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Original Article

Psychosocial Distress among Teenage Girls within the Coronavirus Outbreak: The Role of Physical Activity and Sedentary Time

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Abstract

Background: The effects of the coronavirus outbreak on the psychological and physical wellbeing of teenage girls is not well understood. Herein, one of the important mental health-related variables is introduced to be psychosocial distress (PSD). The current research aimed to explore the status of PSD in teenage girls during the coronavirus outbreak considering the impact of physical activity (PA) and sedentary time (ST).

Methods: This research utilized a descriptive-correlation method. We selected 384 teenage girls (mean age 16.93±0.72 years) in Iran, in 2020, using a convenience sampling procedure. The participants were healthy and without any physical or mental disabilities. They completed the standard questionnaires including the COVID-19-Related Psychological Distress Scale, Physical Activity Behavior in Leisure-Time Scale, and Adolescent Sedentary Activity Questionnaire. Spearman correlation test and structural equation modelling were utilized for data analysis.

Results: Our findings revealed that the psychosocial status of adolescent girls during the coronavirus outbreak was 41.50 out of 70. The subjects who were more physically active had lower levels of PSD ($r=-0.627$, $P<0.001$, whereas those with higher ST reported higher scores in PSD status ($r=0.481$, $P<0.001$).

Conclusions: The results of the current research demonstrate that PSD and PA are significant challenges threatening the health of teenage girls during the coronavirus outbreak. Accordingly, it is essential to adopt appropriate procedures to enhance PA and reduce ST of teenage girls.

Keywords: Psychosocial distress, Physical activity, Sedentary, Coronavirus, Girls

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1. Introduction

COVID-19 is an irresistible respiratory malady derived from a modern coronavirus, which was primarily recognized in Wuhan (China), and has circumfused quickly around the world since early 2020 (1). This infection influenced millions of individuals and killed over six million of them worldwide. Due to the fast spread of the disease, most countries have passed restrictions and extreme limitations such as home-confinement, isolation and social confinement to avoid the community spread of the coronavirus (2). Such limitations, in turn, has led youngsters spend the majority of their time at home. Although quarantine reduced the spread of the virus and subsequent mortality in the community, it has created problems for children and adolescents; for example, home-schooling has constrained opportunity of physical activity at school and schedule communal contacts with counterparts (2, 3). Additionally, various studies indicated that social distancing has truly changed the level of physical activity (PA) and mental wellbeing of teenagers during this period (4-9). Moreover, it has been shown that the coronavirus quarantine increased psychosocial distress (PSD) among various populations (10-15). However, the impact of the coronavirus outbreak on PSD among teenagers have not been investigated. PSD is an emotional state or temperament characterized with depression, pity, uneasiness, self-destructive ideation, and self-consciousness. It has been appeared that personal, social, and cultural components, such as gender, diminished official education, as well as diminished economic condition, the need to public welfare, and unpleasant life conditions are related to PSD among youths (12, 13). Therefore, it can be assumed that a condition like the coronavirus outbreak, which has led to numerous stressful events (such as parents'

death, lacking enough socioeconomic support, and lacking social support can increase PSD among individuals. Hence, the first objective of the current study was to examine PSD status in teenage girls within the coronavirus outbreak.

Furthermore, important issues that might affect PSD are PA and sedentary time (ST). PA is characterized as any action of the body delivered by skeletal muscles, which results in energy use and is executed as a sportive activity, working exercises, dynamic transition, family exercises, or leisure exercises (16, 17). On the other hand, ST alludes to certain activities in a leaning back, situated, or lying position requiring very low energy consumption (16, 17). Numerous studies demonstrated that PA contributes to better cardiovascular structure and strength, powerful bones, memory activity, and cognition, as well as lessening depressive indications and obesity (18-21). Furthermore, it has been shown that ST can lead to negative physical and mental health-associated outcomes (18-21). Thus, PA and ST within the coronavirus outbreak might affect the level of PSD among teenage girls. The second purpose of the current research was therefore to examine whether the level of PA and ST could predict the level of PSD among teenage girls within the coronavirus outbreak. Overall, the present work aimed to 1) determine the level of PSD, PA, and ST among teenage girls within the coronavirus outbreak, and 2) whether the level of PA and ST could predict the level of PSD among teenage girls within the coronavirus outbreak.

2. Methods

In this research, we applied a descriptive-correlation design. The protocol was affirmed with code of IR.IAU.AK.REC.1400.001. Teenagers and their parents signed an informed consent.

