

Public's Perceptions and Knowledge Towards the 2019 Novel Coronavirus Disease (COVID-19): A Social Media Cross-Sectional Study

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Public's Perceptions and Knowledge Towards the 2019 Novel Coronavirus Disease (COVID-19): A Social Media Cross-Sectional Study

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Abstract

Background: Social media represents a rapid and impactful way to obtain and deliver information in the 21st century.

Objective: The aim was to rapidly obtain information regarding public's perceptions, knowledge and behaviors towards the novel 2019 coronavirus (COVID-19), in order to identify key areas of public education.

Methods: In a cross-sectional study design, a survey weblink was posted on the social media platforms: Instagram, Twitter and WhatsApp, by the study investigators. Participants included all users of social media, aged 18-years and above. The main outcomes measured were knowledge of symptoms of COVID-19, protective measures against COVID-19 and source(s) of information about COVID-19. Sub-group analyses were conducted examining effects of age, gender, underlying illness and working/studying in healthcare on likelihood of acquiring COVID-19 and likelihood of vaccinating against COVID-19.

Results: A total of 5,677 subjects completed the survey in 1 week. "Fever or chills" (87.6%) and "shortness of breath" (82.7%) were identified as main symptoms of COVID-19. Washing/sanitizing hands (87.9%) and avoiding public places/crowds (85.7%) were identified as most frequent protective measures against COVID-19. Social media was the most utilized source of COVID-19 information (83.5%), followed by the World Health Organization (50.1%). Subgroup analysis revealed younger subjects (age <35 years), males and those working/studying in healthcare had reported higher perceived likelihood of acquiring COVID-19, whereas older subjects, females and those in non-healthcare areas reported lower perceived likelihood of acquiring COVID-19. Similar trends were observed for vaccination against COVID-19; with older subjects, females and those in non-healthcare areas reporting lower likelihood of vaccinating against COVID-19.

Conclusions: Our results are indicative of a relatively well-informed cohort, implementing appropriate protective measures. However, key knowledge deficiencies exist with regards to vaccination against COVID-19. Future efforts should aim at correcting those.

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Original Manuscript

Original Paper**Public's Perceptions and Knowledge Towards the 2019 Novel Coronavirus Disease (COVID-19): A Social Media Cross-Sectional Study**

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Abstract

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Conclusions: Our results are indicative of a relatively well-informed cohort, implementing appropriate protective measures. However, key knowledge deficiencies exist with regards to vaccination against COVID-19. Future efforts should aim at correcting those.

Introduction

The 2019 novel, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has been at the core of a devastating 21st century pandemic. The pandemic, which originated from the Hubei Province of the People's Republic of China, has spread around the globe, claiming 512,842 lives as of July 2nd, 2020 [1,2].

The coronavirus disease 2019 (COVID-19) is predominately characterized by systemic symptoms such as fever and fatigue, and respiratory symptoms such as cough, expectoration and runny nose [3,4]. In a recent analysis examining the relationship between symptoms of COVID-19 and the severity of the disease, fatigue and expectoration were found to be the most critical positive prognostic symptoms of COVID-19 severity, whereas runny nose and nausea were favorable prognostic factors [4]. Transmission of SARS-CoV-2 occurs primarily via direct contact with respiratory droplets of infected individuals, or via indirect contact with virally-contaminated objects [5]. Increasing evidence suggests asymptomatic carriers have the ability to transmit the virus, making it ever so critical to identify and isolate these individuals effectively and rapidly [5-7]. Mortality of COVID-19 differs across countries, and has been significantly associated with age and burden of comorbidities amongst subjects, ranging from 1.9% amongst ambulatory, low-risk patients to 21.7% amongst hospitalized, higher-risk individuals [8].

To date, despite intensive medical research on the RNA virus, no treatment has been found for COVID-19, with only supportive measures being used for those who need critical care. Public preventative measures remain key for slowing down its spread. One of the most effective methods for slowing or halting the spread of COVID-19 has been social distancing, and in some instances, social isolation [9,10]. Moreover, hygienic practices such as frequent hand washing, hand sanitizing and wearing facemasks, if implemented widely and correctly, can aid in reducing the spread of virus [10]. Such simple, yet effective measures mandate powerful messages, displayed on widely viewed communication platforms, for impactful dissemination of such measures. Additionally, with the rapidly evolving situation surrounding COVID-19, speed of information dissemination is critical.

