Yes	183	81.7
No	41	18.3
WHO 6 steps hand hygiene before and after exercise outside the house		
Yes	195	87.1
No	29	12.9
Wearing a mask during exercise outside the house		
Wearing a mask at low to moderate-intensity exercise	109	48.7
Wearing a mask at high-intensity exercise	27	12.1
Not wearing a mask at high-intensity exercise	39	17.4
Not wearing a mask at low to moderate-intensity exercise	49	21.9
Taking shower and changing cloth after exercising outside the house		
Yes	207	92.4
No	17	7.6
Physical distancing		
Indoor (gym)		
>2 meters	7	50
<2 meters	6	42.8
Unanswered	1	7.2
Walking		
>5 meters	12	37.5
<5 meters	19	59.4
Unanswered	1	3.1
Running/jogging		
>10 meters	44	51.1
<10 meters	40	46.5
Unanswered	2	2.4
Cycling		
>20 meters	16	6.4
<20 meters	27	61.4
Unanswered	1	2.2
Others	48	
Overall		
Yes	79	35.3
No	145	64.7

**Table 3.** Association between gender, exercise intensity, perception on health protocol and the compliance with health protocol during exercise

Independent Variable	Compliant		Non-Compliant		P	PR (95% CI)
	n	%	n	%		
Gender						
Male	25	46.3	90	52.9	0.436	0.766 (0.415-1.416)
Female	29	53.7	80	47.1		
Exercise intensity						
Low-moderate	36	66.7	122	71.8	0.496	0.787 (0.408-1.518)
High	18	33.3	48	28.2		
Perception of Health Protocol						
Good perception	51	94.4	147	86.5	0.145	2.660 (0.766-9.234)
Poor perception	3	5.6	23	13.5		



Figure 1. Screenshot of the video campaign

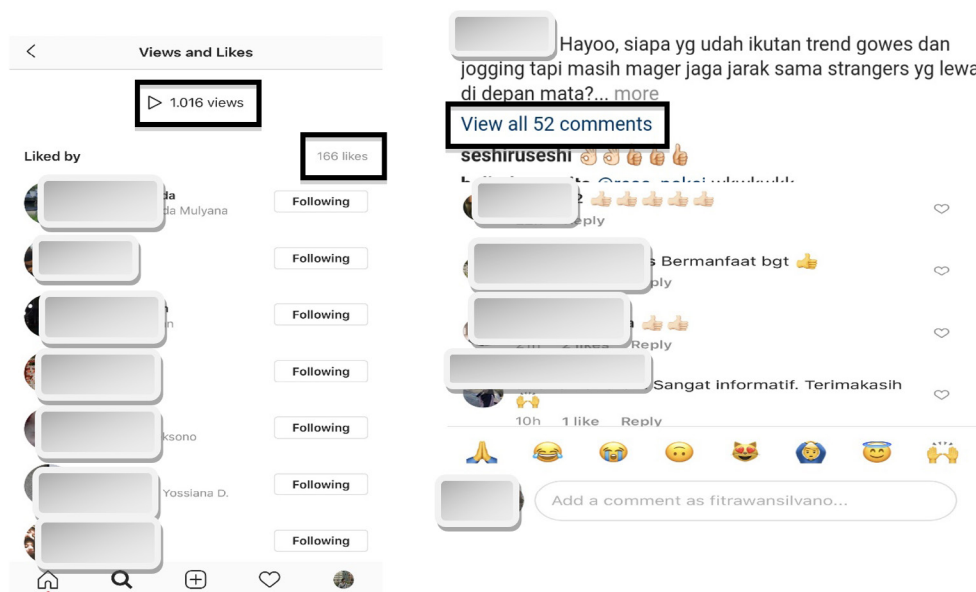


Figure 2. Number of video campaign’s viewers and likes, as well as example of audience comments

were laid off from work, causing financial problems to the family. Furthermore, the Indonesian economic crisis due to the pandemic resulted in an increase in inflation and higher prices of many household items and consumable goods.

**3.4 Response of Indonesian young adults on the video campaign**

This study showed that physical distancing (35.3%) with appropriate distance according to type of exercise (50% at the gym, 37.5% on walking,

51.1% on running, and 36.6% on cycling) and mask wearing at low-moderate intensity exercise (48.7%) were the two least complied criteria adhered to by respondents. Thus, an interactive video was created on the health protocol during exercise outside the home in the COVID-19 pandemic era to increase the young adults' awareness and aimed at highlighting those two criteria (Figure 1). The "Instagram TV" was chosen as the communication channel platform, due to its current popular trend among Indonesian young adults.

Within 24 hours after the video was first uploaded, the responses of the viewers in the form of likes and comments are shown in Figure 2. The video got 1,016 viewers, 166 likes, and 52 comments. Most of the comments were complimenting the video, such as "this video is easy to understand", "it is very informative", "the video motivates me to exercise again", "good video", "thumbs up" etc.

