

## Academic Students' Awareness, Attitudes, and Preventative Measures Regarding COVID-19 in Riyadh, Saudi Arabia

Sumaya Ahmed Almefleh<sup>1</sup>, Mohammed Abdullah Meryazan<sup>2</sup>, Khalid Naif Alotaibi<sup>3</sup>, Abdulmajeed Saad bin Baz<sup>4</sup>, Bader khalaf Q Alruwaily<sup>5</sup>, Meshal Ali M Alqahtani<sup>6</sup>

<sup>1,2,3,4,5,6</sup>Sumaya Ahmed Almefleh Ministry of Health, Saudi Arabia

### ABSTRACT

**Background:** Coronavirus is exceedingly contagious, and an effective treatment has yet to be identified. However, its transmission can be halted or slowed by employing preventative measures and remaining informed about the disease and its mode of transmission. **Objectives:** This study investigates the knowledge, attitudes, and behaviors of Riyadh schoolchildren regarding COVID-19.

**Method:** From April to June of 2022, this cross-sectional research involved students between the ages of 12 and 18 from various schools in Riyadh. The information was gathered via an internet-based survey employing a pre-validated Arabic survey questionnaire.

**Results:** A significant majority of 253 students (91.3%) exhibited a profound comprehension of the transmission of COVID-19. In addition, headache 87.7%, loss of taste and smell 92.5%, and fever 94.5% were the most frequently reported symptoms by students. The high knowledge score was predicted by secondary school students versus intermediate school students (OR=0.243, 95%CI: (0.072-0.819), p<0.05) and elder versus younger students (OR=0.306, 95%CI: (0.092-1.024), p<0.05). A majority of students (69.2%) express support for notifying health authorities of any symptoms they experience, while 71.9% consent to isolation should they come into contact with an infected individual. Preventive measures were practiced with greater zeal by female students compared to male students (P-value <0.0001). Information was obtained primarily through social media.

**Conclusion:** The majority of respondents were informed, held logical views, and took preventative measures against COVID-19. The fact that respondents became aware of COVID-19 through social media demonstrates the positive impact it has had on public health consciousness. Our research may not reflect the knowledge, attitudes, and preventative behaviors of Riyadh pupils regarding COVID-19. It furnishes vital data to aid health organizations in the development and execution of preventive initiatives.

**KEYWORDS:** Knowledge, Attitudes, Preventive Behaviours, COVID-19, School Students

### ARTICLE DETAILS

**Published On:**  
**13 July 2024**

**Available on:**  
<https://ijmscr.org/>

### 1. INTRODUCTION

The novel Coronavirus (SARS-CoV-2) that initially manifested as a cluster of 'viral pneumonia' cases in December 2019 in Wuhan, China, initiated the COVID-19 pandemic. On March 11, 2020, the World Health Organization classified the COVID-

19 outbreak as a pandemic (Organization WH, 2020). Frequent manifestations of COVID-19 encompass a fever, lethargy, and a dry cough. Loss of scent or taste, nasal congestion, sore throat, headache, discomfort in the muscles or joints, vomiting, and diarrhea are additional uncommon symptoms that may affect

## Academic Students' Awareness, Attitudes, and Preventative Measures Regarding COVID-19 in Riyadh, Saudi Arabia

some individuals. Coronavirus is a highly contagious infection for which prevention is essential due to the absence of an effective treatment at this time. A thorough understanding of the disease and its mode of transmission is the most effective method for preventing and decelerating COVID-19's spread. Furthermore, it is critical to implement suitable preventive measures in order to reduce the spread of viruses (Organization WH, 2020b).

Subsequent to the initial confirmed case in Saudi Arabia on March 23, 2020 (KoSA-MoH, 2020), there was a notable surge in the number of patients in the country, reaching its highest point on June 18, 2020, with 4919 cases reported daily and 39 fatalities. Following that, the number of reported cases decreased until December 2020, at which point it started to increase once more, reaching its highest point on January 19, 2022, with 5928 cases (including 2 fatalities) (Reuters-global-tracker, 2022). Following the initial reports of a limited number of cases, the Ministry of Health has initiated public awareness initiatives aimed at enlightening the populace regarding the mode of transmission of COVID-19. In conjunction with the World Health Organization (WHO), the Saudi Ministry of Health (MOH) urged the international community to implement a number of preventative measures against contracting or transmitting COVID-19.

Adhering to crucial preventive measures entails ensuring a minimum distance of 1 meter from individuals, donning an appropriately fitted mask, and engaging in regular hand hygiene by cleansing with alcohol-based products (Li et al., 2020). In an effort to control viral transmissions, the MOH has also imposed stringent restrictions, including bans on outdoor activities, social interactions, mosque prayers, and online education. The implementation of robust infection control measures is of utmost significance in mitigating the transmission of the virus within healthcare environments and among the general populace (Saudi Press Agency, 2020; Alrashed et al., 2020). Following a period of one and a half years of online instruction, the Ministries of Education and Health declared the resumption of in-person classes for totally vaccinated intermediate and secondary school students. Subsequently, on January 23, 2022, these two ministries issued an official confirmation regarding the restoration of in-person attendance at primary schools in Saudi Arabia (Blom et al., 2022).

Notwithstanding the substantial measures implemented at the national level to avert the pandemic, the efficacy of these measures is predominately contingent upon public conduct. Given the reinstatement of in-person classes for students of all academic levels, it is critical to evaluate students' comprehension, disposition, and implementation of preventative measures against the spread of COVID-19, as this will impact their determination to adopt such measures. From April to June 2022, this research investigates the knowledge,

attitudes, and preventive behaviors of schoolchildren in Riyadh, Saudi Arabia, regarding COVID-19.

## 2. MATERIALS AND METHODS

### Study Design and settings

Academics residing in Riyadh, Saudi Arabia, participated in a cross-sectional study. A diverse sample of male and female students, representing both public and private institutions, was assembled from various regions of Riyadh (north, south, central, east, and west). The participants were administered a series of inquiries designed to assess their levels of awareness, perspectives, and preventive measures concerning COVID-19. The specific age range of the participants in the sample was 12 to 18 years. Students aged 12 or younger or older than 18 were not permitted. The primary determinant of the chosen sample was not only age, but also capability. Students with special needs who suffered from visual, auditory, or cognitive impairments were also excluded from the sample that was chosen.

