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Coronavirus Pandemic

The practice of COVID-19 preventive measures in Palestine on the limits of vaccine provision: a population-based study

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Abstract

Introduction: Despite discovery of effective vaccines, healthy behaviors and good practices remain the cornerstone of the prevention and control of COVID-19 and the mitigation of adverse impacts. This study aimed to assess the Palestinian population's COVID-19 prevention measures and correlate them with their knowledge, attitude, and background characteristics.

Methodology: A cross-sectional study was performed between Dec 2020 and Jan 2021 on 1,451 respondents ≥18 years via an interviewer-administered questionnaire, comprising 35 questions assessing knowledge, attitude, and practice toward COVID-19. Data were analyzed using univariate and multivariable regression analyses.

Results: Of the 1,451 respondents, 768 were females (52.9%), the mean age was 32.8 ± 13.7 years, and 161 (11.1%) reported having been infected with the coronavirus. Overall, 38.7% (95%CI: 36.2-41.2%), 23.4% (95%CI: 21.3-25.7%), and 50.2% (95%CI: 47.6-52.9%) reported good knowledge, attitude, and practice, respectively. Respondents over 50 [aOR 1.9, 95%CI: 1.3-2.8], females [aOR 1.7, 95%CI: 1.4-2.2], and people who had COVID-19 infection [aOR1.7, 95%CI: 1.2-2.5] were more likely to report good practice. Participants with good attitude were 5. times more likely to report good practice than those with poor attitude [*p*-value < 0.001, aOR 5.7, 95%CI: 3.9-8.4].

Conclusions: The knowledge, attitude, and practice of the participants are no ideal. A positive attitude is a crucial predictor of good practices for COVID-19 prevention and control. Public health interventions are essential for developing and sustaining positive attitudes and good practices and preventing misconceptions.

Key words: COVID-19; Knowledge, Attitudes; Practice; Preventive Measures; Palestine.

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Introduction

Coronavirus, first identified in China in December 2019, has spread globally and the Coronavirus disease (COVID-19) was declared a global pandemic by the World Health Organization (WHO) on March 11, 2020. As of February 8, 2021, the WHO reported more than 105 million confirmed cases of COVID-19, including about 2.3 million deaths [1]. Coronavirus has a high communicability and is primarily transmitted through person-to-person contact via respiratory droplets [2]. COVID-19 disease presentations vary from asymptomatic to severe. It is associated with a high rate of ICU admission and in-hospital mortality [3]. Most recent reports show the COVID-19 mortality rate between 5.6–20.3% [3, 4], with severely symptomatic patients having a mortality rate of 30–60% [5].

Implementing national public health policies to limit person-to-person spread and guidance on personal protective practices slows transmission. Such strategies include stay-at-home orders, business closures, prohibiting mass gatherings, the use of face coverings, and maintaining physical distance between persons [6]. In Palestine, cases rises despite government's efforts to enforce public safety laws for wearing face masks, hand washing, and social distancing. In addition, many lockdowns have been occured across the small country on different occasions to limit viral spread.

Despite the development of an effective vaccine against SARS-CoV-2, fear and concern persist across the globe due to the emergence of new variants with higher contagion and severe ilness [7–10]. In Palestine, a campaign to vaccinate health care providers has

begun, with a plan to vaccinate high-risk populations next [11].

Palestinians, like others across the globe, have been threatened by social stigma about COVID-19 infection [12]. Infected people will not share their COVID-19 diagnosis in order to avoid quarantine and continue their lives without restrictions. This impacts people's attitudes and practices and limits the identification of cases, resulting in continued viral spread. This is critical for low-and medium-income countries (LMICs), such as Palestine, which already suffer from occupation and scarcity of resources.

Learning theory suggests that adherence to COVID-19 prevention and control measures is likely influenced by knowledge, attitudes, and practices [13]. Understanding knowledge and attitudes, and identifying misconceptions within Plaestine will identify gaps and assist in the development of personalized awareness messages and help to tailor interventions [12, 14–16]. In addition, other factors such as age, gender, and education level influence people's practices [15, 17, 18].

