# What are the behaviours toward covid-19 among the Gazan community? An online cross-sectional survey, Palestine

RESEARCH

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## A B S T R A C T

Covid-19 is one of the contagious diseases and started in December 2019, then became pandemic. The current study aimed to measure the knowledge,attitudes, and practices towards COVID-19 among the Palestinian community through online cross-sectional survey. This cross-sectional study was conducted during the period 10th of May 2020 to 28th of Sep 2020. In this survey five hundred forty subjects agreed to participate and fill the whole questionnaire. The questionnaire consisted of four main themes: 1) demographics, 2)knowledge about corona virus, 3) attitudes toward corona virus; and 4) The final section of the questionnaire assessed the participants' practices. The overall knowledge score was classified to 68.4%, 86.7% as good knowledge, and 13.3% as un-proper knowledge. The results showed that the major age of the respondents was between 18-30 years old (50.2%) while the majority of the participants were of university education level (66.3%). The total participants were 541 348 (64.3%) were females and 193 (35.7%) were males. Only 24.8% believed that they should wear a mask and/or gloves when leaving their home and 41.9% thought they should take antibiotics daily to avoid being infected. It is concluded that Palestinians had a considerable knowledge about COVID-19, and a positive attitude towards using protective measures, which is important to limit the spread of the disease and understanding the attitude of the public towards the disease.

Keywords: Covid-19, Attitude, Knowledge, Practice , Gaza, Palestine

## Introduction

Coronavirus disease 2019 (abbreviated "COVID-19") is an emerging respiratory disease that is caused by a novel coronavirus (SARS-CoV 2) and was first detected in December 2019 in Wuhan, China (Chen et al., 2020; Surveillances, 2020). COVID-19 is spread by human-to-human transmission through droplets, direct contact and possibly by other means and has an incubation period of 2-14 days. Recently there is a growing evidence of airborne transmission (WHO, 2020). On 30 January 2020, the World Health Organization (WHO) declared the COVID-19 outbreak as a public health emergency of international concern, and on March 11, the epidemic was declared a pandemic (CDC, 2020). As of October 4, 2020, 35,236,156 confirmed cases are officially reported in more than 200 countries or territories with a total of 1,039,375 deaths (Liu et al., 2020). To date, Remdesivir is the only drug that is approved by the Food and Drug Administration (FDA) for the treatment of COVID-19 (NHS, 2021) no specific antiviral treatment has been explicitly recommended for COVID-19. Therefore, applying preventive measures to control COVID-19 infection is still the most crucial intervention.

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Healthcare workers (HCWs) are the primary sector in contact with patients and are an important source of exposure to infected cases in healthcare settings (CDC, 2020; WHO, 2020). The detection of viral RNA by RT-PCR does not necessarily confirm the presence of infectious virus. It was also found that around 90% of patients with milder symptoms had a negative viral RNA test on nasopharyngeal swabs by day 10 post-onset, while the test remained positive for a longer time in all severe cases (Liu et al., 2020). This may contribute to silent transmission of the virus. COVID-19 has rapidly spread since its initial identification in Wuhan and has shown a broad spectrum of severity. Early isolation, diagnosis, and management might collectively contribute to a better control of the disease and outcome (Hussain et al., 2020).

During the course of the current outbreak, various strict measures to control transmission were put into Practice. Although the known severity of COVID-19 disease ranges from mild symptoms of upper respiratory tract infection (with or without fever) to severe pneumonia, most reported cases are at the mild end of the spectrum (Lake, 2020). The public services and facilities should provide decontaminating reagents for cleaning hands on a routine basis. Physical contact with wet and contaminated objects should be considered in dealing with the virus, especially agents such as fecal and urine samples that can potentially serve as an alternative route of transmission (Jones et al., 2020). The first two cases of COVID-19 in Gaza strip, Palestine were detected on 22nd of March 2020 involving two returnees from Pakistan. As of November, 2021 Gaza Strip has recorded 186,125 positive cases involving 1,627 deaths (WHO, 2021). Movement restrictions among other measures were enforced on 18th of March 2020 as a mitigation effort to reduce community spread and the overburdening of the country's health system. Inhabitants of Gaza strip were advised to leave the house only when necessary (basic activities such as buying groceries and seeking medical treatment). Travel outside Gaza strip was banned. Schools and universities were shifted to distance learning. Public facilities, mosques, restaurants, and parks were closed.

This study may provide baseline information to determine the type of intervention that may be required to change misconceptions about the virus and provide better insight to address poor Knowledge about the disease and the development of preventive strategies and health promotion programs. In addition, this can better prepare the government to address future health crises involving infectious diseases. The results of this study may prove useful for future efforts focusing on societal readiness to comply with pandemic control measures. The present study aimed to determine the knowledge, attitudes, and practices towards COVID-19 among the Palestinian community in Gaza Strip.