A sample the subsequent equation was employed to analyze cross-sectional investigations.  $n = Z^2 [p(1-P)] / d^2$   $n = (1.96)^2 [0.8164 (1-0.8164)] / (0.05)^2$

A prior investigation, which was published in Saudi Arabia in 2020, According to the findings of Al-Hanawi et al. (2020), the collective understanding of COVID-19 was 81.64 percent. Using a 5% margin of error and a 95% confidence interval (CI), the authors determined that the ideal sample size would be 230 students; to account for the non-responses, an additional 10 percent was added, bringing the total to 253 students.

### Data collection

A total of 312 students participated in the study by completing an online self-administered survey that was disseminated to them via simple random sampling. Pupils that failed to satisfy the inclusion criteria amounted to 67 (Figure 1). Following consultations with school administrators, the hyperlink was disseminated across various social media platforms, including Telegram, WhatsApp, and Twitter. The compilation of data commenced in April and continued through June of 2022. The survey utilized a pre-validated Arabic questionnaire that had been previously created and published by Abdelhafiz AS et al. (2020).

The questionnaire was adapted by the investigators to suit the circumstances of the school students in Saudi Arabia. The subsequent inquiries were incorporated: parental and student educational attainment, prior cases of COVID-19 infection, and administration of the COVID-19 vaccine. Additionally, the following inquiries were eliminated: location of questionnaire collection, household income, smoking history, belief that COVID-19 is a biological weapon, consideration that salary should not be reduced during COVID-19 quarantine, willingness to receive the vaccine if it were available, and

## Academic Students' Awareness, Attitudes, and Preventative Measures Regarding COVID-19 in Riyadh, Saudi Arabia

purchase of protective equipment if it were priced appropriately. Additionally, in order to better accommodate Riyadh City, we reorganized the residential area into five regions: north, south, central, east, and west, rather than urban and non-urban areas. In conclusion, the questionnaire comprises the subsequent study variables:

(1) Demographic factors including domicile, age, sex, and educational attainment.

2. Clinical circumstances, including a history of chronic disorders and prior infections 3. A comprehension of the COVID-19 virus comprising 27 elements.

Four items comprise the attitude toward COVID-19 precautions. 5. Preventive measures in practice (13 elements).

The responses for the knowledge and attitude toward COVID-19 precautions section are as follows: Yes, No, and Not Sure. Moreover, for the knowledge questions, we award one point for each correct response and zero points for each incorrect or

uncertain response. On the other hand, the implementation of preventive measures was assessed using a five-point Likert scale: Certainly No, Mostly No, Not Sure, Probably Yes, and Definitely Yes. The questionnaire was reviewed by five academic specialists, including two family physicians, two school instructors, and one professor of preventive medicine. Prior to undertaking the complete research and data collection, a pilot study of the questionnaire was conducted with 20 students in order to verify its lucidity and applicability, as well as to identify any potential barriers or limitations. It was estimated to require approximately 15 minutes to complete. In light of the results obtained from the pilot investigation, the questionnaire was revised by the authors, and the individuals who participated in the pilot study were subsequently excluded from the primary study. The Cronbach's alpha coefficient for the modified instrument's scale was 80.2%.

### Data analysis

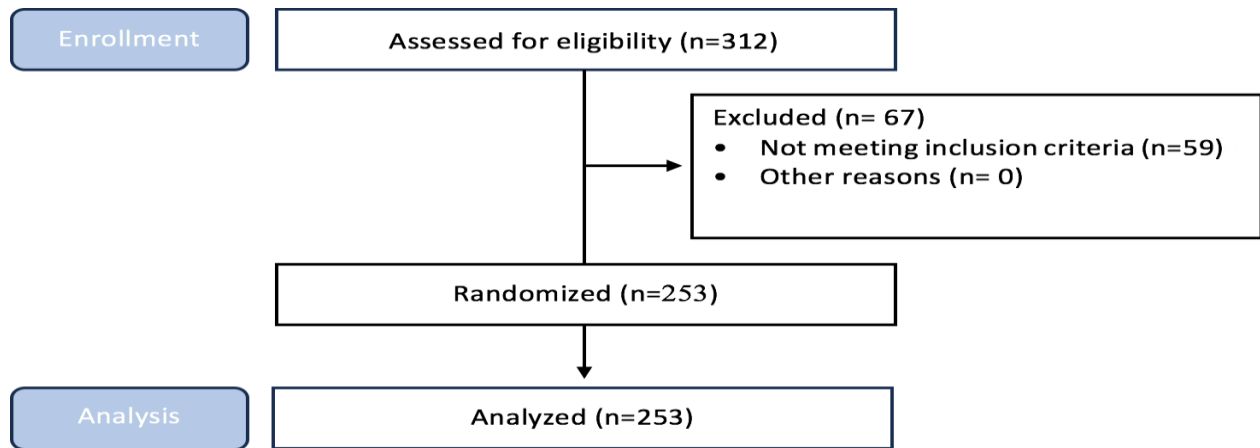


Figure 1. Flow chart of the study

IBM SPSS Statistics for Windows, version 26.0 (IBM Corp., Armonk, NY, USA), was utilized to analyze the data. The frequencies, percentages, median, and range were computed in order to characterize quantitative and categorical variables, respectively. Based on the normality test results indicating that the median knowledge score is 20, the range is from minimum 1 to maximum 26, skewness is -2.091, and kurtosis is 8.813, we classified the total knowledge scores from 27 questions as either adequate (score equal to or greater than the median) or inadequate (score below the median) knowledge.

The Mann Whitney U and Kruskal-Wallis tests were employed to compare the median scores across different groups categorized by demographic and disease characteristics. Additionally, the knowledge score was classified as <median or >median (percent) in order to examine the bivariate relationships between each categorical variable and the knowledge score categories. To investigate this association, the chi-square test was utilized. The dependent variable in this

study was the status of the knowledge score, which was analyzed using binary logistic regression. The independent variables included age, sex, education level, chronic diseases, and past COVID-19 infection. An odds ratio representing the proportion of the probability of a high knowledge score to the probability of knowledge score was provided. A significance level of 0.05 was applied to a p-value within a 95% confidence interval.