The objectives of our study were (1) to measure the level of knowledge, attitudes, and practices of the West Bank population regarding COVID-19 control and prevention, (2) to investigate the relationship between practice and the populations' knowledge, attitudes, and demographics. Our study's findings are expected to guide the development of appropriate awareness messages and interventions to target factors affecting the prevention and control practices for COVID-19.

Methodology

Study design and population

A cross-sectional study was performed on the general population between December 2020 and January 2021. The research targeted West Bank Palestinians aged 18 years or older and residents of cities, villages, and refugee camps. We approached men and women of various ages and education levels in different locations such as homes, streets, markets, and universities. We presented detailed information on the study's background and objectives, and obtained written, verbal consent before. The voluntary nature of the study was explained and the confidentiality of their responses was assured. Public health and safety rules were considered when recruiting and interviewing, which included wearing masks, appropriate social distance, and using 70% alcohol sanitizers.

Sample size

We used the following equation to calculate the sample size needed to achieve the study objectives with sufficient statistical power:

$$n = \frac{DEFF * Np(1-p)}{\frac{d^2}{Z^2_{1-\propto/2}}(N-1)+p(1-p)}$$

The West Bank has a population of approximately 3 million [19], and was divided into the North, Middle, and South; to compare different regions, age groups, and genders. Sample size was calculated for each segment. The sample size *(n)* for each of the three parts is 384 using a population size *(N)* of one million, % frequency of the outcome factor in the population *(p)* = 50% ±5, confidence limits as 100 of % *(d)* = 5%, design effect *(DEFF)* = 1, confidence interval 95%. Hence, the minimum adequate total sample size was 1,150.

Measurement tool

The authors developed an interviewer-administered questionnaire based on a literature review of COVID-19 research [15, 17, 18, 20]. There are four main sections: sociodemographic information, knowledge, attitude, and practice regarding COVID-19 prevention measures. The sociodemographic section asked asked about age, sex, marital status, occupation, monthly income, educational level, residency, and chronic diseases. The knowledge section consisted of 11 questions about COVID-19 symptoms, incubation period, route of transmission, control and preventive measures, and treatment. Correct answers received one point, incorrect answers received zero points.

The third section consisted of 13 items examining attitudes about COVID-19 control and prevention, using a five-point Likert scale. We used the health belief model [21] subscales to explore participants' perceived susceptibility to and severity of the COVID-19, and the perceived benefits and barriers to practicing COVID-19 prevention and control measures. For each of 13 statements, respondents indicated their level of agreement, from "strongly disagree", "disagree", "undecided", "agree", or "strongly agree" 0, 1, 2, 3, and 4 points were assigned to the answers, respectively. For the negatively phrased items, scores were re-coded as 4, 3, 2, 1, and 0 for "strongly disagree", "disagree", "undecided", "agree", or "strongly agree", respectively.

The last section evaluated personal practices to prevent and control COVID-19 spread with 11 items. Questions examined attending social gatherings, going to crowded places, avoiding shaking hands, practicing social distancing, and washing hands after sneezing, coughing, and nose-blowing. One point was given for

good practice, and zero for poor practice. Respondents who had a "good practice" scored 8 or more, those with 6-7 points were considered "neutral practice", and less than 6 had a "poor practice".

The questionnaire was written in English and then translated into Arabic by two bilingual native Arabic speakers, one of whom was also a translator (non-medical background). The Arabic version was then translated back into English by a bilingual English-to-Arabic translator who spoke native Arabic. The research team compared the two English versions and made several linguistic adjustments to the Arabic version before it was finalized.

Table 1. Sociodemographic characteristics of the study respondents. (n = 1,451).

