# COVID-19 Preventive Behaviors among Adolescent Girls in Bangladesh

## BY

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**Abstract**

Adolescence is a stage of transition of life that affected the physical and psychological development of health by the pandemic COVID-19. Throughout the world, in this pandemic period affected public health to maintain preventive measures such as isolation, social distance and lockdown. Preventive behaviors specially for adolescents, who have to spend much time in school plays a vital role to prevent the spread of infection in the community through transmission in schools. **Objective:** To assess the COVID-19 preventive behaviors among adolescent girls in Bangladesh. **Method:** A descriptive correlational study design was used. The sample size consisted of 102 adolescent girls and convenience sampling technique was used. Data were analyzed by using descriptive statistics such as frequency, percentage, mean, standard deviation to describe the sample characteristics and inferential statistics such as t-test, correlation, ANOVA to examine the relationship among socio-demographic characteristics, health related characteristics and COVID-19 preventive behaviors of the participants. **Results:** The results showed that participants reported moderate levels of COVID-19 preventive behaviors ($3.72 \pm .426$). There was statistically significant relationship among covid-19 preventive behaviors with the participants residence ($p < .01$), sources of information ($p < .01$), parent's education ($p < .05$) and knowing symptoms of COVID-19 ($p < .01$). **Conclusion:** This study suggests the necessity of developing educational and supportive interventions programs with more focus on those who live in rural areas, have parents with little or no formal education, have fewer opportunities to access information sources, and who are unaware of the symptoms of COVID-19 in order to increase awareness and practice COVID-19 preventive behaviors.

**Keywords:** Preventive Behaviors, Covid-19, Adolescents

## INTRODUCTION

The coronavirus disease 2019 (COVID-19) is a highly contagious and potentially fatal infectious disease. COVID-19 is caused by the new virus named Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) (Vargas et al., 2020). The World Health Organization (WHO) declared COVID-19 as a public health emergency of international concern on January 30, 2020, and a global pandemic on 11 March, 2020 (WHO, 2020). In Bangladesh, the first COVID-19 cases were confirmed on March 8 and death were reported on March 18, 2020 (WHO, 2020). Since then, the virus quickly spread and the country has about 2 million cases with

29,127 deaths (Institute of Epidemiology, Disease Control, and Research [IEDCR], 2022). There were more than 513 million cases and more than 6 million deaths in the world (WHO, 2022). In the world, the COVID-19 mortality rate was 1.21% and 1.49% in Bangladesh (Bangladesh Computer Council [BCC], 2022).

Adolescence is a unique transitional phase of life of human growth and development that occurs between childhood and adulthood (Ministry of Health and Family Welfare [MoHFW], 2016). WHO defines adolescents as an individual in the 10 - 19 years of age groups (WHO, 2006). Behaviors established in adolescence that can have long-term effects on health outcomes (Wang et al., 2021). The public health measures to control the pandemic, such as extended self-isolation, physical distancing, lockdowns of communities, and the closures of schools, may have adverse effects on the development and health of adolescents (Addae, 2020). In the prevention of respiratory infection, it is important to maintain the respiratory behavior in community people specially for adolescents those who spend more time in school (Song, & Yang, 2016). In this situation, it is essential to know the factors that can influence the adolescents to follow COVID-19 preventive behaviors and to differentiate them from the general people.

Preventive behaviors of COVID-19 are still to avoid exposure to the virus even after one has been fully vaccinated (The Centers for Disease Control and Prevention [CDC], 2021). Preventive behaviors are recommended by CDC such as hand washing, social distancing, using hand sanitizer, wearing a face mask (CDC, 2021). People also followed some approaches to reduce coronavirus transmission such as avoid touching face; disinfecting surfaces; staying home if sick, coughing, and sneezing etiquette (Aschwanden et al., 2021). Most young people were adopting behavior important to slow down the infection rates such as avoiding unnecessary travel, washing hands more frequently, avoiding crowded places, wearing masks while going out. Frequent hand washing with soap and water, using hand sanitizer when one cannot access water and soap for hand-washing were also followed by the young people (Karijo et al., 2021).