### 3. RESULTS

In this research, 253 pupils from throughout Riyadh participated. The composition of the participants comprised 119 (47%) males and 134 (53%) females; 105 (41.50%) of the participants were aged 12-15, while 148 (58.50%) were aged 16-18. 108 (42.7%) individuals had contracted COVID-19. In relation to the educational attainment of the parents, a significant proportion held bachelor's degrees: 110 (43.5%) for mothers and 105 (41.5%) for fathers (Table 1).

Table 1. Socio-demographic and clinical characteristics of the participants (n=253)

	Frequency	%
Age groups (year)		
11 – 15 y	105	41.50%
16 – 18 y	148	58.50%
Sex		
Male	119	47.00%
Female	134	53.00%
Region of Residence		
South of Riyadh	25	9.90%
North of Riyadh	80	31.60%
East of Riyadh	117	46.20%
West of Riyadh	12	4.70%
Middle of Riyadh	19	7.50%
Level of school studying		
Intermediate school	107	42.30%
Secondary school	146	57.70%
Father's education		
Below University	85	33.6%
University	168	66.4%
Mother's education		
Below University	114	45.1%
University	139	54.9%
Do you have any medical conditions?		
Yes	44	17.40%
No	209	82.60%
Have you got infected with Covid-19?		
Yes	108	42.7
No	145	57.3

Three categories were assessed in the outcome: knowledge regarding COVID-19, attitude towards COVID-19 precautions, and adherence to preventive measures. The discrepancies between the students' responses and their general knowledge concerning the transmission, symptoms, and prevention of the Coronavirus COVID-19 are illustrated in Table 2. A total of 231 students (91.3%) demonstrated a high level of knowledge regarding the transmission route of COVID-19, which was droplets. Additionally, 206 students (81.4%) understood that the virus could spread through surfaces touched by an infected individual, and 195 students (77.1%) understood that Coronavirus can be transmitted even in the absence of

symptoms. In relation to the prevalent symptoms associated with COVID-19, the following symptoms were cited by students: headache, loss of taste and scent, and fever (233 for 239 (94.5%), 234 (92.5%), and 222 (87.7%), respectively.

243 (96.0%) individuals were aware that advanced age and protracted illness increased the risk of contracting the virus. A majority of the respondents (246) (97.2%) agreed that hand washing is essential. Additionally, 246 (94.4%) agreed that donning a mask during illness and cleaning surfaces are both recommended practices (Figure 2).

## Academic Students' Awareness, Attitudes, and Preventative Measures Regarding COVID-19 in Riyadh, Saudi Arabia

**Table 2. Knowledge about COVID-19 among the participants (n=253)**

Knowledge items	Yes	No	Not sure
	No. (%)	No. (%)	No. (%)
Covid-19 spread by			
Droplets from the nose or mouth which are spread when a person with COVID-19 coughs or exhales	231 (91.3%) *	8 (3.2%)	13 (5.1%)
Surfaces touched by a person who has the disease	206 (81.4%) *	13 (5.1%)	34 (13.4%)
Coins and Banknotes	146 (57.7%)	31 (12.3%)	76 (30.0%)
Pets	41 (16.2%)	125 (49.4%)	87 (34.4%)
Stool (in public bathrooms for example)	63 (24.9%)	100 (39.5%)	90 (35.6%)
Can the Corona virus be transmitted from a person who is infected but has no symptoms?	195 (77.1%)	16 (6.3%)	42 (16.6%)
Common symptoms include			
Fever	239 (94.5%) *	3 (1.2%)	11 (4.3%)
Dry cough	200 (79.1%) *	17 (6.7%)	36 (14.2%)
Body aches and pains	214 (84.6%)	15 (5.9%)	24 (9.5%)
Runny nose	165 (65.2%)	24 (9.5%)	64 (25.3%)
Diarrhea	93 (36.8%)	82 (32.4%)	78 (30.8%)
Nasal congestion	211 (83.4%)	12 (4.7%)	30 (11.9%)
Difficulty breathing	216 (85.4%)	12 (4.7%)	25 (9.9%)
Loss of taste and smell	234 (92.5%)	9 (3.6%)	10 (4.0%)
Headache	222 (87.7%)	7 (2.8%)	24 (9.5%)
Skin rash	21 (8.3%)	149 (58.9%)	83 (32.8%)
The virus may be more dangerous for the elderly and those with chronic diseases?	243 (96.0%)	4 (1.6%)	6 (2.4%)
Measures to prevent viral spread include			
Proper hand washing and hygiene	249 (98.4%)	0 (0%)	4 (1.6%)
Maintaining an appropriate distance between yourself and anyone with symptoms	242 (95.7%)	4 (1.6%)	7 (2.8%)
Avoiding touching eyes, nose and mouth	233 (92.1%)	11 (4.3%)	9 (3.6%)
Putting on face masks in public spaces	246 (97.2%)	2 (0.8%)	5 (2.0%)
Taking antibiotic	79 (31.2%)	103 (40.7%)	71 (28.1%)
Eating garlic	60 (23.7%)	106 (41.9%)	87 (34.4%)
An effective vaccine against the virus is currently available	186 (73.5%)	30 (11.9%)	37 (14.6%)
An effective treatment against the virus is currently available	41 (16.2%)	135 (53.4%)	77 (30.4%)
Antibiotics can treat the disease	31 (12.3%)	112 (44.3%)	110 (43.5%)

