

Assessment of awareness and hygiene practices regarding COVID-19 among adults in Gaza, Palestine

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Abstract

Coronavirus disease 2019 (COVID-19) has spread worldwide and become an emerging life-threatening pandemic disease since 2019. This study aimed to evaluate the basic knowledge, awareness, personal hygiene and healthy practices regarding COVID-19 during its outbreak among the Palestinian population in the Gaza Strip. It is a cross-sectional survey carried out between July and August 2020 and included 458 participants, aged 18 years or older, belonging to the five Gaza Strip governorates, Palestine, with a variety of socio-economic status. Sociodemographic data and data on COVID-19 knowledge, awareness, personal hygiene and healthy practices were collected via email and social media applications (WhatsApp and Facebook) from the study participants. Statistical analyses were performed using V_r 22 of the SPSS software. Overall, the mean \pm SD age of the participants was 26.5 \pm 4.2 years. Our findings showed that most of the Gazan adults had very good knowledge regarding COVID-19 in terms of host sources, causative agents, incubation period, symptoms, transmission, treatment and prevention. Additionally, most of the participants had a high level of personal hygiene and healthy practices during the COVID-19 outbreak, where personal hygiene and healthy practices against COVID-19 was 77.4%. Furthermore, a higher educational level did not affect the quality of personal hygiene and healthy practice behaviours during the COVID-19 outbreak. Although most of the Gazans had good knowledge regarding the healthy practices, a significant percentage of the population did not practice the hygiene protocol. Despite the majority of the Gazan population having very good knowledge regarding COVID-19 and a high level of personal hygiene and healthy practices during the COVID-19 outbreak, a small proportion require education about avoiding physical contact and maintaining social distancing with others during the pandemic.

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Introduction

Infectious diseases cause a considerable threat to the human population [1]. In December 2019, a novel, enveloped, non-segmented, positive-sense RNA virus causing respiratory infections in humans was reported in people from Wuhan, China.

It was named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and the disease it causes was named coronavirus disease 2019 (COVID-19) [2,3]. Coronaviruses belong to the *Coronaviridae* family; they can infect mammals, including humans [4], and are called coronaviruses because of the presence of spikes on their surface, which resemble a crown [3].

COVID-19 has now spread worldwide and has become an emerging life-threatening pandemic disease from 2019 till the date this article is written [4,5]. The outbreak of COVID-19 was announced by the WHO as a public health emergency of international concern (PHEIC) on 30 January 2020 and a pandemic on 11 March 2020 [5,6]. Globally, rates of new COVID-19 cases and deaths have continued to grow as of 17 November 2020, with nearly 4 million new cases and 60 000 new deaths reported

around the world [7]. Cumulatively, as of 15 November 2020, 53.7 million confirmed cases and 1.3 million deaths have been registered to WHO from over 200 nations worldwide [7]. The overall mortality rate ranges from 1.4% to 7.2% [8,9].

The low pathogenicity and high transmissibility of the virus are two key specific features that distinguish it from other members of the *Coronaviridae* family, such as Middle Eastern respiratory syndrome coronavirus (MERS-CoV) and severe acute respiratory syndrome coronavirus (SARS-CoV) [10]. This disease is highly infectious, causes severe acute respiratory syndrome and its clinical symptoms include fever, dry cough, fatigue, shortness of breath, myalgia, pain in the muscles, sore throat, sputum production, abdominal pain, diarrhoea and loss of smell, with severe cases progressing to viral pneumonia and multisystem failure [11,12].

The possibility of increased severity of COVID-19 is observed in older individuals, people with chronic diseases such as diabetes mellitus and hypertension, and health-care providers [13]. The virus is transmitted from person to person through airborne respiratory droplets, close contact with or the touch of an infected person, and touching contaminated surfaces and then touching face, eyes, nose and mouth [10]. The average duration of its symptoms is 5 days and time of exposure to onset varies from 2 to 14 days [12]. Moreover, this virus can survive on surfaces for around 3 days [12,14]. In humans, COVID-19 is diagnosed through RT-PCR testing of a nasopharyngeal swab and by chest X-rays—scanning for features of pneumonia [15].

To date, there is no available treatment or vaccine for this virus infection, but it is possible to cure it with the aid of supportive therapy, and to control virus spread by social distancing, encouraging basic hand hygiene practices and the use of personal protective equipment, such as face masks, and frequent handwashing with water and soap.