Several factors are related to COVID-19 preventive behaviors such as gender, age, education, and economic status (Hou et al., 2021; Sanchez-Arenas, Doubova, Gonzalez-Perez, & Perez-Cuevas, 2021). Study found that adolescent girls represented less COVID-19 preventive behaviors (Sanchez-Arenas et al., 2021). Residences also found as the factors of COVID-19 preventive behaviors in many studies (Gutu et al., 2021; Hossain et al., 2020; Rabbani et al., 2021). Sources of information were one of the factors that played important roles in COVID-19 preventive behaviors specially social media and television (Rabbani et. al., 2021; Gutu et al., 2021). People were found to have less adherence to follow even some people did not follow the rules of COVID-19 preventive measures after vaccination (YouGov, 2020) although engaging in preventive behaviors was suggested by CDC even after one has been fully vaccinated against COVID-19 (CDC, 2021). Study found that number of family members and parents education also associated with COVID-19 preventive behaviors (Hou et al., 2021).

Several studies were conducted on this pandemic situation. There was limited study regarding COVID-19 preventive behaviors among adolescent girls in Bangladesh. Thus investigator would like to assess the COVID-19 preventive behaviors among adolescent girls in Bangladesh. On the other hand, nurses are the frontline healthcare provider who have responsibilities to work across schools and the community to manage the pandemic situation. Therefore, this study will be able to provide information regarding COVID-19 preventive behaviors to create awareness of school students. Thus health education program will be organized in the school as well as in the community based on the findings which will be helpful to prevent the spread of infections.

## Objectives of the Study

General Objective

To assess the COVID-19 preventive behaviors among adolescent girls in Bangladesh.

Specific Objectives

1. To describe the socio-demographic characteristics among adolescent girls in Bangladesh.
2. To describe the health-related characteristics of COVID-19 preventive behaviors among adolescent girls in Bangladesh.
3. To examine the relationship among socio-demographic characteristics, health-related characteristics, and COVID-19 preventive behaviors of adolescent girls in Bangladesh.

## METHODS

This study describes the research methodology including study design, study participants, instruments, data collection methods, and data analysis of the study.

### 1. Study design

A descriptive correlational study design was used in this study to assess the COVID-19 preventive behaviors among adolescent girls in Bangladesh. The study period was from July 2021 –June 2022.

### 2. Study participants

The participants of this study were all adolescent girls at Laxmipur Girls High School and Santinagor Dakhil Madrasa, Rajshahi. The sample size was estimated by using G-power analysis with the accepted significant level (α) 0.05, medium effect size 0.3, and power 0.80, and produced sample size was 85 (Polit, & Beck, 2017). By considering a 20% attrition rate the final sample size was 102 adolescent girls. A convenience sampling technique was used to select the study participants those who met the following inclusion criteria: (1) girls who study in class nine and ten (2) willing to participate in the study.

### 3. Instruments

The instruments of this study consisted of three parts with 32 items: part I is socio-demographic characteristics questionnaire (9 items), part II is health related characteristics questionnaire (9 items), and part III is preventive behavior-related questionnaire (14 items).

Part-I. Socio-demographic Characteristics Questionnaire

The socio-demographic characteristics and health-related questionnaire was developed by the investigator based on review of the literature. This questionnaire consisted of 9 items including the following information about the participants: age, religion, class of study, parents' level of education, residence, monthly family income, type of family, and sources of information.

**Part-II. Health Related Characteristics Questionnaire**
The health-related characteristics questionnaire was developed by the investigator based on review of the literature. This questionnaire consisted of 9 items including the following information about the participants: previous illness, affected by Covid-19, family history of COVID-19 positive, getting COVID-19 vaccination, feeling anxiety of pandemic situation, history of respiratory diseases, spread of coronavirus and symptoms of COVID-19.

**Part-III. Preventive Behavior-Related Questionnaire**
The preventive behavior-related questionnaire (PBRQ) was developed by the researcher based on review of the literature. The preventive behavior was measured by the preventive behavior-related questionnaire. It consists of 14 items and responses were assessed on a five-point Likert scale ranging from 1= "never" to 5= "almost always". The higher scores were indicated as the higher COVID-19 preventive behaviors of adolescent girls.

**Validity of the Instruments**
The content validity of all the instruments was examined by 3 experts, Faculty of Nursing, National Institute of Advanced Nursing Education Research (NIANER). The comments of the experts were used to modify each questionnaire as appropriate.