Variable	Frequency (%)
Gender	
Male	683 (52.9)
Female	768 (47.1)
Age*	
18-30	833 (57.4)
31-49	386 (26.6)
≥ 50	232 (16.0)
Marital status	
Married	694 (52.2)
Unmarried	757 (47.8)
Residency	
North	746 (51.4)
Middle	279 (19.2)
South	426 (29.4)
Education	
Diploma degree or less	566 (39.0)
Bachelor degree or more	885 (61.0)
Occupation	
Employed	736 (50.7)
Unemployed	715 (49.3)
Chronic diseases	
Yes	193 (13.3)
No	1,258 (86.7)
Infected with COVID-19	
Yes	161 (11.1)
No	1,290 (88.9)
Contact with COVID-19 patients	
Yes	638 (44.0)
No	813 (56.0)
Many cases of COVID-19 in the residential area	
Yes	859 (59.2)
No	592 (40.8)
Influenza like symptoms in the past 6 months	
Yes	591 (40.7)
No	860 (59.3)
Monthly income	
Less than 600$	307 (21.2)
600-1200$	573 (39.5)
More than 1200$	571 (38.4)

*Mean ± SD = 32.8 ± 13.7years; $: US Dollar.

The questionnaire was reviewed by three field experts and piloted on 40 persons of the study population before the actual data collection began. A few adjustments were made based on findings from the pilot. Reliability and the Cronbach's alpha for the study questionnaire was 0.810, with 0.753 for knowledge, 0.781 for attitude, and 0.758 for practice, all of which are good to excellent.

Statistical Analysis

We used the IBM SPSS Statistics for Windows, Version 20.0 (IBM Corp, Armonk, NY: IBM Corp) for statistical analyses. We used frequencies and percentages and means ± standard deviation (SD) to describe participants' characteristics. Knowledge, attitude, and practice scores have been converted into percentage scores by dividing the respondents' scores with the possible maximum scores and multiplying by 100. The cumulative score for each result was calculated based on Bloom's cut-off point [22]. Considering overall points, the level of knowledge was considered low-level (<60%; 0-6 scores), intermediate (60-80%; 7 and 8 scores), and high (80-100%; 9-11 scores). Attitude scores were categorized as positive (80-100%; 42-60 scores), neutral (60 %-80%; 32-41 scores) and negative (<60%; 0-31 scores). Subsequently, the level of practice was classified as poor (less than 60%; 0-5.9 scores), neutral (60-80%; 6-7.9 scores), and good (80- 100%; 8-11 scores). The proportion of positive attitudes, high-level knowledge, and good practices were computed, and we compared good practices between different groups using the Chi-square test. We used binary logistic regression to calculate crude, adjusted ORs (aORs) with 95% CIs to assess the independent association between good practices and knowledge and attitudes. Two-tailed $p < 0.05$ indicated statistical significance.

We obtained ethical approval from the Institutional Review Board (IRB) of An-Najah National University (ANNU) (Reference #: Med. Nov. 2020/20) This study followed national ethical standards for research and protection of human subjects.

Results

Background characteristics

Of the 1,451 respondents, 768 were females (52.9%), their mean age was 32.8 ± 13.7 years, and 757 (52.2%) were married. Most of the respondents (746; 51.4%) were living in the northern West Bank. The majority (885; 61.0%) attained bachelor's degree or above, 736 (50.7%) were employed, and 573 (39.5%) had monthly incomes between 600 and 1200 dollar.

Among all participants, 193 (13.3%) appeared to have a chronic disease. Concerning COVID-19, 161 (11.1%) said they had been infected, and 638 (44.0%) reported close contact with COVID-19 positive patients. There were 859 (59.2%) respondents living in areas where many cases have occurred, and 591 (40.7%) attested to suffering from corona-like symptoms in the last six months (Table 1)**.**

COVID-19 Knowledge and Attitudes

Knowledge and attitude results are displayed in Table 2. The majority (52.3%) were wrong about COVID-19 transmission, and 961 (66.2%) considered antibiotics a useful treatment. However, 1,321 (91.0%) knew that isolation effectively reduced the spread, and 38.7% (95%CI: 36.2-41.2%) had a high-level knowledge.