It is also recommended that environmental disinfection be done using suitable sanitizers such as bleach [13]. In Palestine, the first seven cases of COVID-19 were confirmed on 5 March 2020 in Bethlehem Governorate, where the infected individuals mixed with Greek tourists who were visiting the Governorate, two of whom had been confirmed to be infected with the coronavirus. As for the Gaza Strip, the first case was diagnosed in Gaza on 21 March 2020 [16].

Since the first COVID-19 cases were diagnosed and until the date of writing the article (22 November 2020), the number of infected people has increased steadily; the Palestinian Ministry of Health has registered 84 340 total confirmed cases, 12 530 active cases and 714 reported COVID-19 deaths [17].

People's awareness of infectious diseases leads to infection prevention; furthermore, it is important to determine public awareness during an outbreak because appropriate civic

intervention during an outbreak is informed by public perception of disease transmission, vaccine availability and efficient medical treatment [18,19]. Hence, the Palestinian people need to know of COVID-19 and be aware of basic methods of prevention and additional required precautionary measures that may minimize the spread of the infection. The present study was carried out to assess the basic knowledge, awareness, personal hygiene and healthy practices levels regarding COVID-19 during the outbreak among the Palestinian population from the Gaza Strip.

Materials and methods

This study was a cross-sectional social media-based survey carried out between July and August 2020. The study included 458 general participants, aged 18 years or older, belonging to the five Gaza Strip governorates, Palestine, with varying socio-economic statuses. The convenience sampling technique was used to select these participants. EPI-INFO program version 7.2 was used to calculate the sample size for a population size of 2 000 000 with 95.0% CI, 5.0% acceptable margin of error and 50.0% response distribution based on the previous study carried out in Palestine [20].

The sample size was 385 participants from the general population. Participation in the study was voluntary and the ID details of the study participants were not collected. Consent forms were sent to all respondents before data collection to clear the purpose and significance of the research. The questionnaire consisted of 19 questions written by the research team regarding COVID-19 knowledge, awareness, personal hygiene, and healthy practices levels.

The content and structure of the questionnaire were checked by three experts in infectious and communicable diseases. Also, the validity and reliability of the questionnaire were tested by Cronbach's α test, and the reliability was good (0.88). The questionnaire consisted of three parts: (a) sociodemographic details of participants (e.g. age, gender, education level, etc.), (b) eight questions describing knowledge and awareness regarding COVID-19 (e.g. sources of knowledge regarding COVID-19, the causative agents for COVID-19, common symptoms, etc.) and (c) 11 questions concerning self-hygiene and healthy practices against COVID-19 (e.g. hand cleaning with an alcohol-based rub or soap and water, eating foods that support the immune system, etc.).

The questionnaire was edited using google doc. form and distributed via email and social media applications (WhatsApp and Facebook) to the study participants. It was not distributed by hand because of the Gaza Strip lockdown to prevent the virus from spreading. The participants were given 10 days to fill out and return the questionnaire. The overall personal hygiene

and healthy practices score was calculated based on each participant's response. Each agrees (yes) response was awarded a score of '1' and a disagree (No) response was scored as '0'.

The overall personal hygiene and healthy practices against COVID-19 of the study participants by education level were calculated on a Likert Scale by adding the sum of responses, which ranged from 1 to 11. The final scores were classified into three intervals: low (0–3.6), medium (3.61–7.3) and high (7.31–11). Statistical analyses were performed using version 22 of the SPSS software (IBM, Armonk, NY, USA). Descriptive statistical analysis (sum, frequency and percentages) and χ^2 test were carried out at 95% CI. A p value less than 0.05 for the hypothesis test was declared to be statistically significant.

Results

Sociodemographic characteristics of the study participants

A total of 458 individuals (48.5% male, 51.5% female) from the five governorates of the Gaza Strip participated in this study. Table 1 displays the distribution of study participants by sociodemographic covariates. The findings showed that the majority of the participants (n = 136; 59.4%) were between 18 and 30 years of age. Furthermore, the majority of them 181 (79.0%) were qualified to graduate and postgraduate education levels.