**Reliability of the Instruments**
The reliability of the instruments (PBRQ) were tested by using Cronbach's alpha coefficient for internal consistency which was α= 0.77, indicating acceptable internal consistency.

### 4. Data Collection Methods
Data was collected after approval from Institutional Review Board (IRB) from National Institute of Advanced Nursing Education and Research (NIANER). Permission was taken from the head teacher of the schools as well as the participants. The investigator was explained the study purpose and process of data collection. The participants were informed to volunteer to participate in this study and they could withdraw from the study at any time. Written consent was taken from the eligible subjects. A structured questionnaire was prepared in English language and translated into Bengali for data collection. Data was collected from February 2022 to March 2022 by using structured self-administered questionnaire in the school with those who met the inclusion criteria. Privacy, confidentiality, and anonymity were maintained by the investigator.

### 5. Data Analysis
Data was analyzed by using computer software program. Both descriptive as well as inferential statistics were used for analyzing the data. In descriptive statistics data were presented by frequencies, percentages mean, and standard deviation to describe the participants' characteristics. Inferential statistics such as

Pearson product-moment correlation, ANOVA, and two sample t-tests were used to examine the relationship among socio-demographic characteristics, health-related characteristics, and COVID-19 preventive behaviors of the participants. A value of P ≤ 0.05 was considered statistically significant.

## RESULTS
This chapter presented the findings of the study in four parts- socio-demographic characteristics among adolescent girls, health-related characteristics among adolescent girls, COVID-19 preventive behaviors among adolescent girls and relationship among socio-demographic characteristics, health-related characteristics, and COVID-19 preventive behaviors of adolescent girls.

**Table 1: Distribution of Socio-demographic Characteristics among Adolescent Girls (N=102)**

| Variables | Category | n | (%) |
|---|---|---|---|
| Age (years) (15.27 ± 1.162), Min-Max= 13-18 | | | |
| Religion | Muslim | 102 | 100 |
| Class of study | Class Nine | 51 | 50 |
| | Class Ten | 51 | 50 |
| Mothers' education | Primary & less | 42 | 41.2 |
| | Secondary | 38 | 37.3 |
| | Higher secondary & above | 22 | 21.1 |
| Fathers' education | Primary & less | 42 | 41.2 |
| | Secondary | 25 | 24.5 |
| | Higher secondary & above | 35 | 34.3 |
| Residence | Urban area | 46 | 45.1 |
| | Rural area | 56 | 54.9 |
| Monthly family income (TK) (16049.02 ± 7406.683), Min-Max= 10000-50000 | | | |
| Types of family | Nuclear family | 85 | 83.3 |
| | Extended family | 17 | 16.7 |
| Sources of information | Social media | 25 | 24.5 |
| | Public announcement with megaphone | 1 | 0.98 |
| | Television | 76 | 74.5 |

**Socio-demographic Characteristics among Adolescent Girls**
The participants of this study were 102 adolescent girls at Laxmipur Girls High School and Santinagor Dakhil Madrasa, Rajshahi. The age of the participants ranged from 13 to 18 years (15.27 ± 1.162). All the participants were Muslim. Among all of the participants both class nine and class ten were fifty percent (50%). More than forty percent (41.2%) mother of the participants had education level primary & less, 37.3% had education level of

secondary school and 21.1% had education level higher secondary school and above.

More than forty percent (41.2%) father of the participants had education level primary & less, 24.5% had education level of secondary school and 34.3% had education level higher secondary school and above. More than half of the participants lived in rural area (54.9%). Monthly family income of the participants was ranged from 10000 to 50000 taka which was average approximately 16050 taka per month. Majority (83.3%) of participants lived in nuclear family. Near about three-fourth of them gain information about COVID-19 from television (74.5%).