One of the fastest and most accessible platforms for broadcasting of information is social media. Social media represents a conglomerate of electronic platforms utilized for creating and sharing of information, ideas, messages and others. Such platforms include social networking websites such as Twitter, Instagram and Facebook, and messaging platforms such as WhatsApp. The latter outlets have had a major global impact, registering billions of users worldwide. Their use has extended from personal territories to organizational utilization for spread of reliable information. Such organizations include the World Health Organization (WHO) and Center of Disease Control (CDC), both posting daily updates pertaining to the current pandemic,

and each registering hundreds of thousands of followers worldwide.

The current pandemic requires not only rapidity of information spread, but also information identification and collation. The latter is essential in identifying holes and misconceptions in the public's knowledge ("fake news") and behavior towards the novel coronavirus, and seeking to correct those. Social media offers an outlet to address both. Although the utilization of such platforms as tools to undertake research is in its infancy, their speed and extensive reach adds a unique digital print to the field of cross-sectional research [11,12]. Therefore, the aim of this cross-sectional study is to examine, through several social media platforms, the public's perceptions, knowledge and behaviors towards the current COVID-19 pandemic, in order to identify those areas that could be addressed for public education and avoidance of misconceptions.

Methods

Study Population

Subject users of the social media platforms: Instagram, Twitter and WhatsApp, aged 18-years and above, were offered the survey. A web link to the survey was posted on the aforementioned social media platforms for all its adult users. The link was specifically posted on the public social media pages of the following authors: Dr. Khawla F Ali, Dr. Mohammad H Jamal and Dr. Mohamed Al-Safy. Adult subjects whom had visibility of the authors' public pages and the survey were asked to voluntarily fill in the survey. Re-sharing of the survey link by such users was permitted on any of the social media platforms for snowball sampling. The survey link was made active and available from 28th March to 4th April, 2020. The social media users of whom had the highest visibility of the public social media accounts of the above 3 authors resided predominantly in the Arabian Gulf Countries: Bahrain, Kuwait, Saudi Arabia and United Arab Emirates. The survey was administered in both English and Arabic, the two predominantly spoken languages in these countries.

Survey Administration

Our survey was composed of 13 questions. See supplementary file 1 for full list of questions. The first 7 questions addressed topics such as source(s) of information during COVID-19, viral preventative behavior(s), knowledge of symptoms of COVID-19, having acquired the infection and if "No", stating likelihood of acquiring COVID-19 in the next 3 months, and finally, likelihood of vaccinating against COVID-19. The other 6 questions pertained to subject demographics: age group, gender, educational level, country of current

residence, underlying illness(es) and if participant works/studies in the healthcare sector. The survey questions were partially adapted from a questionnaire designed and published by the “Understanding America Study”, which is maintained by the Center for Economic and Social Research at the University of Southern California [13]. The survey was designed on an online platform: Zoho Creator. Informed consent in the form of agreement to an information leaflet was obtained from all subjects prior to initiation of survey. The survey overall took less than 5 minutes to complete. The study was approved by the Research Ethics Committee at the Royal College of Surgeons in Ireland-Medical University of Bahrain.

Data Collection and Analysis

All data on personal demographics (age groups, gender, highest educational level, working/studying in healthcare sector, presence of medical comorbidities, country of current residence, and status of COVID-19 infection) were categorically expressed as percentages of total respondents. Data on source(s) of information during COVID-19, viral preventative behavior(s) and knowledge of symptoms of COVID-19 were also expressed as percentages of total respondents.

Sub-group categorical analyses were also conducted examining the effects of age (≥ 35 years versus < 35 years), gender (female versus male), underlying illness(es) (yes versus no) and status of working/studying in the healthcare industry (yes versus no) on reported likelihood of acquiring COVID-19 infection in the next 3 months, and likelihood of vaccinating against COVID-19. Results were categorically expressed as percentages of total respondents in each of the subgroups.

Patient and Public Involvement

The development of the research questions and outcomes was primarily executed by the study investigators, guided by the current body of literature, and independent of patient involvement. Patients were not involved in the design of this study. Patients’ and public’s involvement however were crucial in the recruitment phase of the study, in the format of dissemination of survey link, via snowballing effect, through their own social media accounts to others in the digital community. Post-publication, the results will be disseminated to participants on the same platforms of social media that hosted the survey link, through a short, interactive video recorded and posted by the principle investigator of the study.

Results

A total of 5,677 subjects completed the survey. Of the survey respondents, 3,945 (69.5%) were female, 3,737 (65.9%) were under the age of 35 years and the majority; 4,257 participants (75.0%) reported a higher educational degree. Amongst respondents, 1,250 (22%) reported working or studying in the healthcare industry. 4,003 (70.5%) reported no underlying illness. The majority of respondents resided in Bahrain [3,179 out of 5,677 respondents (56.0%)], Kuwait [784 out of 5,677 respondents (13.8%)] and Saudi Arabia [693 out of 5,677 respondents (12.2%)]. Only 55 respondents (1%) reported positive COVID-19 results. The remainder of baseline demographics are detailed in Table 1.