\*Correct answer

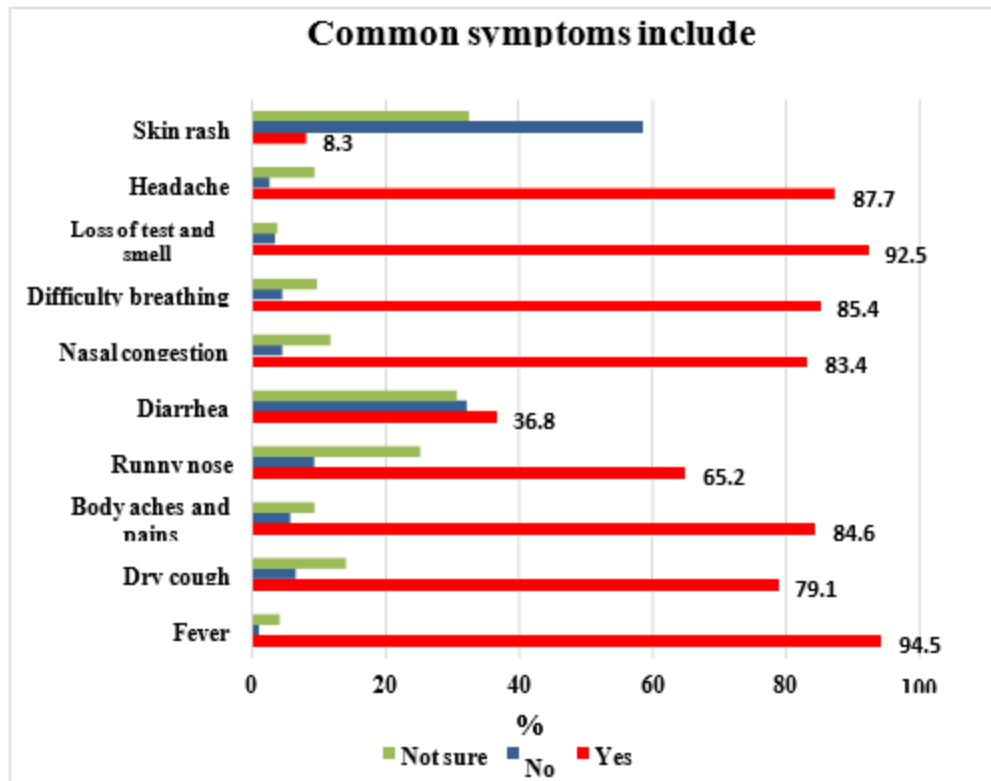


Figure 2. bar diagram illustrates the common symptoms of COVID-19 as stated by the students.

159 (62.8%) students hold the view that contracting COVID-19 is hazardous, while 177 (70%) are concerned about the likelihood that they or a member of their family will become infected. 114 (45.1%) individuals believe that the media has

exaggerated the hazards of the Coronavirus. Nevertheless, 174 individuals (68.8%) hold the view that stigma is not linked to COVID-19 infection (Table 3, Figure 3).

Table 3. Perceptions of the participants about COVID-19 (n= 253)

Perceptions items	Yes		No		Not sure	
	No.	%	No.	%	No.	%
I think that infection with this COVID-19 is dangerous	159	62.8%	60	23.7%	34	13.4%
I am worried about the probability of me or one of my family getting infected with this virus	177	70.0%	68	26.9%	8	3.2%
Infection with COVID-19 is associated with stigma	32	12.6%	174	68.8%	47	18.6%
I've noticed that the media has exaggerated the dangers of the Corona virus.	114	45.1%	100	39.5%	39	15.4%

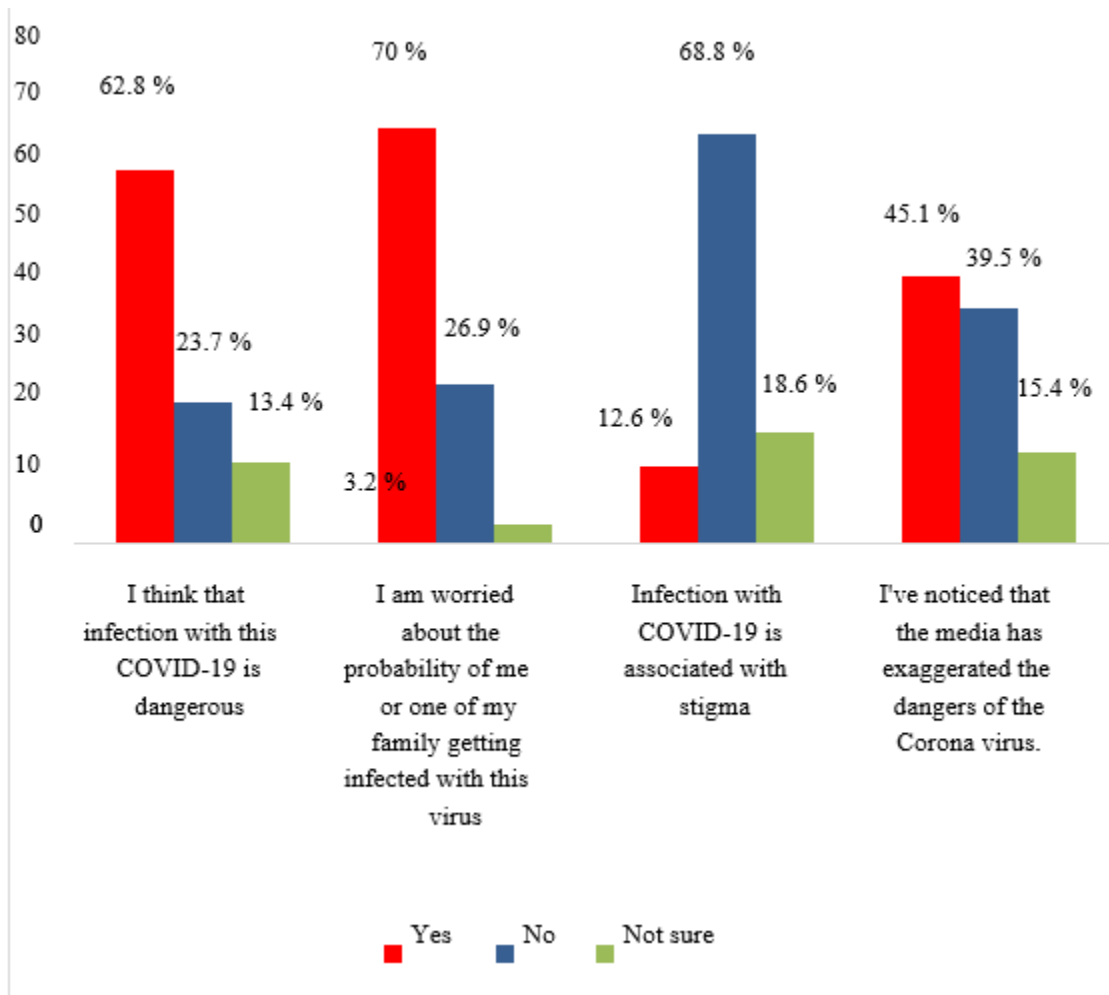


Figure 3. Bar diagram of the participants' perceptions about COVID-19

With respect to preventive measures, a mere 59 individuals (23.3%) expressed agreement with the notion of avoiding handshakes and 83 individuals (32.8%) avoided hugs. With regard to hand hygiene, 159 individuals (62.8%) ensured that they washed their hands routinely and for sufficient durations. The proportion of individuals donning face shields is 138 (54.5%). A majority of the respondents (176, or 69.2%) expressed support for attitudes that encourage individuals to report any symptoms of COVID-19 to health authorities in order to prevent its spread. Additionally, 182 individuals (71.9%) agreed with the notion of isolating oneself if in contact with an infected person. 60.1% of the 152 respondents indicated that they would utilize at-home COVID-19 tests if they were

available. A total of 97 respondents (or 38.3%) expressed agreement that they would peruse flyers or brochures containing information about the disease and adhere to the instructions provided (Table 4).