**Table 2: Distribution of Health-related Characteristics among Adolescent Girls (N=102)**

| Variables | Yes | |
|---|---|---|
| | n | (%) |
| Have you been previously suffered from any illness? | 10 | 9.8 |
| Have you ever been affected by COVID-19? | 2 | 1.96 |
| Has anyone in your family been positive of COVID-19? | 8 | 7.8 |
| Have you gotten COVID-19 vaccination? | 97 | 95.1 |
| Do you feel anxious regarding this pandemic situation? | 59 | 57.8 |
| Have you any previous respiratory disease? | 7 | 6.9 |
| Have any respiratory diseases of anyone of your family? | 26 | 25.5 |
| Do you know how does the coronavirus spread? | 98 | 96.1 |
| Do you know what the symptoms of COVID-19 are? | 89 | 87.3 |

**Health-Related Characteristics among Adolescent Girls**

Health-related characteristics among adolescent girls showed that 9.8% were suffered from any previous illness. Only 2% adolescent girls were affected by COVID-19 and more than seven percent (7.8%) of their family members had been COVID-19 positive. Most of them had got COVID-19 vaccination (95.1%). More than fifty percent (57.8%) of the subjects felt anxious regarding this pandemic situation. More than six percent (6.9%) of them and about one-fourth (25.5%) of their family members had previous respiratory disease. Majority of them knew about how to spread the corona virus (96.1%) and symptoms of it (87.3%).

**Table 3: Distribution of COVID-19 Preventive Behaviors among Adolescent Girls (N= 102). Never= 1, Almost always= 5.**

| Items | Never | Rarely | Sometimes | Mostly | Almost always | M ± SD |
|---|---|---|---|---|---|---|
| | n(%) | n(%) | n(%) | n(%) | n(%) | |
| I do not go outside unnecessarily. | 15(14.7) | 5(4.9) | 73(71.6) | 9(8.8) | 0(0) | 2.75 ± .817 |
| I wear a mask if go outside. | 2(1.96) | 1(1.02) | 11(10.8) | 38(37.3) | 50(49.0) | 4.30 ± .854 |
| I maintain respiratory etiquette (cover my mouth and nose by elbow or tissue while sneezing or coughing). | 0(0) | 5(4.9) | 11(10.8) | 49(48.0) | 37(36.3) | 4.16 ± .805 |
| I wash hands to minimize contamination. | 1(1.02) | 0(0) | 12(11.8) | 55(53.9) | 34(33.3) | 4.19 ± .714 |
| I maintain social distance of at least 1 meter from others. | 0(0) | 8(7.8) | 69(67.6) | 17(16.7) | 8(7.8) | 3.25 ± .710 |
| I avoid public gatherings. | 0(0) | 4(3.9) | 32(31.4) | 49(48.0) | 17(16.7) | 3.77 ± .770 |
| I keep my clothes and other things (e.g wrist watch, shoes, etc) separately after coming from outside. | 0(0) | 2(1.96) | 26(25.5) | 42(41.2) | 32(31.4) | 4.02 ± .808 |

**Table 3 (continued)**

| | Never | Rarely | Sometimes | Mostly | Almost |
|---|---|---|---|---|---|

| Items | | | | always | M ± SD |
|---|---|---|---|---|---|
| | n(%) | n(%) | n(%) | n(%) | n(%) | |
| I clean my used things just after entering the home from outside. | 0(0) | 2(1.96) | 61(59.8) | 28(27.5) | 11(10.8) | 3.47 ± .713 |
| I maintain precaution to contact with people who are suspected of COVID-19. | 0(0) | 0(0) | 13(12.7) | 51(50.0) | 38(37.3) | 4.25 ± .667 |
| I carry a hand sanitizer in my school bag. | 2(1.96) | 1(1.02) | 51(50.0) | 21(20.6) | 27(26.5) | 3.69 ± .944 |
| I do not use public transportation. | 13(12.7) | 12(11.8) | 27(26.5) | 35(34.3) | 15(14.7) | 3.26 ± 1.226 |
| I do not eat outside from home. | 2(1.96) | 15(14.7) | 58(56.9) | 17(16.7) | 10(9.8) | 3.18 ± .872 |
| I do not leave the home if I have symptoms of fever and cough. | 1(1.02) | 5(4.9) | 23(22.5) | 49(48.0) | 24(23.5) | 3.88 ± .859 |
| I carry clean tissue papers when I go outside. | 0(0) | 1(1.0) | 44(43.1) | 24(23.5) | 33(32.4) | 3.87 ± .886 |

Total mean score of preventive behaviors = 3.72 ± .426

## COVID-19 Preventive Behaviors among Adolescent Girls

The COVID-19 preventive behaviors of adolescent girls were presented in Table 2. The mean score of preventive behaviors was (3.72 ± .426) out of a maximum 5 points which indicated a moderate level of COVID-19 preventive behaviors. Regarding COVID-19 preventive behaviors, 32.4% participants had high preventive behaviors, 32.4% had moderate preventive behaviors, and 35.3% had low preventive behaviors.