Regarding the inhabited governorate, this research found that 41.9% (n = 192) of participants inhabit the Gaza governorate versus 34.1% (n = 156) inhabit the Khan Younis governorate (Table 1). Nearly half of the participants (n = 258; 56.3%) reported a monthly income of less than 1000 New Israeli Shekels; only 62 (13.5%) reported earning more than 2000 New Israeli Shekels per month (Table 1). After using χ^2 test; there were statistically significant differences among the male and female groups concerning age group, inhabited governorate, marital status and monthly income (p 0.000, p 0.011, p 0.000 and p 0.000, respectively) (Table 1).

Personal knowledge and awareness levels regarding COVID-19

Concerning personal knowledge and awareness levels regarding COVID-19 among the participants, the findings of the current survey showed that around 58.0% of participants received information regarding COVID-19 through social media, 22.0% through audio-visual (AV) media, and 12.0% through health professionals; around 8.0% of them had no idea about it (Fig. 1). Approximately 80.0% of participants believed that COVID-19 could be transmitted from bats, 12.0% from camels, and 10.0% from domestic animals, and 3.0% of them had no idea about it (Fig. 2).

Most participants (95.0%) believed that the causative agent for COVID-19 was a virus, whereas 9.0% of them believed that

TABLE 1. Distribution of the participants by sociodemographic characteristics

Variables	Gender		% of total	p value
	% of male	% of female		
Age group (years)				
18–30	19.2%	40.2%	59.4%	0.000
31–40	10.0%	7.9%	17.9%	
41–50	11.8%	3.1%	14.8%	
51–60	5.2%	0.0%	5.2%	
>60	2.2%	0.4%	2.6%	
Education level				
Up to intermediate	12.7%	8.3%	21.0%	0.063
Graduate/Postgraduate	35.8%	43.2%	79.0%	
Governorate				
North Gaza	3.5%	2.2%	5.7%	0.011
Gaza	24.0%	17.9%	41.9%	
Middle zone	3.1%	0.9%	3.9%	
Khan Younis	12.2%	21.8%	34.1%	
Rafah	5.7%	8.7%	14.4%	
Marital status				
Married	35.4%	19.2%	54.6%	0.000
Single	13.1%	29.3%	42.4%	
Widowed	0.0%	1.3%	1.3%	
Divorced	0.0%	1.7%	1.7%	
Monthly income (New Israeli Shekel)				
<1000	21.0%	35.4%	56.3%	0.000
1000–2000	15.7%	14.4%	30.1%	
>2000	11.8%	1.7%	13.5%	
Total	N.	222	236	458
	—			
	%	48.5%	51.5%	100%

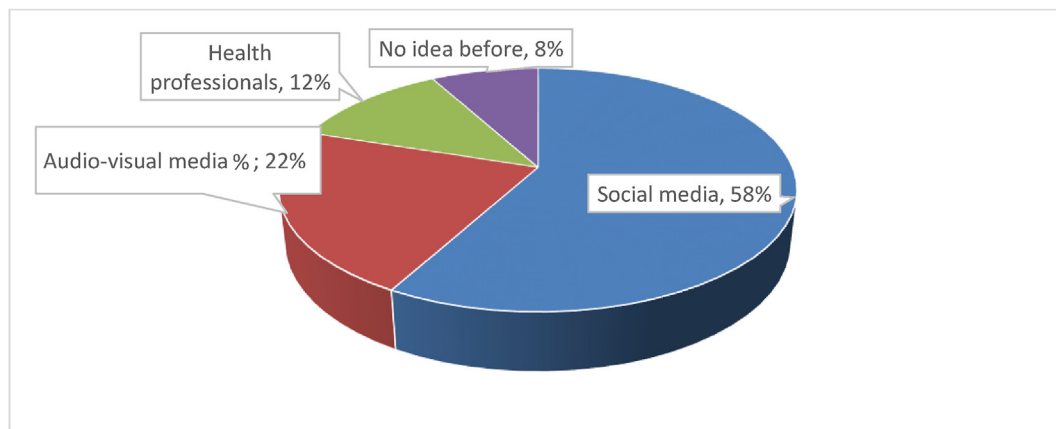


FIG. 1. Sources of knowledge regarding COVID-19.

bacteria and fungi were the causative agents, and 5.0% of them had no idea about it (Fig. 3). About 53.0% of participants knew about the incubation period of COVID-19, which is 2–14 days, whereas 37.0% of them selected for 2–21 days and 2.0% opted for 2–7 days (Fig. 4). The majority of study participants (90.0%) believed that symptoms of COVID-19 were cough and shortness of breath, 48.0% believed that fever and muscle pain were symptoms of COVID-19 and 37.0% of them opted for sore throat and runny nose (Fig. 5).