Following the calculation of the total scores for preventive practices and measures that could impede the spread of COVID-19, demographic variables were compared to the scores. Only a single statistical difference between male and female pupils was identified (P-value < 0.0001). It was observed that female pupils exhibit a greater propensity for safeguarding against the transmission of the Coronavirus compared to their male counterparts (Table 5).

## Academic Students' Awareness, Attitudes, and Preventative Measures Regarding COVID-19 in Riyadh, Saudi Arabia

**Table 4. Attitude of the participants towards the preventive measures to limit the spread of COVID-19 (n= 253)**

	Certainly No	Mostly No	Not sure	Probably Yes	Definitely Yes
	No. %	No. %	No. %	No. %	No. %
When I meet my friends and colleagues, I usually greet them with a handshake.	59 23.3%	60 23.7%	10 4.0%	58 22.9%	66 26.1%
When I meet my friends and colleagues, I usually greet them with a hug.	83 32.8%	66 26.1%	17 6.7%	54 21.3%	33 13.0%
I wash my hands regularly and for enough period of time.	23 9.1%	16 6.3%	15 5.9%	40 15.8%	159 62.8%
I usually put a face mask to protect myself from the risk of infection.	20 7.9%	31 12.3%	17 6.7%	47 18.6%	138 54.5%
If I found out that I contacted a person infected with the virus, I will inform the health authorities.	24 9.5%	26 10.3%	25 9.9%	44 17.4%	134 53.0%
If I have any of the symptoms associated with the disease, I will inform the health authorities.	22 8.7%	12 4.7%	15 5.9%	29 11.5%	175 69.2%
If I found out that I contacted a person infected with the virus, I agree to be isolated at home for a certain period of time until it is proven that I am free from the disease.	25 9.9%	7 2.8%	14 5.5%	25 9.9%	182 71.9%
If I found that I contacted a person infected with the virus, I agree to be isolated at an isolation hospital for a certain period of time until it is proven that I am free from the disease.	33 13.0%	30 11.9%	28 11.1%	40 15.8%	122 48.2%
If there is an available home test for the detection of COVID-19, I am willing to do it.	23 9.1%	13 5.1%	18 7.1%	47 18.6%	152 60.1%
I usually follow the updates about the spread of the virus in my country.	36 14.2%	42 16.6%	23 9.1%	59 23.3%	93 36.8%
I usually follow the updates about the spread of the virus worldwide	40 15.8%	43 17.0%	37 14.6%	68 26.9%	65 25.7%
If a lecture about the virus is organized either online or offline, I am willing to attend it.	64 25.3%	59 23.3%	43 17.0%	46 18.2%	41 16.2%
If flyers or brochures that include information about the disease are distributed, I will read them and follow the instructions mentioned in them.	34 13.4%	40 15.8%	31 12.3%	51 20.2%	97 38.3%



## Academic Students' Awareness, Attitudes, and Preventative Measures Regarding COVID-19 in Riyadh, Saudi Arabia

**Table 5. Comparison total score of preventive measures and practices that could limit the spread of COVID-19 with respect to demographic characteristic variables.**

		N	Mean	Std. Deviation	Minimum	Maximum	P-value
Age group	Low - 15 y	105	47.762	11.444	13.0	65.0	0.608
	16 - 18 y	148	47.007	11.565	13.0	65.0	
Sex	Male	119	44.538	11.727	13.0	65.0	< 0.0001
	Female	134	49.791	10.743	13.0	65.0	
Region of Residence	South of Riyadh	25	47.720	11.831	16.0	65.0	0.780
	North of Riyadh	80	47.575	10.085	13.0	63.0	
	East of Riyadh	117	46.906	13.054	13.0	65.0	
	West of Riyadh	12	44.75	8.688	25.0	55.0	
	Middle of Riyadh	19	49.895	7.788	39.0	61.0	
Level of school studying	Intermediate school	107	47.579	11.627	13.0	65.0	0.759
	Secondary school	146	47.130	11.439	13.0	65.0	
Do you have any medical conditions?	Yes	44	48.136	10.487	16.0	60.0	0.605
	No	209	47.148	11.716	13.0	65.0	
Have you got infected with COVID -19?	Yes	108	47.019	11.962	13.0	65.0	0.720
	No	145	47.545	11.177	13.0	65.0	

When queried about the sources of information pertaining to COVID-19, the majority of the students (235, or 92.9%) cited

social media platforms as their primary source, followed by television (150, or 59.3%) and family & friends (181 or 71.1%).

**Table 6. Binary logistic regression of influence of age, sex, area of residence, education, chronic medical condition and past infection with COVID -19 on the participants Knowledge towards COVID -19**

Variables	Inadequate(< median) 96 (37.9%)	Adequate(≥ median) 157 (62.1%)	Unadjusted		adjusted	
			OR (95% CI)	P-value	OR (95% CI)	P-value
<b>Age</b>						
11-15	40 (38.1)	65 (61.9)	Reference	0.96	0.306 (0.092-1.024)*	0.05
16-18	56 (37.8)	92 (62.2)	1.011 (0.604-1.692)			
<b>Sex</b>						
Female	50 (37.3)	84 (62.7)	Reference	0.98	0.978 (0.575-1.665)	0.93
Male	46 (38.7)	73 (61.3)	0.945 (0.568-1.571)			