Among the questions that measure participants' performance in preventing behaviors from COVID-19, when each item of higher preventive behaviors with the highest percentage was considered, participants almost always wore a mask when they went outside (49.0%), maintained precaution to contact with COVID-19 suspected persons (37.3%), maintained respiratory etiquette (36.3%), washed hands to minimize contamination (33.3%), carried clean tissue papers when going outside (32.4%). When each item of lower preventive behaviors with the lowest percentage was considered, participants almost always did not go outside unnecessarily (0%), maintained social distance of at least 1 meter from others (7.8%), did not use public transportation (14.7%), did not eat outside from home (9.8%).

Table 4: Relationship among Socio-demographic characteristics, Health-related characteristics, and COVID-19 Preventive Behaviors among Adolescent Girls (N=102).

| Variables | COVID-19 Preventive Behaviors | |
|---|---|---|
| | Mean ± SD | r/t/F (*p*) |
| Age | | .140 (.159) |
| Class of study | | |
| Class Nine | 3.76 ± .471 | .946 (.346) |
| Class Ten | 3.68 ± .375 | |
| Mothers' education | | |

| | | |
|---|---|---|
| Primary & less | 3.59 ± .371 | 3.696 (.028) |
| Secondary | 3.77 ± .431 | |
| Higher secondary & above | 3.87 ± .463 | |
| Fathers' education | | |
| Primary & less | 3.54 ± .325 | |
| Secondary | 3.70 ± .471 | 10.047 (.000) |
| Higher secondary & above | 3.94 ± .405 | |
| Residence | | |
| Urban area | 4.02 ± .332 | 8.703 (.000) |
| Rural area | 3.46 ± .315 | |
| Monthly family income | | .093 (.351) |
| Types of family | | |
| Nuclear family | 3.70 ± .426 | -.644 (.521) |
| Extended family | 3.78 ± .432 | |
| Sources of information | | |
| Social media | 3.95 ± .433 | 5.220 (.007) |
| Public announcement with megaphone | 3.57 ± 0 | |
| Television | 3.64 ± .401 | |
| Have you been previously suffered from any illness? | | |
| Yes | 3.94 ± .393 | 1.732 (.086) |
| No | 3.69 ± .424 | |
| Have you ever been affected by COVID-19? | | |
| Yes | 4.00 ± .404 | .951 (.344) |
| No | 3.71 ± .426 | |

**Table 4 (continued)**

| Variables | COVID-19 Preventive Behaviors | |
|---|---|---|
| | Mean ± SD | F/r/t (*p*) |
| Has anyone in your family been positive of COVID-19? | | |
| Yes | 3.81 ± .358 | .663 (.509) |
| No | 3.71 ± .432 | |
| Have you gotten COVID-19 vaccination? | 3.73 ± .421 | 1.403 (.164) |
| Yes | 3.46 ± .475 | |
| No | | |
| Do you feel anxious regarding this pandemic situation? | | |
| Yes | 3.55 ± .326 | -5.147 (.000) |
| No | 3.94 ± .445 | |
| Have you any previous respiratory disease? | 3.82 ± .389 | .642 (.523) |

| | | |
|---|---|---|
| Yes | $3.71 \pm .429$ | |
| No | | |
| Have any respiratory disease anyone of your family? | | |
| Yes | $3.58 \pm .383$ | -1.882 (.063) |
| No | $3.76 \pm .432$ | |
| Do you know how does the coronavirus spread? | $3.73 \pm .415$ | 1.298 (.197) |
| Yes | $3.45 \pm .656$ | |
| No | | |
| Do you know what are the symptoms of COVID-19? | | |
| Yes | $3.77 \pm .406$ | 3.484 (.001) |
| No | $3.35 \pm .386$ | |

## 6. Relationship among Socio-demographic Characteristics, Health related Characteristics and COVID-19 Preventive Behaviors of Adolescent Girls

Relationship between socio-demographic and COVID-19 preventive behaviors among 102 adolescent girls were presented in Table 4. Bivariate analysis was done to examine the relationship among socio-demographic, health-related characteristics, and COVID-19 preventive behaviors among adolescent girls in Bangladesh. Preventive measures regarding COVID-19 were found statistically significant of those mothers had education level higher secondary and above (F = 3.696, p = .028) and also those fathers had education level higher secondary and above (F= 10.047, p =.000) which was statistically highly significant.