Regarding attitudes, 1,351 (93.1%) believed avoiding close contact with sick people protected them from getting COVID-19, as did the 90% who endorsed practicing physical distancing and avoiding crowded places. However, 1,171 (83.7%) considered using a face mask bothersome. In general, 23.4% (95%CI: 21.3-25.7%) had positive attitudes (Table 2).

COVID-19 Prevntive Measure Practices

The practice of preventive measures showed that 93.1% use an elbow or tissue to cover their mouth and nose to minimize the spread of the virus, and 82.4% wear masks when leaving home, although 61.4% of them reuse their mask. Overall, 50.2% (95%CI: 47.6-52.9%) demonstrated good practices (Table 3).

Factors associated with COVID-19 good prevention practices

Univariate analysis was used to assess the variables associated with COVID-19 practices. Older age, females, married, unemployed, good knowledge, and a positive attitude showed a significant relationship with good practices (p-value < 0.001).

Table 2. Participants' knowledge and attitudes regarding COVID-19 prevention and control in Palestine (n = 1,451).

Knowledge statements *(Frequency (%))*	**True**	**False**
COVID-19 viral transmission is similar to influenza virus	692 (47.7%)	759 (52.3%)
COVID-19 is the same as the Influenza virus	786 (54.2%)	665 (45.8%)
COVID-19 symptoms including fever, cough, headache, respiratory distress, etc.	889 (61.3%)	562 (38.7%)
Antibiotics are effective in treating COVID-19	490 (33.8%)	961 (66.2%)
The virus disinfection methods include alcohol-based hand washes, bleach, soapy water, etc	972 (67.0%)	479 (33.0%)
COVID-19 transmission may occur in the absence of fever	1,029 (70.9%)	422 (29.1%)
The incubation period of COVID-19 is 14 days	1,060 (73.1%)	391 (26.9%)
Everyone is susceptible to COVID-19	1,140 (78.6%)	311 (21.4%)
COVID-19 can be positive even if there are no symptoms.	1,173 (80.8%)	278 (19.2%)
Isolation is effective at reducing virus transmission	1,321 (91.0%)	130 (9.0%)
Overall Knowledge *(Frequency (%))*		
Low-level	468 (32.2%)	
Intermediate -level	422 (29.1%)	
High-level	561 (38.7%)	
Attitude statements *(Frequency (%))*	***Positive attitude***	***Negative attitude***
Using a face mask is bothersome	280 (16.3%)	1171 (83.7%)
Sanitizers are expensive	523 (36.0%)	928 (64.0%)
Masks are expensive	824 (56.8%)	627 (43.2%)
Avoid touching my face with unwashed hands protects me from getting infected with Coronavirus	1,009 (69.5%)	442 (30.5%)
I may have severe symptoms if I get the infection	1,176 (81.1%)	275 (18.9%)
Wearing face mask can protect me from getting COVID-19	1,189 (82.0%)	262 (18.0%)
Washing hands frequently with water and soap for 20 seconds with soap or using sanitizer (at least 60% alcohol) can kill the virus	1,218 (83.9%)	233 (16.1%)
Avoiding shaking hands can prevent the spread of Coronavirus	1,224 (84.4%)	227 (15.6%)
Using a mask when going to crowded areas can protect me from getting the virus	1,258 (86.7%)	193 (13.3%)
I am at risk of getting infected with the Coronavirus	1,291 (89.0%)	160 (11.0%)
Practicing physical distancing will prevent further spread of the infection	1,326 (91.4%)	125 (8.6%)
Avoiding crowded areas will protect me from getting COVID-19	1,332 (91.8%)	119 (8.2%)
Avoiding close contact with sick people may protect me from getting the disease	1,351 (93.1%)	100 (6.9%)
Over all attitude *(Frequency (%))*		
Poor	227 (15.6%)	
Neutral	884 (60.9%)	
Good	340 (23.5%)	

Table 3. Participants' practices regarding COVID-19 prevention and control in Palestine (n=1,451).