2.1. Participants

384 teenage girls aged 16-18 years (average age of 16.93±0.72 years) from Golestan province, Iran, in 2021, voluntarily participated in this study. The current research was performed in Iran, in 2020. The participants were healthy and without any physical or mental disabilities. We used Cochran's Sample Size Formula (22) for calculating the sample size. In this equation, n equals the sample size, z equals 1.96 for a 95% confidence level (0.25 in each tail), P equals 0.05; q equals 1-P; d equals 0.05 (which was calculated by 0.1*P=0.05), and N is equal over 100000.

$$n = \frac{\frac{Z^2 pq}{d^2}}{1 + \frac{1}{N}\left(\frac{Z^2 pq}{d^2} - 1\right)} =$$

$$\frac{\frac{1.96^2 \times 0.5 \times 0.5}{0.05^2}}{1 + \frac{1}{100000}\left(\frac{1.96^2 \times 0.5 \times 0.5}{0.05^2} - 1\right)} =$$

$$\frac{384.16}{1.00038416} = 384.012 \approx 384$$

2.2. Measures

2.2.1. Psychosocial Distress: The COVID-19-Related Psychological Distress Scale (CORPD) was used for PSD measurement (23) among the teenage girls within the coronavirus outbreak. CORPD comprises 14 questions according to a five-point Likert-scale ranging from 1=totally disagree to 5=totally agree. Higher points represent higher levels of PSD. To evaluate the quantitative validity of the Persian version of this scale, we asked eight experts to evaluate all the items of the scale. Subsequently, we calculated item-level face validity index (I-FVI), Content Validity Index (CVI), and Content Validity Ratio (CVR). The results demonstrated that the Persian version of this scale has good quantitative validity (I-FVI=0.85, CVI=0.90, CVR=0.94). Additionally, Cronbach's alpha coefficient was 0.90.

2.2.2. Physical Activity: We used Physical Activity Behavior in Leisure-Time Scale (24) with three questions to evaluate the level of PA. The items consisted of a Likert scale ranging from zero days (0) to seven days (7). We asked eight experts to evaluate the items of Persian version of this scale and then calculated quantitative validity, where I-FVI, CVI, and CVR were 1.00, 0.96, and 1.00, respectively, indicating that the Persian version of this questionnaire has good quantitative validity. The Cronbach's alpha coefficient was 0.84.

2.2.3. Sedentary Behavior: ST was subjectively evaluated through the Adolescent Sedentary Activity Questionnaire (ASAA) (25). The original ASAA has 11 questions for weekdays and 12 questions for weekends. The ASAQ asks participants about the time they spend sitting during various activities, such as screen time, commuting, crafts and hobbies, sitting with friends, and practicing a

musical instrument during a normal week and a normal weekend. In this context, the time spent on an activity in a particular category can be calculated. The final score was obtained as an average of all days of the week, including the weekend. For measuring quantitative validity, eight experts were requested to evaluate the items of Persian version of this scale. Afterwards, we calculated quantitative validity, where I-FVI, CVI, and CVR were 0.88, 0.90, and 0.92, respectively, indicating that the Persian version of this questionnaire has good quantitative validity. The Cronbach's alpha coefficient was 0.93.

2.3. Data Analysis

Mean and standard deviation (SD) were employed for data description. We utilized Kolmogorov-Smirnov test for assessing the data normality. Spearman correlation test was used to compute the correlations between the variables. Structural equation modelling was employed to analyze the structural correlations between the research variables. P value was determined at $P<0.05$.

3. Results

3.1. Descriptive Statistics and Bivariate Correlations

Our sample included 384 teenager girls with an age range of 16-18 years (average age of 16.93±0.72 years), out of whom, 174 studied in the 10th grade, 120 in the 11th grade, and 90 in the 12th grade. Mean and SD of the heigh and weight of teenage girls were 1.62±0.12 m and 55.63±6.47 kg, respectively. Table 1 represents descriptive data and correlation results. Descriptive findings revealed that PSD level of our sample was higher than the medium level (42.93 out of 70). This indicated that the level of PSD is almost high within the coronavirus outbreak. Moreover, the amount of PA was relatively low among the teenage girls during this time (1.73 out of 7). On the other hand, ST was almost high among our participants within the coronavirus outbreak (6.70 hours a day on average). These data showed that our teenage girls had almost difficult conditions regarding mental and physical health.

Kolmogorov-Smirnov tests found that the variables did not have a normal distribution (all $P<0.05$). The results of Spearman correlation tests (Table 1) showed: 1) a significant inverse association between PSD and PA ($r=-0.627$, $P<0.001$); 2) a significant direct association between PSD and ST ($r=0.481$, $P<0.001$); 3) a significant indirect relationship among PA and ST ($r=-0.543$, $P<0.001$).

3.2. Structural Equation Modelling

Table 2 and Figure 1 demonstrate structural equation modelling. Our findings reveled that: 1) PA significantly and inversely affected PSD in the teenage girls within the coronavirus outbreak ($\beta=0.527$, $T=-8.827$); 2) ST significantly and directly affected PSD among the teenage girls within the coronavirus outbreak ($\beta=0.367$, $T=5.713$); 3) PA significantly and inversely influenced ST among the teenage girls within the coronavirus outbreak ($\beta=0.492$, $T=-7.554$). The results of model fit implied that the research model has good fit (RMSEA=0.05; $X^2/df=2.91$; RMR=0.03; NFI=0.95; CFI=0.94).