Participants who lived in urban area were found to have statistically highly significant relationship with preventive behaviors (t= 8.703, p=.000). Participants were reported good preventive behaviors who had higher monthly family income (F= 15.987, p =.000). There were statistically significant relationships among sources of information with preventive behaviors (F= 5.220, p= .007). Study result found statistically significant relationship of those participants who knew the symptoms of COVID-19 (t = 3.484, p=.001). The subjects who had more preventive behavior were not found to feel anxiety (t= 3.484, p= .001). The rest of the variables were non-significant towards COVID-19 preventive behaviors.

## DISCUSSION

This study was conducted to assess the COVID-19 preventive behaviors among adolescent girls in Bangladesh. The findings were discussed in four parts: socio-demographic characteristics; health-related characteristics; COVID-19 preventive behaviors and relationship among socio-demographic characteristics, health-related characteristics, and COVID-19 preventive behaviors of adolescent girls.

### 1. Socio-demographic Characteristics among Adolescent Girls

The study was conducted among 102 adolescent girls who lived in Rajshahi city at Laxmipur Girls High School and Santinagor Dakhil Madrasa, Rajshahi. The mean age of this study's participants was 15.27 years (SD= 1.162). Another study was conducted regarding covid-19 experience with adolescents where the mean age was 15 years (Wang et al., 2021). In this study, the majority of parents had education level primary and less. In contrast, previous study conducted with COVID-19 prevention and vaccination behaviors among Chinese children and adolescents found that the majority of parents had education level bachelor's degrees or above (Hou et al., 2021). Another study was conducted regarding COVID-19 hand hygiene, mask-wearing behaviors and its associated factors among primary school students found that the majority of parents had education level undergraduate (Chen et al., 2020).

More than fifty percent of the participants lived in rural area which finding was similar with another study where more than sixty percent people lived in rural area (Rabbani et. al., 2021) and in contrast with previous studies which found that the majority of participants lived in urban area (Rahman & Sathi, 2020; Gutu et al., 2021). Majority of the participants in this study lived in nuclear family. Similarly, another previous study found that participants lived in nuclear family (Ferdous et al., 2020). Near about three-fourth of the participants got information about COVID-19 with a main source of television. Similarly, previous studies found that most of the participants' main source to gain information about COVID-19 was television (Rabbani et. al., 2021; Gutu et al., 2021).

### 2. Health-Related Characteristics among Adolescent Girls

In this study near about only ten percent participants suffered from previous illness. Another study found that more than five percent participants had the presence of underlying medical conditions (Sanchez-Arenas et al., 2021). This study revealed that only few percent (2%) participants were affected by COIVD-19. The previous study found that near about eight percent participants had history of COVID-19 positive (Hossain et al., 2020). More than

seven percent of family members of the participants had been COVID-19 positive. Another study found that more than nine percent participants or family members had history of COVID-19 positive (Hossain et al., 2021).

The most of the participants had got COVID-19 vaccination. More than fifty percent of the participants felt anxious regarding this pandemic situation. Previous study also found that more than fifty percent adolescents feeling anxiety in lockdown regarding this pandemic situation (Sifat, Ruponty, Shuvo, Chowdhury & Suha, 2022). Near about seven percent of participants had previous respiratory disease. More than one-fourth of family members had previous respiratory disease. Abedin et al. (2021) found that nine percent family members of participants had previous respiratory disease. The current study found that majority of the participants knew about the spread of corona virus. Previous studies also found that more than fifty percent participants knew how does the coronavirus spread (Al-Hanawi et al., 2020; Rahman et al., 2021). In this study, more than eighty percent participants knew the symptoms of COIVD-19. Similarly, previous studies found that more than ninety percent participants knew main symptoms of COVID-19 (Zhong et al., 2020; Al-Hanawi et al., 2020).