Most of the study participants (94.0%) were aware that the virus spreads by contact with COVID-19 patients, 81.0% believed the virus was airborne and 55.0% were aware that the virus can be transmitted via touching surfaces contaminated with the virus (Fig. 6). Around 60.0% of participants thought that eating immune system boosting foods was the best choice for treatment of COVID-19, whereas 26.0% of them selected plasma transfer from recovered patients, and 12.0% opted for medicinal herbs.

In contrast, 33.0% of participants believed that, to date, there was no treatment for COVID-19 (Fig. 7). Many study participants (92.0%) thought that washing hands with alcohol-based sanitizer was preventive for COVID-19, 89.0% believed that by wearing a protective mask and gloves was preventive, and 80.0% believed that avoiding contact with and social distancing from patients were significant for prevention of the spread of COVID-19 (Fig. 8).

Personal hygiene and healthy practices against COVID-19 among the participants

Our findings regarding personal hygiene and healthy practices against COVID-19 by education level are illustrated in Table 2. The majority of the study groups (about 90.0%) stated that they would stay at home if requested by the authorities. Table 2 also reveals that more than 80.0% of the respondent's answered yes to (a) eagerness for routinely cleaning and disinfecting surfaces, (b) making sure to wash hands frequently and avoiding touching

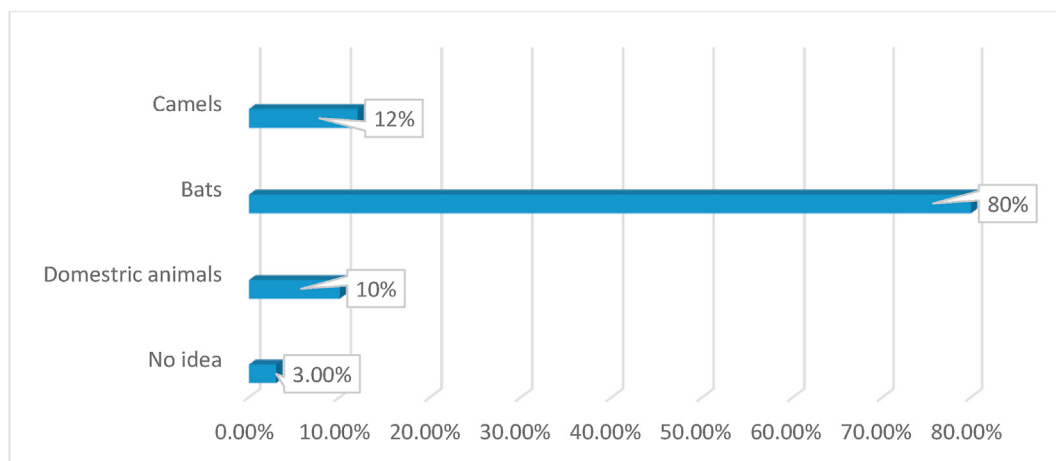


FIG. 2. Knowledge regarding host sources of COVID-19.

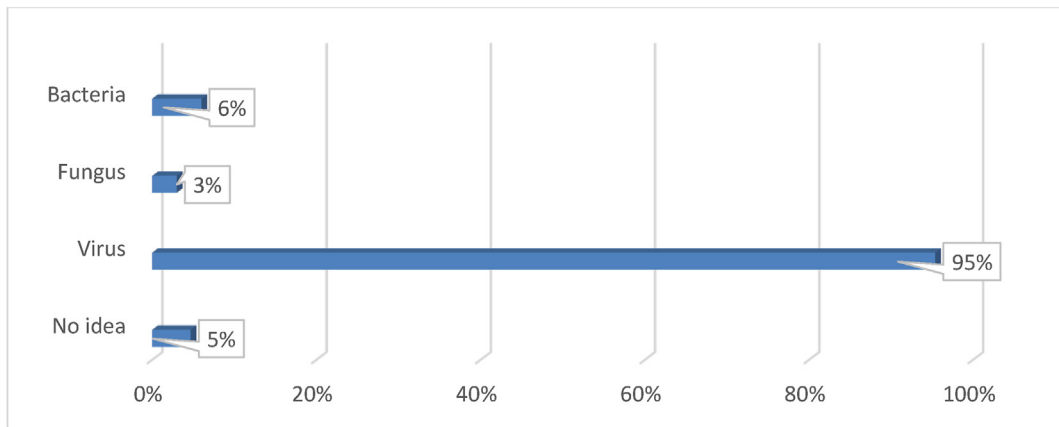


FIG. 3. Knowledge regarding the causative agents for COVID-19.

the face, (c) their interest in personal hygiene has increased during the pandemic, and (d) they are keen to adhere to the instructions of the Ministry of Health (81.2%, 80.3%, 86.5% and 86.0%, respectively).