COVID-19 Practice of preventive measures *(Frequency (%))*	**Yes**	**No**
Do you cover your nose and mouth during coughing or sneezing with your elbow or a tissue?	1,351 (93.1%)	100 (6.9%)
Do you wear mask when leaving home	1,195 (82.4%)	256 (17.6%)
Do you adhere to the public safety rules enacted by the authorities?	1,146 (79.0%)	305 (21.0%)
Have you reduced your attendance at meetings, religious activities, events, and other social gatherings, or avoided crowded places?	1,128 (77%)	323 (22.3%)
Do you wash your hands with soap and water frequently for at least 20 seconds?	1,094 (75.4%)	357 (24.6%)
Do you limit contact (such as handshakes and kissing)?	1,002 (69.1%)	449 (30.9%)
If yes, do you touch the front of the mask when taking it off?	998 (68.8%)	453 (31.2%)
Do you clean and disinfect frequently touched objects and surfaces?	991 (68.3%)	460 (31.7%)
Do you practice "physical distancing" by remaining six feet/2 meters away from others most of the time?	822 (56.7%)	629 (43.3%)
Do you eat or drink in restaurants and cafes these days?	704 (48.5%)	747 (51.5%)
Do you reuse your mask?	560 (38.6%)	891 (61.4%)
Overall practice (Frequency (%))		
Poor	326 (22.5%)	
Neutral	396 (27.3%)	
Good	729 (50.2%)	

Table 4. Chi-square test of different variables associated with COVID-19 appropriate preventive practices in Palestine (n=1,451).

Variable	**Good practice**	**Poor practice**	**P-Value***
Age			
18-30	366 (43.9%)	467 (56.1%)	
31-49	221 (57.3%)	165 (42.7%)	< 0.001
≥50	142 (61.2%)	90 (38.8%)	
Gender			
Male	310 (45.4%)	373 (54.6%)	
Female	419 (54.6%)	349 (45.4%)	< 0.001
Residency			
North	354 (47.5%)	392 (52.5%)	
Middle	175 (62.7%)	104 (37.3%)	< 0.001
South	200 (46.9%)	226 (53.1%)	
Marital status			
Single	305 (43.9%)	389 (56.1%)	
Married	424 (56.0%)	333 (44.0%)	< 0.001
Education level			
Diploma degree or less	278 (49.1%)	288 (50.9%)	
Bachelor degree or more	451 (51.0%)	434 (49.0%)	0.493
Occupation			
Employed	325 (45.5%)	390 (54.5%)	
Unemployed	404 (54.9%)	332 (45.1%)	< 0.001
Monthly income			
Less than 600$	160 (52.1%)	147 (47.9%)	
6000-1,200	304 (53.1%)	269 (46.9%)	0.061
More than 1,200$	265 (46.4%)	306 (53.6%)	
Chronic diseases			
Yes	109 (56.5%)	84 (43.5%)	
No	620 (49.3%)	638 (50.7%)	0.063
Infected with COVID-19			
Yes	93 (57.8%)	68 (42.2%)	
No	636 (49.3%)	654 (50.7%)	0.043
Contact with COVID-19 patients			
Yes	304 (47.6%)	334 (52.4%)	
No	425 (52.3%)	388 (47.7%)	0.080
Many cases of COVID-19 in the residential area			
Yes	434 (50.5%)	425 (49.5%)	
No	295 (49.8%)	297 (50.2%)	0.795
Influenza or COVID-19 like symptoms (in the past 6 months)			
Yes	273 (46.2%)	318 (53.8%)	
No	456 (53.0%)	404 (47.0%)	0.011
Knowledge			
Low-level	209 (44.7%)	259 (55.3%)	
Intermediate -level	200 (47.4%)	222 (52.6%)	< 0.001
High-level	320 (57.0%)	241 (43.0%)	
Attitude			
Poor	58 (25.6%)	169 (74.4%)	
Neutral	449 (50.8%)	435 (49.2%)	< 0.001
Good	222 (65.3%)	118 (34.7%)	

*: Chi-square test; $: US Dollar.