## Academic Students' Awareness, Attitudes, and Preventative Measures Regarding COVID-19 in Riyadh, Saudi Arabia

Area of residence						
North of Riyadh	29 (36.3)	51 (63.8)	Reference	0.70	1.189 (0.659-	0.56
Not North of Riyadh	67 (38.7)	106 (61.2)	0.900 (0.520-1.558)		2.144)	
School Level						
Intermediate	45 (42.1)	62 (57.9)	Reference	0.24	0.243 (0.072-	0.02
Secondary school	51 (34.9)	95 (65.1)	1.352 (0.810-2.258)		0.819)*	
Father education						
Below Univercity	34 (40.0)	51 (60.0)	Reference	0.63	0.814 (0.445-	
Univesity	62 (36.9)	106 (63.1)	1.146 (0.667-1.947)		1.487)	0.50
Mother education						
Below Univesity	44 (38.6)	70 (61.4)	Reference		1.094 (0.617-	
Univercity	52 (37.4)	87 (62.6)	1.052 (0.631-1.751)	0.84	1.941)	0.75
Medical Conditions						
NO	80 (37.7)	132 (62.3)	Reference	0.87	0.971 (0.481-	0.93
YES	16 (39.0)	25 (61.0)	0.947 (0.477-1.881)		1.962)	
COVID 19 Infection						
NO	57 (39.3)	88 (60.7)	Reference	0.60	0.824 (0.485-	0.47
YES	39 (36.1)	69 (63.9)	1.352 (0.810-2.258)		1.400) p.475	

\*= statistically significant, OR= odds ratio, CI= confidence interval

There was no significant difference in the median knowledge scores among the different groups, as indicated by the unadjusted OR (95%CI). The impact of various demographic factors (age, sex, place of residence, education, chronic medical conditions, and previous Covid-19 infection) on the participants' knowledge of the virus was examined using binary logistic regressions. High knowledge scores were predicted by only two groups after adjustment (older versus younger OR=0.306, 95%CI: (0.092-1.024),  $p<0.05$ ; secondary school students versus intermediate school students OR=0.243, 95%CI: (0.072-0.819),  $p<0.02$ ; Table 6).

#### 4. DISCUSSION

Since the identification of the COVID-19 pandemic, increasing public awareness of this contagious virus has been the primary method for containing its spread (Alshammari et al., 2020). As a result, preventative measures are indispensable for reducing infection rates and halting the spread of disease. As indicated by their knowledge, attitudes, and behaviors, public compliance with preventive and control measures is crucial, as demonstrated by this result. A high proportion of the participants (91.3%) in this study possessed a considerable understanding of the disease's transmission routes, including the potential transfer from asymptomatic infected individuals and the dissemination of the virus via contaminated surfaces and droplets. The results presented in this study align with the findings reported by Egypt Shehata et al. (2021), in which they illustrated a comprehensive comprehension of the process by which children transmit COVID-19. Furthermore, two prior investigations conducted among adults in Saudi Arabia yielded

comparable findings: 81.64 percent and 89.4 percent, respectively, of the sample possessed a satisfactory level of knowledge (Al-Hanawi et al., 2020; Bazaid et al., 2020).

Analogous results were documented among various elderly cohorts, with senior individuals in China, Saudi Arabia, and Malaysia exhibiting superior levels of knowledge (Azlan et al., 2020; Zhong et al., 2020; Alahdal et al., 2020). The majority of the participants in our study exhibited knowledge regarding the customary clinical manifestations of COVID-19. Specifically, 94.5%, 92.5%, and 87.7% of the population identified fever, loss of taste and scent, and headache as the three most prominent symptoms, respectively. On the contrary, 36.8% of the participants hold the belief that diarrhea is a symptom associated with COVID-19. The findings of this research align with those of a study carried out in Egypt, which similarly observed a dearth of understanding concerning diarrhea as a clinical manifestation of COVID-19 (Shehata et al., 2021). (Salameh et al., 2021) Only 51.9% of Palestinian university students were aware that diarrhea could be one of the manifestations of COVID-19 infection. Furthermore, it is worth noting that a mere 8.3% of the participants in our study reported skin rash as one of the clinical symptoms, despite its recent inclusion as a symptom of COVID-19 (Organization WH, 2020b). A study conducted in Saudi Arabia revealed that 63 percent of the participants in the research excluded skin rash as a symptom of COVID-19 (Alahdal et al., 2020).

In this research, with respect to awareness of preventive measures, 98.4% of the students surveyed agreed that hand hygiene is critical in averting the transmission of the COVID-19 virus. Additionally, 97.2% and 95.7% of the respondents

## Academic Students' Awareness, Attitudes, and Preventative Measures Regarding COVID-19 in Riyadh, Saudi Arabia

were cognizant of the importance of donning a face mask and maintaining an appropriate social distance, respectively. In Egypt, an equivalent proportion of schoolchildren (97%), demonstrated a high level of knowledge as evidenced by a prevention score exceeding 50% (Shehata et al., 2021). Research conducted in Italy and Jordan similarly demonstrated adequate awareness of preventive measures (Gallè et al., 2020; Khasawneh et al., 2020). A considerable degree of knowledge regarding preventive measures was also reported in other studies (Al-Hanawi et al., 2020; Gallè et al., 2020; Khasawneh et al., 2020; Alahdal et al., 2020). Unexpectedly, approximately 13% of respondents to a Saudi Arabian study concurred that socializing with friends and family can help prevent the spread of COVID-19 (Alahdal et al., 2020). According to a survey conducted in the United States, 30.2% of respondents required education regarding COVID-19 preventative measures (Wolf et al., 2020).

Seventy percent of the students surveyed were concerned about the possibility that they or their families could contract COVID-19. An observation was similarly documented in Nepal, where a significant proportion of students voiced apprehension regarding the risk of contracting this virus (Subedi et al., 2020); a study conducted in the United States found that 24.6% of participants were similarly concerned (Wolf et al., 2020). Furthermore, in the United Arab Emirates, 92% of respondents were concerned that a member of their family might contract COVID-19, while only 63% were concerned about contracting the virus themselves (Baniyas et al., 2021). This study indicates that 62.8% of students maintain impeccable hand hygiene. Furthermore, 69.2% of respondents believed it was crucial to notify the proper medical authorities of COVID-19 symptoms in order to prevent the disease's spread. Furthermore, 70% of those pupils consented to isolating themselves whenever they came into contact with infected individuals. A greater proportion was documented among students in Egyptian schools; 97% of the participants achieved practice scores surpassing 50% (Shehata et al., 2021).