#### 4. Discussion

The level of Indonesian young adults' compliance toward health protocol (the 6 aspects of health protocol during exercise outside the home as recommended by the Indonesian Ministry of Health) was low (24.7%). There were only 48.7% who wore a mask at low to moderate-intensity exercise and only 35.5% did the physical distancing appropriately. There was also no significant association between gender, exercise intensity, perception on health protocol and the compliance with health protocol during exercise.

Based on the inclusion criteria from this study, the range of participants' age (18-25 year) relates to the respondent's exercise routine and the respondent's ability to consider and obey health protocols. People less than 20 years old are the most frequent participants doing sports regularly and this decreases dramatically after he/she became more than 20 years old.<sup>11</sup> The ability of respondents at this age to think complexly, see through various points of view, understand social values, and regulate emotions in a stable manner will also help in understanding health protocols.<sup>12</sup>

Although the government has provided various policies regarding health protocols in dealing with

the COVID-19, the incidence of the COVID-19 patients in Indonesia is still high, and this study showed that the level of young adults' compliance was low. A study explained that it was caused by cognitive biases, which are classified into several classifications, namely optimism bias, emotional bias, and the Dunning Kruger effect, the major bias for Indonesians. The last type of bias explains that Indonesians feel they know and understand how to deal with a pandemic better than the government. So, a more thorough knowledge and understanding about health protocols during pandemic is needed by the public.<sup>13</sup>

According to this study, women tended to be more obedient in implementing health protocols than men, although it was not statistically significant. This was supported by research which stated that women tended to be more obedient than men, even though the study also explained that the finding was not statistically significant.<sup>14</sup> Other studies also explained that there was greater tendency for men to break the rules.<sup>15</sup>

It was also found in this study that respondents who did low-moderate intensity exercise tended to obey health protocols better than respondents with high intensity exercise, even though it was not statistically significant. Doing exercise requires energy and muscle performance, while the use of masks causes obstruction of air flow to the respiratory tract, thereby increasing the perception of exertion, reducing muscle performance, and increasing lactate concentration when compared to training without mask. Therefore, the use of masks during exercise was often neglected.<sup>16</sup> High intensity training was also related with the "open window" theory. This theory explained that high intensity training induces suppression of the immune system. This window period may allow for an increase in susceptibility to upper respiratory illness, especially for the COVID-19. So, moderate intensity training is more recommended because it can improve the immune system.<sup>17</sup> In addition, the COVID-19 patient may be asymptomatic for several days and hence, high-intensity exercise may be more dangerous.

This study also explained that there was no significant association between the perceptions

on health protocols with participant compliance in implementing them. One study examining the relationship between high understanding and low level of compliance by using the application of the SSC (Surgical Safety Checklist) on medical personnel, explained that almost all medical personnel understood SSC, but only 57.2% of these medical staff carried out the complete SSC. So, the high level of understanding did not guarantee a high level of citizen compliance.<sup>18</sup>

In addition, the evaluation of the small health promotion intervention by using videos that were published through Instagram TV showed that the messages had reached the target audiences. Reach is one of the health promotion media evaluation components according to the RE-AIM (reach, effectiveness, adoption, implementation, and maintenance) framework. RE-AIM was developed as a formative evaluation program, including for the health promotion interventions.<sup>19</sup> Audiences who were targeted in this small health promotion intervention gave appreciation to the messages that were delivered, and forwarded the messages to their friends and colleagues. Even though the number of respondents were 361 young adults but the viewer count of the video was 1,016 viewers within 24 hours, and the messages got 166 likes and 52 comments within 24 hours. A video campaign was chosen as the intervention (action) in this study. An interactive video as the campaign media was more effective to increase participants' understanding when compared to paper-based media.<sup>10</sup> Besides, the messages were published to the audiences at the right time. This study was performed in August 2020 when the number of the COVID-19 patients in Indonesia were increasing after the 'new normal' regulations were applied. Most people tended to do the new normal behavior with the recommended safety principles. At that time, the information concerning how to do exercise outside with safety protection was needed.

Health promotion interventions should be designed according to the needs assessment results.<sup>20</sup> These results will help health promotion experts to design the appropriate program, key messages, as well as determine the specific target and time for delivering the health promotion messages. The video campaign in this study was designed according to the

survey results, i.e. the key messages, communication channels, and the media campaign.

This study had some limitations. First, the questionnaire was used without trial. This study could not provide the validity and reliability of the questionnaire. Secondly, the survey in this study was conducted online in a narrow time period.

## 5. Conclusion

The percentage of Indonesian young adults aged 18-25 years old who comply with all six criteria of the official health protocol during exercise outside the home in the COVID-19 pandemic era was low, especially for the physical distancing and mask wearing at low-moderate intensity exercise. There was no significant association between the perception on health protocol, gender, and intensity of exercise towards the compliance of health protocol during exercise in the COVID-19 pandemic era. The health promotion interventions that were designed according to the needs assessment results could reach the target audiences. Therefore, Instagram TV is an alternative communication channel for spreading health information targeted to youth during the COVID-19 pandemic.

## Conflict of interests

There is no potential conflict of interest with respect to the research, authorship, and/or publication of this article.

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