It was reported that more than 65.0% of the study participants usually reduce the number of times they go out and take care to avoid physical contact with others (69.0% and 66.8%, respectively). However, there were no statistically significant differences among the study participants concerning personal hygiene and healthy practices by education level ($p > 0.05$) (Table 2). Also, the overall personal hygiene and healthy practices score was calculated by summation of the correct answers in the tested aspects (11 questions) and it was 8.51/11 corresponding to 77.40% of the questions were answered correctly (Table 3). Further, more than 71.6% of the participants reported high personal hygiene and healthy practices scores and only 7.0% of them had low scores (Table 4). However, there

were no statistically significant differences among the study participants concerning personal hygiene and healthy practices categories (low, medium, high) by education level ($p > 0.05$) (Table 4).

Discussion

The COVID-19 pandemic has put all countries around the world in a state of emergency because thousands of people are dying every day because of this life-threatening illness [21]. To the best of our knowledge, this study is one of the first surveys with a large sample size to be carried out to estimate the basic personal knowledge, awareness, personal hygiene, and healthy practices levels regarding COVID-19 during the outbreak among the Palestinian population from the Gaza Strip.

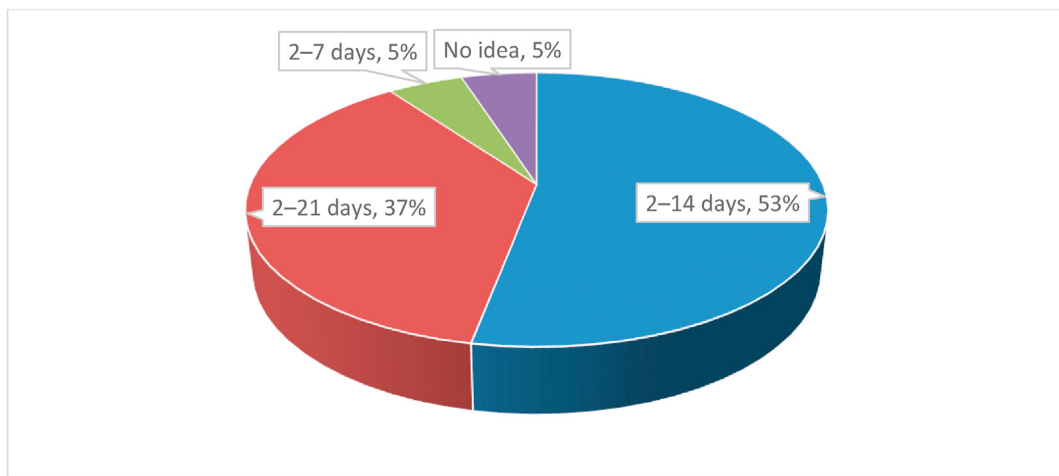


FIG. 4. Knowledge regarding the incubation period for COVID-19.