### 3. COVID-19 Preventive Behaviors among Adolescent Girls

Findings of this study showed that the adolescent girls reported the moderate level of total preventive behaviors. In contrast, another study found that the participants reported the low level of total preventive behaviors (Gutu et al., 2021). In this study, the higher preventive behaviors that the participants almost always followed were near about fifty percent wore a mask when going outside, more than thirty percent maintained precaution of contact with COVID-19 suspected persons, maintained respiratory etiquette, washed hands to minimize contamination, carried clean tissue papers when going outside. Another study found the higher preventive behaviors that the participants always followed were more than eighty percent wore a mask when going out from home, covered mouth and nose when coughing or sneezing, ate freshly cooked food, washed hands before and after eating (Yodmai, Pechrapa, Kittipichai, Charupoonpol, & Suksatan, 2021).

Furthermore, the lower preventive behaviors that the participants almost always followed were near about eight percent maintained social distance of at least 1 meter from others, more than fourteen percent did not use public transportation, near about ten percent did not eat outside from home and there was no participant who did not go outside unnecessarily. Another previous study found in the lower preventive behaviors that the participants always followed were more than sixteen percent exercising and physical activity at home, more than twenty percent eat at least 3 servings of fruits and vegetables per day (Baghernezhad Hesary, Salehiniya, Miri, & Moodi, 2021).

### 4. Relationship among Socio-demographic Characteristics, Health related Characteristics and COVID-19 Preventive Behaviors of Adolescent Girls

The COVID-19 preventive behaviors with socio-demographic characteristics showed that parents' education, residence, monthly family income, sources of information were significantly associated with preventive behaviors. This study revealed that there were no significant relationship between age and preventive behaviors. This finding contrast with other studies where age had significant association in COVID-19 preventive behaviors (Hossain et al., 2020; Rahman & Sathi, 2020; Ferdous et al., 2020; Rabbani et. al., 2021).

This study found significant association between COVID-19 preventive behaviors with parents' education which indicate that parents' of the participants with higher education level had good COVID-19 preventive behaviors. Another study also found the similar result (Chen et al., 2020). Parents with higher education level had good knowledge about COVID-19 preventive behaviors and for this reasons those parents could influence their child about it. In this study participants who lived in urban area showed good preventive behaviors more than those who lived in rural area. This finding is consistent with other global studies (Gutu et al., 2021; Pinchoff et al., 2020) as well as some studies in Bangladesh (Ferdous et al., 2020; Hossain et al., 2020; Rabbani et al., 2021; Rahman et al., 2021). People may not adhere to national restriction measures and individual hygiene precautions in rural areas because they do not believe they are at a high risk of COVID-19.

This study reported that preventive behaviors had no significant relationship with monthly family income. In contrast, previous studies found that participants were reported good preventive behaviors who had higher monthly family income (Ferdous et al., 2020; Banu et al., 2021; Rabbani et al., 2021). The preventive behaviors were not significant by types of family in this study which finding is consistent with other studies (Ferdous et al., 2020; Hou et al., 2021). Social media as a source of information was also significantly associated with preventive behavior for COVID-19 which indicates that participants using social media had good COVID-19 preventive behaviors. Consistently another study also found that those who used social media as a source of information were more than 2 times more likely to have good preventive behavior compared to those who did not used it (Gutu et al., 2021). Social media is one of the well-known and easy accessed sources of information that helps to disseminate information to people so rapidly and easily.

## CONCLUSION AND RECOMMENDATION

### 1. Conclusion

This study results indicated that participants lived in urban area, parents' with higher education, used social media as a source of information, knew symptoms of COVID-19 and not felt anxious in this pandemic had the highest preventive behaviors of COVID-19. This study suggests the necessity of developing educational and supportive interventions programs with more focus on those who live in rural areas, have parents with little or no formal education, have fewer opportunities to access information sources, and who are unaware of the symptoms of COVID-19 in order to increase awareness and practice COVID-19 preventive behaviors. Health education programs need to be conducted for school students as well as in the community to increase awareness through health personnel to prevent the spread of infection.

## 2. Recommendations

This study finding will be implemented in nursing practice, nursing education, and nursing research. In nursing practice, to provide valuable information for nurses in clinical practice to gain better understanding about preventive behaviors of COVID-19. In nursing education, findings of this study could provide a better understanding for nurse educators who teach about preventive behaviors of COVID-19. In nursing research, this study findings could provide baseline information for further research. Researcher recommended that further study to be conducted with large sample size and more settings to generalize the findings.

## ACKNOWLEDGEMENT

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