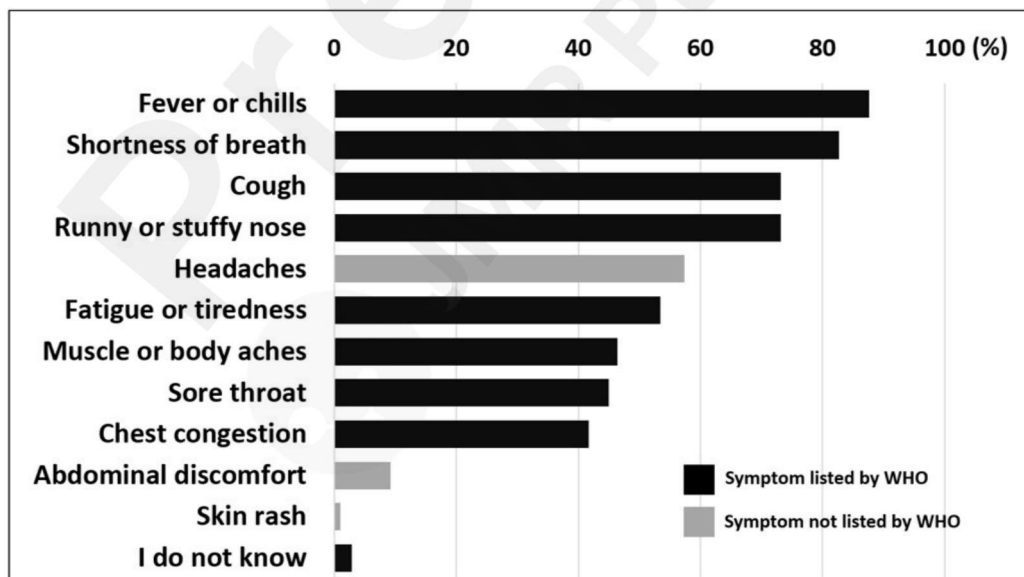
Table 1: Baseline characteristics of study population. *Percentages are of those reporting medical problems.

Characteristic	Result
Total participants, n	5,677
Female, n (%)	3,945 (69.5)
Age, n (%)	
18-24 y	1,712 (30.2)
25-34 y	2,025 (35.7)
35-44 y	1,104 (19.4)
45-54 y	534 (9.4)
55-64 y	256 (4.5)
≥65 y	46 (0.8)
Educational Status	
Primary School, n (%)	11 (0.2)
Intermediate School, n (%)	68 (1.2)
High School, n (%)	1,341 (23.6)
College/Higher Education Degree, n (%)	4,257 (75.0)
Work/study in healthcare sector	
Yes, n (%)	1,250 (22.0)
No, n (%)	4,427 (78.0)
Medical Problems	
I have no medical problems, n (%)	4,003 (70.5)
I have medical problems, n (%)	1,674 (29.5)
Type of Medical Problems*	
High blood pressure, n (%)	387 (23.1)
Diabetes, n (%)	362 (21.6)
Heart disease, n (%)	74 (4.4)
Lung disease, n (%)	198 (11.8)
Cancer, n (%)	31 (1.9)
Others, n (%)	946 (56.5)
Country/Region of Current Residence	
Bahrain, n (%)	3,179 (56.0)

Kuwait, n (%)	784 (13.8)
Saudi Arabia, n (%)	693 (12.2)
United Arab Emirates, n (%)	324 (5.7)
Oman, n (%)	232 (4.1)
Qatar, n (%)	71 (1.3)
Other Arab Countries, n (%)	166 (2.9)
Asian Countries (excluding Arab), n (%)	43 (0.8)
Europe, n (%)	118 (2.1)
North America, n (%)	58 (1.0)
South America, n (%)	2 (0)
Australia and New Zealand, n (%)	7 (0.1)
Diagnosed with COVID-19?	
Yes, n (%)	55 (1.0)
No, n (%)	5,622 (99.0)

The majority of respondents identified “fever or chills” [4,973 out of 5,677 participants (87.6%)], “shortness of breath” [4,695 out of 5,677 participants (82.7%)] and “cough” [4,150 out of 5,677 participants (73.1%)] as main symptoms of COVID-19 (Figure 1). Only 165 respondents (2.9%) reported “I do not know” when asked about main symptoms of COVID-19 (Figure 1).