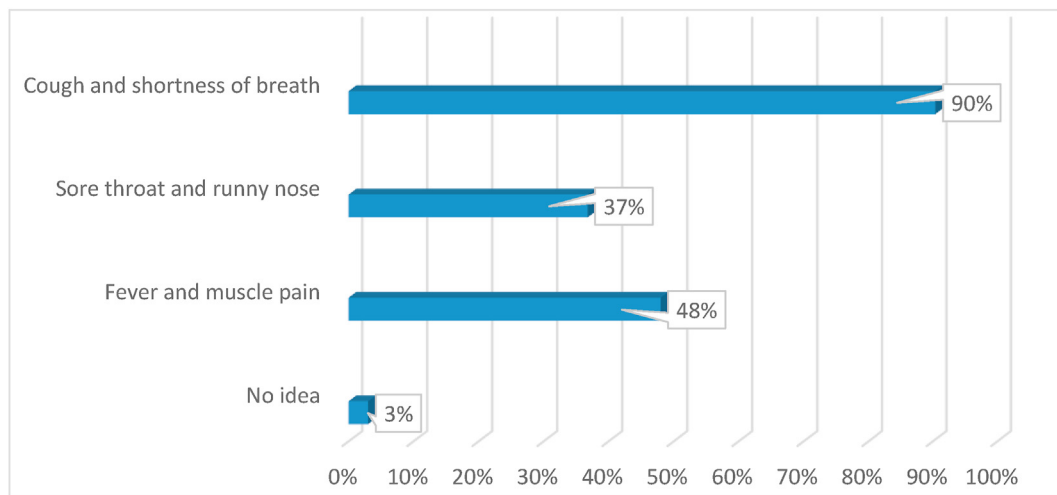


FIG. 5. Knowledge regarding the most common symptoms of COVID-19.

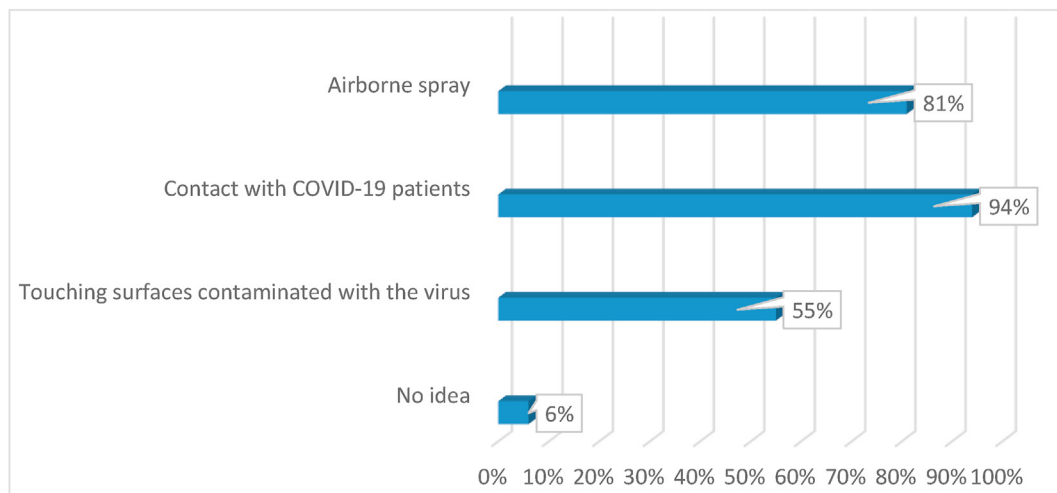


FIG. 6. Knowledge about the means of transmission for COVID-19.

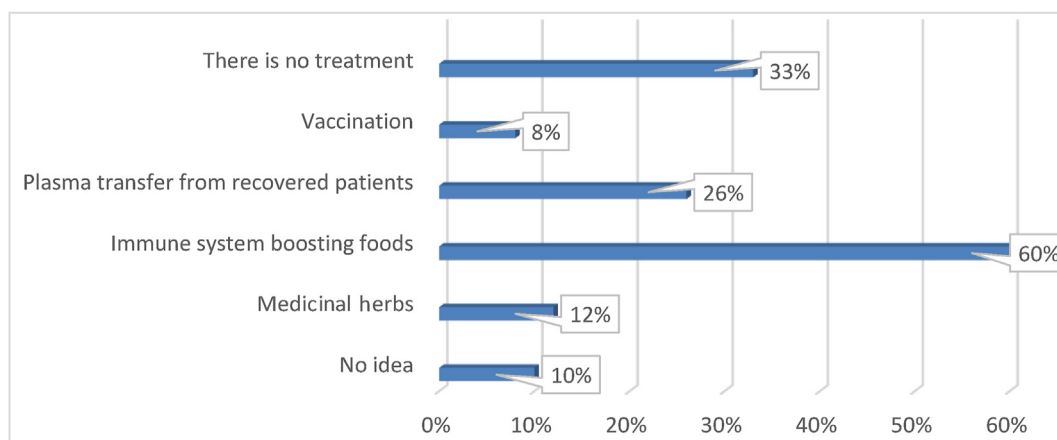


FIG. 7. Knowledge regarding the treatment of COVID-19.