Furthermore, the majority of Nepalese schoolchildren adhere to preventative measures (Subedi et al., 2021). Conversely, a reduced proportion was observed among educational institutions in Ethiopia; specifically, 47% of the participants reported employing effective COVID-19 prevention strategies (Yesuf and Abdu, 2022). Additionally, adolescents in China were less likely to observe preventative measures. A mere 42.05% of primary school pupils reported practicing proper hand hygiene; among females, adherence was 1.12 times greater than that of boys. Moreover, a mere 32.47% adhered to the correct usage of a face mask (Chen et al., 2020). Similarly, females were considerably more inclined than males to adhere to preventative measures. This result was also documented in a number of additional adult studies. In the investigations by Al-

Rawajfah et al. (2021) and Bazaid et al. (2020), females exhibited a higher propensity for adhering to preventive practices compared to males.

Multiple studies have documented that the majority of respondents in this research accessed information about COVID-19 primarily through social media platforms (Yesuf and Abdu, 2022; Hager et al., 2020; Sharma et al., 2021; Xu et al., 2020). On the contrary, social media was found to be the domain in which individuals had the least faith, according to a study (Salameh et al., 2021). During the initial stages of the pandemic, the health authority devised suitable mitigation strategies to bridge the divide between public perceptions of COVID-19's seriousness, benefits and motivation, susceptibility, and barriers. The present study effectively demonstrated this through the participants' elevated level of knowledge, optimistic outlook, and adherence to prudent precautions and practices concerning COVID-19 (Alshammari et al., 2021; Alshammari et al., 2022b).

Additionally, the results of logistic regression indicated that elevated levels of student knowledge were predicted by higher grades and age. This conclusion is logical given that children gain knowledge of strategies to prevent and reduce COVID-19 cases as they advance in age and educational attainment. The authority created a total of 19 online applications for public use as a result of their endeavors (Hassounah et al., 2020). Moreover, a custom-built "Madrasati" ("My School") platform enabled Saudi Arabia's six million students to access distance education (virtual school experience) the day following the closure of schools due to the COVID-19 pandemic, as a result of previous investments in distance education. Blom et al. (2022) found that students' digital literacy, capacity for autonomous study, and aptitude for critical thought all improved.

### LIMITATIONS OF THE STUDY

Due to the fact that the study's findings were derived from a singular geographic region, they are not applicable to schools in other regions of the nation. We relied on the self-reporting of participants regarding their implementation of preventive measures; these accounts were not independently verified. An additional potential limitation is recalling bias.

### 5. CONCLUSION

Regarding COVID-19, the majority of participants in this study exhibited a high level of knowledge, a positive attitude, and sound precautions and practices. The fact that social media platforms were the primary source of information regarding COVID-19 for the majority of our study's participants demonstrates the positive influence social media platforms have on public health awareness. It is possible that our study does not represent the knowledge, attitudes, and preventive behaviors of

## Academic Students' Awareness, Attitudes, and Preventative Measures Regarding COVID-19 in Riyadh, Saudi Arabia

all Riyadh schoolchildren regarding COVID-19. Nonetheless, it offers valuable and practical insights that can assist health organizations in the development and execution of preventive initiatives.

### REFERENCES

- I. Abdelhafiz AS, Mohammed Z, Ibrahim ME, Ziady HH, Alorabi M, Ayyad M, Sultan EA. Knowledge, Perceptions, and Attitude of Egyptians Towards the Novel Coronavirus Disease (COVID-19). *J Community Health* 2020; 45(5):881-890. doi: 10.1007/s10900-020-00827-7
- II. Alahdal H, Basingab F, Alotaibi R. An analytical study on the awareness, attitude and practice during the COVID-19 pandemic in Riyadh, Saudi Arabia. *J Infect Public Health* 2020; 13(10):1446-1452. doi: 10.1016/j.jiph.2020.06.015
- III. Al-Hanawi MK, Angawi K, Alshareef N, Qattan AMN, Helmy HZ, Abudawood Y, Alqurashi M, Kattan WM, Kadasah NA, Chirwa GC, Alsharqi O. Knowledge, Attitude and Practice Toward COVID-19 Among the Public in the Kingdom of Saudi Arabia: A Cross-Sectional Study. *Front Public Health* 2020; 8:217. doi: 10.3389/fpubh.2020.00217
- IV. Alrashed S, Min-Allah N, Saxena A, Ali I, Mehmood R. Impact of lockdowns on the spread of COVID-19 in Saudi Arabia. *Inform Med Unlocked* 2020; 20:100420. doi: 10.1016/j.imu.2020.100420
- V. Al-Rawajfah OM, Al-Mugeed KA, Alaloul F, Al-Rajaibi HM, Al-Omari O. COVID-19 knowledge, attitude, and precautionary practices among health professional students in Oman. *Nurse Educ Pract* 2021; 52:103041. doi: 10.1016/j.nep.2021.103041
- VI. Alshammari AS, Alshammari H, Alshammari S. Factors Associated with Adherence to COVID-19 Preventive Measures Among Saudi Arabians. *Cureus* 2021; 13(4):e14623. doi: 10.7759/cureus.14623
- VII. Alshammari S, Alalshaikh N, Alhosan Z, Alghtani Y, Alkublan K, Alquhidan M. Phone consultation during COVID-19 in the outpatient clinic at King Khalid University Hospital: What can we infer from this exciting experience for future practice? *Med Sci* 2022b; 26:ms190e2271. doi: 10.54905/disssi/v26i123/ms190e2271
- VIII. Alshammari TM, Altebainawi AF, Alenzi KA. Importance of early precautionary actions in avoiding the spread of COVID-19: Saudi Arabia as an Example. *Saudi Pharm J* 2020; 28(7):898-902. doi: 10.1016/j.jsps.2020.05.005
- IX. Azlan AA, Hamzah MR, Sern TJ, Ayub SH, Mohamad E. Public knowledge, attitudes and practices towards COVID-19: A cross-sectional study in Malaysia. *Plos One* 2020; 15(5):e0233668. doi: 10.1371/journal.pone.0233668
- X. Baniyas N, Sheek-Hussein M, Al-Kaabi N, Al-Shamsi M, Al-Neyadi M, Al-Khoori R, Ajab S, Abid M, Grivna M, Abu-Zidan FM. COVID-19 knowledge, attitudes, and practices of United Arab Emirates medical and health sciences students: A cross-sectional study. *PLoS One* 2021; 16(5):e0246226. doi: 10.1371/journal.pone.0246226
- XI. Bazaid AS, Aldarhami A, Binsaleh NK, Sherwani S, Althomali OW. Knowledge and practice of personal protective measures during the COVID-19 pandemic: A cross-sectional study in Saudi Arabia. *PLoS One* 2020; 15(12):e0243695. doi: 10.1371/journal.pone.0243695
- XII. Blom A, Boni A, Gregory L. Learning from Saudi Arabia's journey to digital and distance education, Published on Education for Global Development 2022.
- XIII. Chen X, Ran L, Liu Q, Hu Q, Du X, Tan X. Hand Hygiene, Mask-Wearing Behaviors and Its Associated Factors during the COVID-19 Epidemic: A Cross-Sectional Study among Primary School Students in Wuhan, China. *Int J Environ Res Public Health* 2020; 17(8):2893. doi: 10.3390/ijerph17082893
- XIV. Gallè F, Sabella EA, Da-Molin G, De-Giglio O, Caggiano G, Di-Onofrio V, Ferracuti S, Montagna MT, Liguori G, Orsi GB, Napoli C. Understanding Knowledge and Behaviors Related to CoViD-19 Epidemic in Italian Undergraduate Students: The EPICO Study. *Int J Environ Res Public Health* 2020; 17(10):3481. doi: 10.3390/ijerph17103481
- XV. Hager E, Odetokun IA, Bolarinwa O, Zainab A, Okechukwu O, Al-Mustapha AI. Knowledge, attitude, and perceptions towards the 2019 Coronavirus Pandemic: A bi-national survey in Africa. *PLoS One* 2020; 15(7):e0236918. doi: 10.1371/journal.pone.0236918
- XVI. Hassounah M, Raheel H, Alhefzi M. Digital Response During the COVID-19 Pandemic in Saudi Arabia. *J Med Internet Res* 2020; 22(9):e19338. doi: 10.2196/19338
- XVII. Khasawneh AI, Humeidan AA, Alsulaiman JW, Bloukh S, Ramadan M, Al-Shatanawi TN, Awad HH, Hijazi WY, Al-Kammash KR, Obeidat N, Saleh T, Kheirallah KA. Medical Students and COVID-19: Knowledge, Attitudes, and Precautionary Measures. A Descriptive Study from Jordan. *Front Public Health* 2020; 8:253. doi: 10.3389/fpubh.2020.00253
- XVIII. KoSA-MoH. MOH Reports First Case of