**Methods**

*Population*

This prospective cross-sectional study was conducted during the period 10th of May 2020 to 28th of Sep 2020. Residents of Gaza were invited to participate in the study through electronic mail and social media pages. An online survey was conducted, and five hundred forty (99.8%) subjects agreed to participate and filled the whole questionnaire. A total 0f 78% of the participants showed knowledge of the epidemiology of COVID-19, 37.6% know the symptoms characteristics, 65.4% know about the sources / mode of transmission, 71.0% know about the precautions and preventive strategies, 46.9% know about treatment, while 100% reported knowledge of the disease symptoms.

*Ethical considerations*

The Ethical Research Committee of the Islamic University of Gaza approved the study protocol. Participants who gave consent to willingly participate in the survey before they are starting to complete the self-administered questionnaire online. On the first page of the online questionnaire, participants were clearly informed about the background and objectives of the study. Participants were informed that they were free to withdraw at any stage, without giving a reason, and that all information and opinions provided would be anonymous and confidential. Participants who gave consent to willingly participate in the survey would click the 'Continue' button and would then be directed to complete the self-administered questionnaire.

*Study instrument*

The survey instrument is an adaptation of the measures developed in a study on Pakistani residents (Austrian et al., 2020; Khan, 2020) with modifications. The questionnaire consisted of four main themes: 1) demographics, which surveyed participant's socio-demographic information, including, age, gender, residency, education level and occupation, 2) knowledge about corona virus this section included symptoms, transmission, increased risk groups of corona virus infection, contact, and protection from coronavirus, 3) Attitudes toward corona virus; included 12 points using a five-point Likert scale. For each of 12 statements, participants were asked to state their level of agreement, from "strongly disagree," "disagree,"

"undecided," "agree," or "strongly agree." and 4) The final section of the questionnaire assessed the participants' Practices relevant to corona virus and included three questions the second one consisted of 14 points.

*Statistical analysis.*

The responses were downloaded as excel sheet. Data were analyzed using SPSS version 22. The results were presented as summary tables, charts and cross tabulation among variables. *Chi* square test was used to detect differences among respondents. *P*-value ≤ 0.05 was considered statistically significant. The score of KAP questions was calculated by gathering several

questions together for the same individual and score them.

**Results**

Demographic characteristics of the study population. A total of 540 questionnaires were completed and included in the study. The demographic data of the study participants are summarized in Table 1. The major age of the respondents was 18-30 years old (50.2%). The majority of the participants were of university education level (66.3%).
television, radio, etc.), followed by social network (Facebook, Twitter, blog, etc.). Other sources included friends or family members, medical personnel and academic training courses.

*Knowledge scores of the participants*

The cognitive information about the virus has been limited and a total mark has been determined, and the mark is decreasing according to the correctness of the information among the participants.
All participants admitted that they had heard about COVID-19, except four participants. The majority of respondents stated that their sources of knowledge were Media (newspaper,

*Awareness of COVID-19 symptoms, and contagiousness*

The responses to questions about SARS CoV-2 are displayed in Table 2. The majority of the respondents (99.6%) knew that COVID-19 is a contagious disease, and 73.3% correctly identified the need for isolation. However, only 27.4% were aware of the incubation period. 59.6% of the respondents stated that bats are the origin of this novel virus.

*Awareness, knowledge of infection prevention measures and travel recommendations*

Around two thirds of the participants knew the recommended general infection control precautions, 82.6% thought that should wash or disinfect their hands after touching the personal belongings, and 83.9% wash or disinfect their hands after shaking hands with people who are coughing and / or cold. Only 24.8% believed that they should wear a mask and / or gloves

**Table 1**: Demographic characteristics of the study participants (n = 540)

| Characteristic | | No | % |
|---|---|---|---|
| Gender | Male | 193 | 35.7 |
| | Female | 347 | 64.3 |
| Age (years old) | 18-30 | 271 | 50.2 |
| | 31-40 | 144 | 26.7 |
| | 41-50 | 68 | 12.6 |
| | 51-60 | 46 | 8.5 |
| | >60 | 11 | 2.0 |
| Residence | City | 370 | 68.5 |
| | Camp/villages | 170 | 31.5 |
| Level of education | Master's degree | 140 | 25.9 |
| | PhD or board certified | 358 | 66.3 |
| | University Level | | |
| | High school | 31 | 5.7 |
| | Graduated school | 11 | 2.0 |
| Field of study | Health Sciences | 244 | 45.2 |
| | Natural Sciences | 67 | 11.5 |
| | Social Sciences | 116 | 21.6 |
| | Religious Sciences | 35 | 6.5 |
| | Others | 85 | 15.2 |
| Occupation | Un-Employed | 96 | 17.8 |
| | Employed | 199 | 36.9 |
| | Student | 176 | 32.6 |
| | House Wife | 68 | 12.6 |