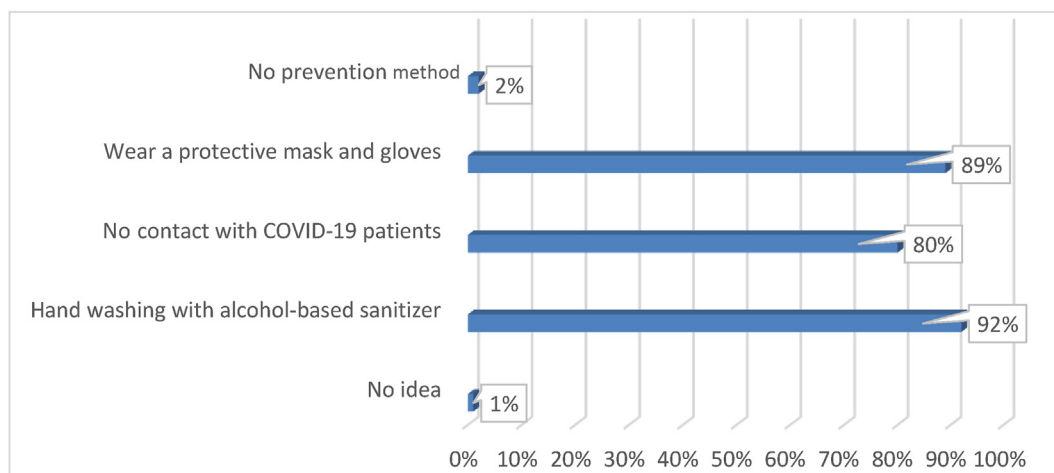


FIG. 8. Knowledge regarding the prevention of COVID-19.

TABLE 2. Personal hygiene and healthy practices against COVID-19 by education level

Variables	Education level		% of total	p value
	Up to intermediate	Graduate or above		
Usually clean hands with an alcohol-based rub or soap and water				
Yes	15.3%	58.5%	73.8%	0.876
No	5.7%	20.5%	26.2%	
The eagerness to routinely cleaning and disinfecting the surfaces in the house				
Yes	16.6%	64.6%	81.2%	0.682
No	4.4%	14.4%	18.8%	
Make sure to wash hands frequently and avoid touching the face				
Yes	16.6%	63.8%	80.3%	0.817
No	4.4%	15.3%	19.7%	
Make sure to reduce the number of times you go out				
Yes	12.2%	56.8%	69.0%	0.072
No	8.7%	22.3%	31.0%	
Your interest in personal hygiene has increased during the pandemic				
Yes	16.6%	69.9%	86.5%	0.097
No	4.4%	9.2%	13.5%	
Take care to avoid physical contact with others during the outbreak of disease				
Yes	12.7%	54.1%	66.8%	0.290
No	8.3%	24.9%	33.2%	
Be careful not to go to crowded places such as malls and markets				
Yes	14.0%	59.0%	72.9%	0.272
No	7.0%	20.1%	27.1%	
Make sure to eat foods that support the immune system				
Yes	14.8%	57.6%	72.5%	0.773
No	6.1%	21.4%	27.5%	
You are keen to use the time of your stay at home in beneficial activities (scientific, cultural, social, physical and entertainment)				
Yes	14.3%	57.6%	72.5%	0.773
No	6.1%	21.4%	27.5%	
Keen to adhere to the instructions of the Ministry of Health				
Yes	16.6%	69.4%	86.0%	0.123
No	4.4%	9.6%	14.0%	
You will stay at home if requested by the authorities				
Yes	18.3%	71.6%	90.0%	0.524
No	2.6%	7.4%	10.0%	
Total	Count	362	458	
	%	21.0%	79.0%	100.0%

Most of the participants had very good personal knowledge and awareness levels regarding COVID-19, but there were notable deficiencies in some interesting areas. The findings of the present study were in line with most recent studies conducted around the world to find out awareness levels regarding COVID-19 and reported good knowledge and awareness

among their targeted populations [10,13,22]. In contrast, Mubeen et al. reported a low-level awareness regarding COVID-19 among young adults in Karachi, Pakistan [23]. In the current survey, the level of knowledge of the respondents was below that required only regarding the incubation period of COVID-19 [23]. However, their levels of awareness relating to

TABLE 3. Overall personal hygiene and healthy practices against COVID-19

Domain	n	Mean ± SD	Percentage
Personal hygiene and healthy practices score	458	8.515 ± 2.77	77.40%

host sources, causative agents, most common symptoms, routes of infection, treatment of COVID-19, and prevention of COVID-19 were appreciably different.