## Academic Students' Awareness, Attitudes, and Preventative Measures Regarding COVID-19 in Riyadh, Saudi Arabia

- Coronavirus Infection 2020.
- XIX. Li JY, You Z, Wang Q, Zhou ZJ, Qiu Y, Luo R, Ge XY. The epidemic of 2019-novel-coronavirus (2019-nCoV) pneumonia and insights for emerging infectious diseases in the future. *Microbes Infect* 2020; 22(2):80-85. doi: 10.1016/j.micinf.2020.02.002
- XX. Organization WH. General's Opening Remarks at the Media Briefing on COVID-19. *World Heal Organ* 2020; 4.
- XXI. Organization WH. WHO target product profiles for COVID-19 vaccines 2020b; 3-29.
- XXII. Reuters-global-tracker C. Saudi Arabia: the latest coronavirus counts, charts and maps 2022.
- XXIII. Salameh B, Basha S, Basha W, Abdallah J. Knowledge, Perceptions, and Prevention Practices among Palestinian University Students during the COVID-19 Pandemic: A Questionnaire-Based Survey. *Inquiry* 2021; 58:469580219939 44. doi: 10.1177/0046958021993944.
- XXIV. Saudi Press Agency. Kingdom's government decides to suspend attendance at workplaces in all government agencies for period of (16) days except for health, security, military and electronic security center 2020.
- XXV. Sharma PYSK, Piyush AR, Yadav SK. Knowledge, attitude and practices regarding COVID-19 among school students of North India. *Indian J Forensic Community Med* 2021; 8:2 7-32. doi: 10.18231/j.ijfcm.2021.005
- XXVI. Shehata MA, Adel A, Armaneous AF, El-Sonbaty MM, Abdel-Atti M, El-Hariri HM, Kamel IH. Egyptian school children awareness and precautions in Covid19 pandemic: across sectional survey study. *Bull Natl Res Cent* 2021; 45(1): 39. doi: 10.1186/s42269-021-00495-0
- XXVII. Subedi D, Bhandari S, Gaire A, Kandel M, Subedi S, Karki S. Knowledge, Attitude, and Practices Associated with COVID-19 Among School Students in Bharatpur, Chitwan District of Nepal. *Int J Med Stud* 2020; 8:231–237. doi: 10.519 5/ijms.2020.66
- XXVIII. Wolf MS, Serper M, Opsasnick L, O'Connor RM, Curtis L, Benavente JY, Wismer G, Batio S, Eifler M, Zheng P, Russell A, Arvanitis M, Ladner D, Kwasny M, Persell SD, Rowe T, Linder JA, Bailey SC. Awareness, Attitudes, and Actions Related to COVID-19 Among Adults with Chronic Conditions at the Onset of the U.S. Outbreak: A Cross-sectional Survey. *Ann Intern Med* 2020; 173(2):100-109. doi: 10.7326/M20-1239
- XXIX. Xu H, Gonzalez-Mendez MJ, Guo L, Chen Q, Zheng L, Chen P, Cao X, Liu S, Sun X, Zhang S, Qiao Y. Knowledge, Awareness, and Attitudes Relating to the COVID-19 Pandemic Among Different Populations in Central China: Cross-Sectional Survey. *J Med Internet Res* 2020; 22(10):e226 28. doi: 10.2196/22628
- XXX. Yesuf M, Abdu M. Knowledge, attitude, prevention practice, and associated factors toward COVID-19 among preparatory school students in Southwest Ethiopia, 2021. *PLoS One* 2022; 17(1):e0262907. doi: 10.1371/journal.pone.02 62907
- XXXI. Zhong BL, Luo W, Li HM, Zhang QQ, Liu XG, Li WT, Li Y. Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. *Int J Biol Sci* 2020; 16(10):1745-1752. doi: 10.7150/ijbs.45221