4. Discussion

The present study was designed to examine

Table 1: Descriptive data and associations between the variables

	Mean±SD	1	2	3
1. Psychosocial Distress	42.93±10.90	-		
2. Physical Activity	1.93±0.71	r=-0.627 P<0.001	-	
3. Sedentary Behavior	6.70±2.82	r=0.481 P<0.001	r=-0.543 P<0.001	-

Table 2: Findings of path analysis

	Path	β	T-value
1	Physical Activity=> Psychosocial Distress	0.527	-8.827
2	Sedentary Behavior=> Psychosocial Distress	0.367	5.713
3	Physical Activity=> Sedentary Behavior	0.492	-7.554

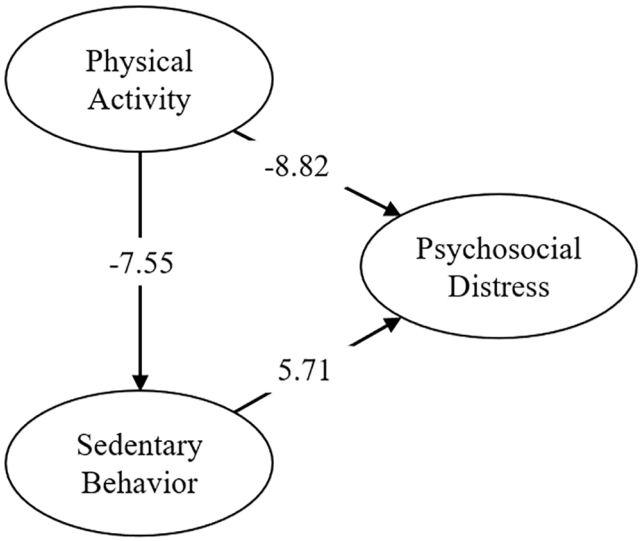

Figure 1: The figure shows the structural correlations between the research variables.

the PSD status among teenage girls within the coronavirus outbreak. Moreover, we aimed to investigate whether the level of PA and ST are related to that of PSD among teenage girls during this period. The obtained results revealed that PSD level of the teenage girls was almost high within the coronavirus outbreak (43.50 out of 70). Furthermore, the level of PA was relatively low (2.00 out of 7) while that of ST was almost high (6.75 hours a day) among our subjects during this time. These findings are in line with those reported by past research (4-9). This is often quite justifiable due to numerous changes within the everyday ways of life of children and teenagers (school students) during the pandemic. The impossibility of normal communal relationships with counterparts, depression, fear of missing relatives, health services-related issues, budgetary misfortune, and perusing or listening to news may well be considered as factors for the foremost common dangers and stressors within the coronavirus outbreak (8, 9).

Furthermore, the results herein demonstrated that PA was inversely correlated with PSD whereas ST was significantly and directly correlated with PSD in teenage girls within the coronavirus outbreak. In addition, PA and ST were found to play an important role in the mental health of the teenage girls. In this regard, an increase in PA results in a decrease in PSD and a rise in ST leads to a higher level of PSD among teenage girls within the coronavirus outbreak. These findings are in line with those reported by past research among adults (10-15). These results suggested that being active during life is related to a lower level of PSD in teenage girls. In fact, within the coronavirus outbreak, teenage girls were exposed to several barriers for engaging in PA (closure of schools and gyms, as well as indoor and outdoor recreational spaces) which consequently led to increased ST (mobile and internet use, TV watching). Thus, it is necessary to support teenage girls with alternative activities (engaging in home-based PA or attending in online fitness courses) in order to promote active lifestyle and reduce ST in an attempt to improve their mental health.

4.1. Limitations

A limitation in this study was that we employed a cross-sectional method which makes impediments for analyzing the causal relationships between PSD, and PA and ST among teenage girls within the coronavirus outbreak. Second, socio-economic conditions of the participants were not considered in this study, which might affect structural associations between the research variables. Finally, we assessed PA and ST using questionnaires which might increase bias in our results. Using accelerometer may increase the validity of data.

5. Conclusion

In conclusion, we indicated that the level of PSD, PA, and ST of teenage girls are in danger as a result of the coronavirus outbreak. Furthermore, increased PA results in a decrease in PSD, and a rise in ST leads to a higher level of PSD among teenage girls during this period. These findings proposed that active lifestyle can be assumed as an essential variable in increasing the physical and psychological wellbeing of teenage girls within the coronavirus outbreak. Hence, when a pandemic occurs, having an active lifestyle help maintain mental health among girls. Thus, it is of great necessity to support teenage girls with alternative PA, such as home-based PA, in order to increase active lifestyle and reduce ST.

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Ethical Approval

In this research, we applied a descriptive-

correlation design. The protocol was affirmed with code of IR.IAU.AK.REC.1400.001. Teenagers and their parents signed an informed consent.

Conflict of Interest: None declared.

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