The respondents good knowledge of the epidemiological situation, especially as an overwhelming majority of the respondents (79.0%) were at graduation and post-graduation education level. One of the important findings of the present study was that more than half (58.0%) of the respondents used social media as the primary source of their knowledge regarding COVID-19, followed by AV media (22.0%), like television, and the least used resource was health professionals. Similar to our findings, two studies in Pakistan and Iran targeted health-care workers and identified social media and the internet as being the most used sources of information regarding COVID-19 [6,24].

It is advisable to give more attention to prevention than to identification and response in the case of an infectious outbreak. Therefore the rapid dissemination of every new virus data is of vital importance for disease control and prevention. However, to debunk any misinformation and prevent the spread of fear and anxiety in the vulnerable population, it should be ensured that any data circulated online is accurate [23].

It is surprising to find that 33% of the participants responded that there is no treatment or vaccine availability at present. This result was similar to the results of the Al Mohaisen study, in 2017, which conducted their study among University students regarding MERS-CoV; and reported that 32.0% gave the same answer [25]. On the other hand, this result was significantly lower than the results of Mubeen et al., who conducted a study among young adults from Karachi city and found that 80.0% of participants gave the correct answer

[23]. However, it is very satisfying to find that 90.0% of the participants identified all significant symptoms of COVID-19, i.e. cough and shortness of breath. Although, cough, shortness of breath and myalgia were the most frequently registered symptoms among infected patients with COVID-19 in Wuhan, China [4].

Furthermore, the present study observed that the overall score of personal hygiene and healthy practices regarding COVID-19 was 77.4% and more than 70% (71.6%) of the participants reported high personal hygiene and healthy practices. The findings of our study were consistent with the results of the majority of studies around the world [10,13,22]. Hand hygiene has been deemed the most effective step to minimize the risk of microorganism transmission to patients [26,27], and more than 70.0% of the participants of our study usually used alcohol-based rub or soap and water to clean their hands. COVID-19 can remain on surfaces for a few hours or up to several days, based on the nature of the surface, the temperature and the humidity of the medium [6]. A majority of participants (81.2%) of our study were routinely cleaning and disinfecting the surfaces in the study.

Participants holding a graduate degree or above were not more knowledgeable compared with those with lower educational level, this could be because the disease is a global pandemic, afflicting most societies and causing home quarantine for people of all education levels, forcing them to read and learn about this novel disease. These findings were different from the results of previous studies that reported that individuals holding a postgraduate degree were more knowledgeable compared with graduates, stressing the positive impact of education on knowledge scores [10,28].

Conclusion

From the current study, it can be concluded that the majority of the Palestinian adults in the Gaza Strip have very good knowledge and awareness levels regarding COVID-19, but a small

TABLE 4. Overall personal hygiene and healthy practices against COVID-19 by education level (based on Likert scale)

Variables	Education level		% of total	p value
	Up to intermediate	Graduate or above		
Overall personal hygiene and healthy practices against COVID-19				
Low (0–3.6)	1.3%	5.7%	7.0%	0.076
Medium (3.7–7.3)	7.0%	14.4%	21.4%	
High (7.4–11)	12.7%	59.05%	71.6%	
Total	Count	96	362	
	%	21.0%	79.0%	100.0%

proportion requires education about avoiding physical contact and maintaining social distancing from others during the outbreak. Social media was the primary source of their knowledge regarding COVID-19, followed by AV media. Additionally, most of the study participants have a high level of personal hygiene and healthy practices during the COVID-19 outbreak. Higher educational level did not affect the quality of personal hygiene and healthy practice behaviours during the COVID-19 outbreak.

Recommendation

The present study highlights the deficit in public awareness for the authorities concerned, to aid them to establish more active deficit awareness campaigns. The research also highlighted the key sources (social media and AV media) from which the public takes its information that could be further used in the same population to spread awareness of infectious diseases. We recommend that social media and AV media be the main source of educating citizens about ways to prevent SARS-CoV-2 infection. Besides, extra screening studies on the same topic with a larger population are recommended.

Ethical approval

This study did not require the approval of an institutional ethics committee because it is a cross-sectional social media-based survey. Participation in the study was voluntary and consent forms were sent to all respondents before data collection to clear the purpose and significance of the research.

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Conflicts of interests

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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