On the other hand, living in an area where many COVID-19 cases had been diagnosed, variations in monthly income, and the having a chronic disease were not associated (*p*-value >0.05) (Table 4).

Multivariable analysis

We assessed the variables independently to predict good practices for COVID-19 prevention and control using the binary logistic regression. Respondents over 50 were nearly two times more likely to report good practices than those under 30 [*p*-value < 0.001, aOR 1.9, 95%CI: 1.3-2.8], and females were 1.7 times more likely to report good practices compared with males [*P*-value = 0.002, aOR 1.7, 95%CI: 1.4-2.2]. People with higher incomes reported good practices more than those with low incomes [*P*-value = 0.024, aOR 1.2, 95%CI: 09-1.6]. Those who had COVID-19 practiced good prevention 1.7 times more than those who did not contract the disease [*p*-value = 0.005, aOR1.7, 95%CI: 1.2-2.5]. Respondents who did not experience Influenza or COVID-like symptoms were 1.4-fold more likely to report good practices [*p*-value =0.010, aOR 1.4, 95%CI: 1.1-1.7]. Respondents who demonstrated good attitudes showed roughly six times better practices than respondents with poor attitude [*p*-value < 0.001, aOR 5.7, 95%CI: 3.9-8.4] (Table 5).

Discussion

Healthy behaviors and preventive practices are essential for controlling the spread of COVID-19, especially in LMICs like Palestine, where vaccine roleout is slow, suplies are limited, citizens report vacccine hesitency, and new strains are emerging. As to COVID-19 preventive practices, half (50.2%) reported

Table 5. Multivariable model of factors independently associated with good practice regarding COVID-19 control and preventive measures in Palestine.

	adjusted P-value	adjusted OR	95% CI
Age			
18-30†		1	
31-49	0.019	1.5	1.1-2.0
≥50	0.002	1.9	1.3-2.8
Gender			
Male†			
Female	< 0.001	1.7	1.4-2.2
Marital status			
Single†			
Married	0.365	0.9	0.7-1.2
Occupation			
Employed	< 0.001	1.6	1.3-2.1
Unemployed†			
Monthly income			
Less than 600†		1	
600-1,200	0.09	1.5	1.1-2.1
More than 1,200	0.024	1.2	0.9-1.6
Chronic diseases			
Yes	0.579	0.9	0.6-1.3
No†			
Infected with COVID-19			
Yes†			
No	0.005	1.7	1.2-2.5
Contact with COVID-19 patients			
Yes†			
No	0.114	0.8	0.7-1.1
Influenza or COVID-19 like symptoms (in the past 6 months)			
Yes†			
No	0.010	1.4	1.1-1.7
Knowledge			
Low-level†		1	
Intermediate -level	0.127	0.9	0.8-1.2
High-level	0.060	1.2	0.9-1.6
Attitude			
Poor†		1	
Neutral	< 0.001	3.1	2.2-4.3
Good	< 0.001	5.7	3.9-8.4

†: Reference group; OR: odds ratio; CI: Confidence interval; $: US Dollar.

good practices. Unfortunately, this is lower than both Syria [23] and Iran [17]. These variations may be attributed to the definition of good preventive practices or the questions used in these studies. We chose a more conservative definition of good practices (those who scored ≥ 80%) due to the serious nature of COVID-19 and that any break in preventive activities potentially leads to viral transmission. The result that 82% of respondents wear masks when they leave their homes is higher than reported in Bangladesh [16]. Moreover, though most Palestinians (93%) covers their noses and mouths with their elbows or tissues while sneezing, which is in line with the Nepalese [24], almost half still go to restaurants and cafes during the COVID-19 pandemic.