| | Question | Correct response | |
|---|---|---|---|
| | | NO | % |
| Table 2: Responses to SARS Cov-2 virus, and COVID-19 disease questions (n = 540) | - Is COVID-19 a contagious disease? | 538 | 99.6 |
| | - If a person comes in contact with corona virus patient or develop corona virus infection for how long do, we need to isolate the person? | 396 | 73.3 |
| | - How much time does it take corona virus symptoms to appear after person gets infected? | 148 | 27.4 |
| | - What is the origin of  COVID -19 disease? | 322 | 59.6 |

when leaving their home and 41.9% thought they should take antibiotics daily to avoid being infected. Regarding travel recommendations, 97.2% thought that travel should be restricted to and from areas with the diseases to avoid the spread of the disease.

*Awareness/Fear or concerns from COVID-19 pandemic*

A total of 55.6% of respondents have fears concerning their wellbeing, 83.9% have concerns towards the health and fate of their children (Table 4). The highest percentage of concern was recorded for concerns about parents and grandparents (83.9%). About half of respondents expressed their fear of losing income.
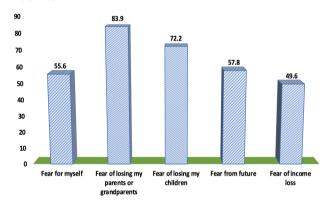


**Figure 1**: Fear or concerns from COVID-19 pandemic

Demographic variable and knowledge of COVID-19.Table 3, shows the correlation between the education level of participants' and knowledge score. knowledge decreases as age increases. There was no significant difference in the total mean knowledge score between Master's degree and PhD, University, high school, and graduated school (25.9%, 66.3%, 5.7%, and 2% respectively), ($P$=0.436) although significant variability in some knowledge aspects was noted.

**Discussion**

This study is the first epidemiological survey aimed at assessing the knowledge of individuals within Gaza strip towards the COVID-19 pandemic as well as identifying key areas of concerns and needs for optimal sub-national and community intervention. The results of this study showed that most participants had a good base of knowledge about COVID19, which is similar to other studies conducted elsewhere. The finding of a high response rate (99.8%) of COVID-19, questions may be due to the sample characteristics; 68.5% of the participants come from the cities and are therefore more likely to come from privileged groups that are more knowledgeable COVID-19, this corresponds to

**Table 3**: Correlation between Knowledge scores and Demographic characteristics

| Variable | | Total score | *P*- value |
|---|---|---|---|
| Level of education | Master's degree and PhD | 140 (25.9) | 0.436 |
| | University | 358 (66.3) | |
| | High school | 31 (5.7) | |
| | Graduated school | 11 (2) | |
| Age (years old) | 18-30 | 271 (50.2) | 0.74 |
| | 31-40 | 144(26.7) | |
| | 41-50 | 68(12.6) | |
| | 51-60 | 46(8.5) | |
| | >60 | 11(2.0) | |
| Field of study | Health sciences | 116 (21.5) | 0.001 |
| | Natural Sciences | 35 (6.5) | |
| | Social Sciences | 244 (45.3) | |
| | Religious Sciences | 62 (11.5) | |
| | Others | 82 (15.2) | |

another study conducted in the West Bank (Rugarabamu, and Byanaku, 2020; Zhong et al., 2020).

This survey was dominated by female (64.3%) respondents who are educated up to college (Bachelor) degree (48.6%) with an overall 68.4% awareness of COVID-19 thus, depicting that the respondents are knowledgeable about COVID-19 pandemic. To control for this factor, future knowledge, attitudes, and practices studies should include a greater proportion of participants from villages and camps. It is, however, noteworthy that not more than 92.2% of the participants hold a bachelor's degree or above. The strength of this study is the first published epidemiological survey aimed at assessing the knowledge of individuals within Gaza strip, which was during a peak of the COVID-19 outbreak. There was a study in Palestine, but at the national level, it included the Gaza Strip and the West Bank focusing on the variations in COVID-19 spread and control measures in the Palestinian Territories (Shaheen, and Abedrabbo, 2021) knowledge of disease symptoms measures was excellent, and the knowledge of disease recommended daily protective measures was better. The results also demonstrate that, although some variability was noted in knowledge about certain aspects of COV-19 between the groups, the total knowledge scores were different.

The total knowledge score was affected by level of education or age but does not reach the significance level (*P*-value > 0.005). Only the college type

**Table 4**: Responses to SARS, COVID-19 questions (n = 540)

|  |  | MSc. & PhD | University | High school | Grad.school | *P*-Value |
|---|---|---|---|---|---|---|
| Total Knowledge score | Good Knowledge | 122(26.1) | 313(66.9) | 24(5.1) | 9(1.9) | 0.436 |
|  | Poor Knowledge | 18(25) | 45(62.5) | 7(9.7) | 2(2.8) |  |
| Epidemiology | Good Knowledge | 136(26.4) | 339(65.8) | 29(5.6) | 11(2.1) | 0.545 |
|  | Poor Knowledge | 4(16) | 19(76) | 2(8) | 0(0) |  |
| Symptom characteristics | Good Knowledge | 39(26.5) | 97(66) | 8(5.4) | 3(2) | 0.99 |
|  | Poor Knowledge | 101(25.7) | 261(66.4) | 23(5.9) | 8(2) |  |
| Treatment | Good Knowledge | 75(29.9) | 118(63.7) | 9(3.6) | 7(2.8) | 0.039 |
|  | Poor Knowledge | 65(22.5) | 198(68.5) | 22(7.6) | 4(1.4) |  |
| precautions and preven-tive strategies | Good Knowledge | 127(26.5) | 317(66) | 26(5.4) | 10(2.1) | 0.717 |
|  | Poor Knowledge | 13(21.7) | 41(68.3) | 5(8.3) | 1(1.7) |  |
| sources and mode of transmission | Good Knowledge | 87(29.3) | 189(63.6) | 16(5.4) | 5(1.7) | 0.24 |
|  | Poor Knowledge | 53(21.8) | 169(69.5) | 15(6.5) | 6.(2.5) |  |
| Total |  | 140(25.9) | 358(66.3) | 31(5.7) | 11(2.0) |  |

significantly affected the total knowledge score (*P*-value = 0.001). Additionally, this study measured the participant's awareness towards disease aspects that are scientifically valid yet within public reach and knowledge level. The study explored new knowledge aspects, including disease epidemiology, infection sources, treatment. Our results are in accordance with previous studies (Austrian et al., 2020; Olapegba et al., 2020; WHO, 2020). However, in addition to testing more knowledge aspects, we used a multiple-choice question format and a true / false format, which may have posed some difficulty to the participants and this diversity in asking questions may explain the overall higher knowledge score observed in our sample (68.4%) compared with the findings of (Abdelhafiz et al., 2020) the mean of mean knowledge score was 16.39%. Our result was less than that reported in other studies (99.9%) (Reuben et al., 2020). Being the populous aera the Gaza Strip is home to a population of approximately 1.9 million people, including some 1.4 million Palestine refugees (Al Himdiat, 2018).

Collating such information is necessary for the promotion of major preventive behaviors including personal hygiene, social distancing as well as appraising the challenges emanating because of prolonged lockdown and restrictions. With the novelty of COVID-19 and its pathological and epidemiological uncertainties further studies and investigations are needed. In agreement with our findings, previous studies conducted in different Asian countries (Zhong et al., 2020; Azlan et al., 2020) Egypt, Kenya and Nigeria (Austrian et al., 2020; Olapegba et al., 2020; WHO, 2020) indicated high COVID-19 knowledge among the population. The high level of COVID-19 knowledge recorded in this study could be attributed to the type of respondents who participated in the survey. This has been the opposite from multiple studies published about the disease in China (Li et al., 2020; Liang et al., 2020).

**Conclusions and Recommendations**

In general, Palestinians had a considerable knowledge about COVID-19, and a positive attitude towards using protective measures, which is important to limit the spread of the disease. This knowledge is mainly acquired through Media (newspaper, television, radio, etc.), and social media. Concerned authorities need to tailor any future awareness campaigns to suite the existing knowledge of their inhabitants which can be measured through public surveillance studies.

**Ethical Approval and Consent to participate**

Ethical approval was obtained from Ethical Research Committee of the Islamic University of Gaza. Participants gave consent to willingly participate in the survey before they are starting to complete the self-administered questionnaire online.

**Availability of supporting data**

All data generated or analysed during this study are included in this article.

**Competing interest**

None

**Authors' contributions**

Abdelraouf A. Elmanama and Adnan Al-Hindi designed the study and wrote the manuscript. Mariam R. Al-

Reefi made the statistical analysis Adnan Al-Hindi provided the critical revision. All authors read and approved the final manuscript.

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