Over a third (38.7%) with high-level knowledge is consistent with the literature [17, 20]. Specifically, most (91%) knew that isolation was effectiven in reducing the viral spread is comparable with other studies [25]. More than half (61.3% and 67%) understood the symptoms of COVID-19 and disinfection procedures which is in line with other regional studies [15, 26]. Overall, 52.3% demonstrated poor knowledge about the SARS-CoV-2 transmission routes, which is lower than findings in other research [15, 27]. Unfortunately, 66.2% were mistaken about the use of antibiotics in COVID-19 care, compared with 35% of the population in Saudi-Arabia [15]. These results emphasize the need for more education on the mode of viral transmission and appropriate use of antibiotics. The belief that antibiotics are effective in COVID-19 infections is a serious problem, which can intensify antibiotic overuse and increase bacterial resistance, resulting in more severe super-infections and higher mortality rates COVID-19 [28].

Palestinians are more hopeful and confident in preventive measures than other populations [27, 29]. Roughly, 90% had a positive attitude about the importance of avoiding crowded areas, close interaction with symptomatic people, and the value of physical distancing. Most (86%) believd that face masks were essential preventive measure, although almost half found masks expensive and sanitizers costly (64%).

Our findings that women and those of moderate socioeconomic status were significantly better at practicing preventive measures than others is similar to studies in China and Saudi Arabia [15, 18]. Likewise, people over 50 demostrated better COVID-19 prevention practices than those younger, which was the the opposite of a study in Thailand [14].

Paletinians who had recovered from the SARS-Cov-2 infection practiced prevention and control measures. Those who had appropriate prevention practices reported fewer Influenza or corona symptoms. This underlines the importance of helping populations understand the importance of good prevention practices to prevent and limits the spread of other diseases. General population knowledge plays an essential role in the uptake of the practices necessary to prevent coronavirus spread, as described by various behavioral theories, including the theory of reasoned action, the theory of planned behavior, and social exchange theory [30]. In our finndings, knowledge was marginally significant in correlation with coronavirus prevention practices, as it was in the USA and Pakistan [31, 32]. In Malaysia, people with high levels of knowledge about the virus were generally positive in overcoming the pandemic [20].

In line with the literature, good practices were found to be significantly associated with positive attitudes [33, 34]. When wearing masks is considered bothersome (83.7%) and expensive (43%), adeherence to the recommendation is a concern. This could be related to an individual's socioeconomic status. Purchasing and wearing masks is likely less of a burdenn for people from higher socioeconomic backgrounds. While making masks and sanitizers accessible to everyone removes the financial barrier, it is still essential to educate the public about the importance of doing so in order to improve practices and enhance attitudes.

A key strength of this research was the use of an interviewer-based survey. Other studies [15–18, 20] have collected data through online forms. The interviewer format may have captured the opinions and practices of individuals who do not have Internet access and have been omitted from other work on these issues. In addition, our population-based analysis with a large sample size, represented all districts in the West-Bank of Palestine that were accessible to interviewers.

Some limitations should be considered when interpreting our results. First, the study is focused on the general Palestinian population in the West-Bank governorates, but not on the Gaza Strip or Palestinians beyond the Green Line because acess to these areas is restricted. Secondly, those less than 18 years of age have suffered fro COVID-19, but were excluded from the study duue to minor consent issue. Third, the COVID-19 knowledge, attitudes, and practices are self-reported. As for interview-based questionnaires, social desirability bias and interviewer bias should be considered. The use of convenience sampling may also limit the generalizability of our findings.

Conclusions

This study highlighted that COVID-19 preventive practices are not easy for Palestinians. A positive attitude is a significant predictor of good practices. Those with a higher socioeconomic level, the employed, those previously diagnosed with COVID-19, and females had more good practices. These findings offer a theoretical basis that builds on previous literature on factors influencing the prevention and control practices for COVID-19. Findings ways to improve attitudes towards COVID-19 preventive practices is important to combat the disease among Palestinians.

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Authors' Contributions

ZN and BM contributed to the concept and study methodology and supervised data collection. LB, YM, MK, and SA contributed to data collection. All authors made analysis and interpretation of findings. YM, LB, MK, SA contributed to writing of the first draft of the manuscript, and BM and ZN revised and finalized it. All authors revised the final version of the manuscript and approved its submission.

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