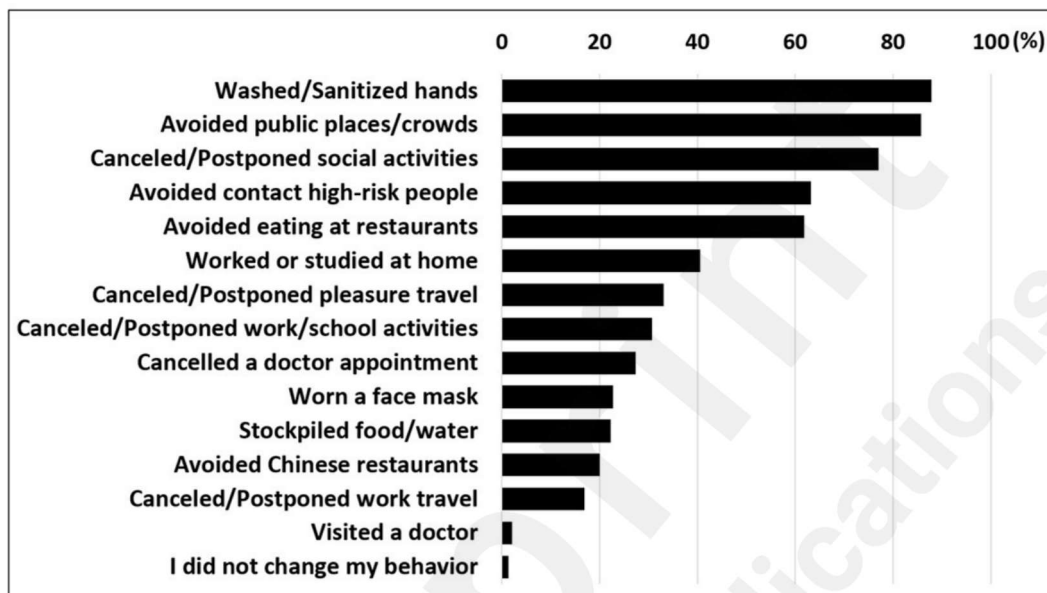
Figure 1: Knowledge about main symptoms of COVID-19 infection. Results are expressed as % of respondents. n=5,677.



The most frequently reported preventative behaviors were frequent washing/sanitizing hands [4,990 out of 5,677 participants (87.9%)], avoiding public places/crowds [4,865 out of 5,677 participants (85.7%)] and

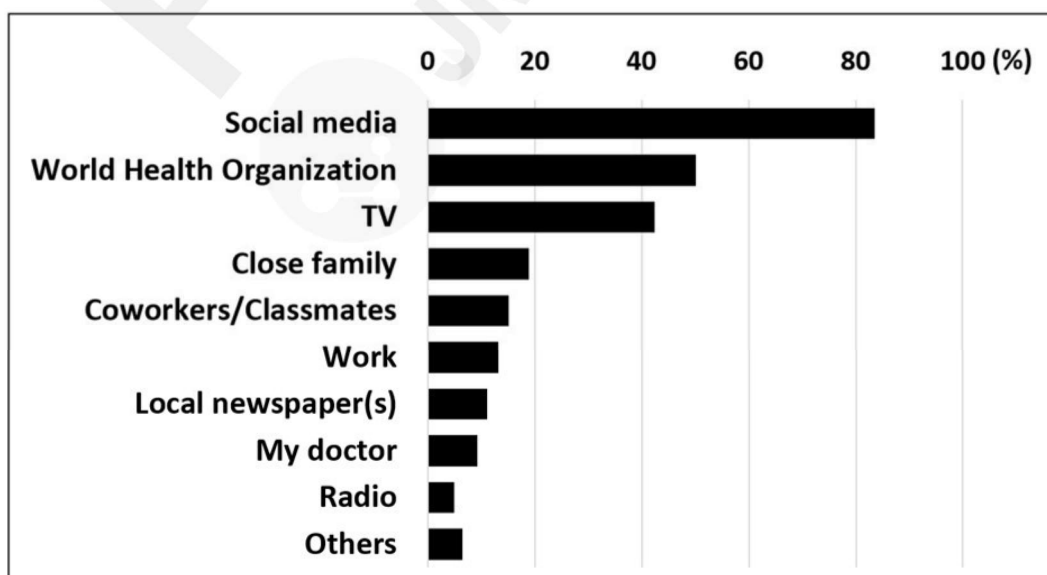
canceling/postponing social activities [4,371 out of 5,677 participants (77.0%)] (Figure 2). Only 74 subjects (1.3%) reported not changing their behavior in response to COVID-19 (Figure 2).

Figure 2: Behaviour(s) done in past week to prevent COVID-19 infection. Results are expressed as % of respondents. n=5,677.



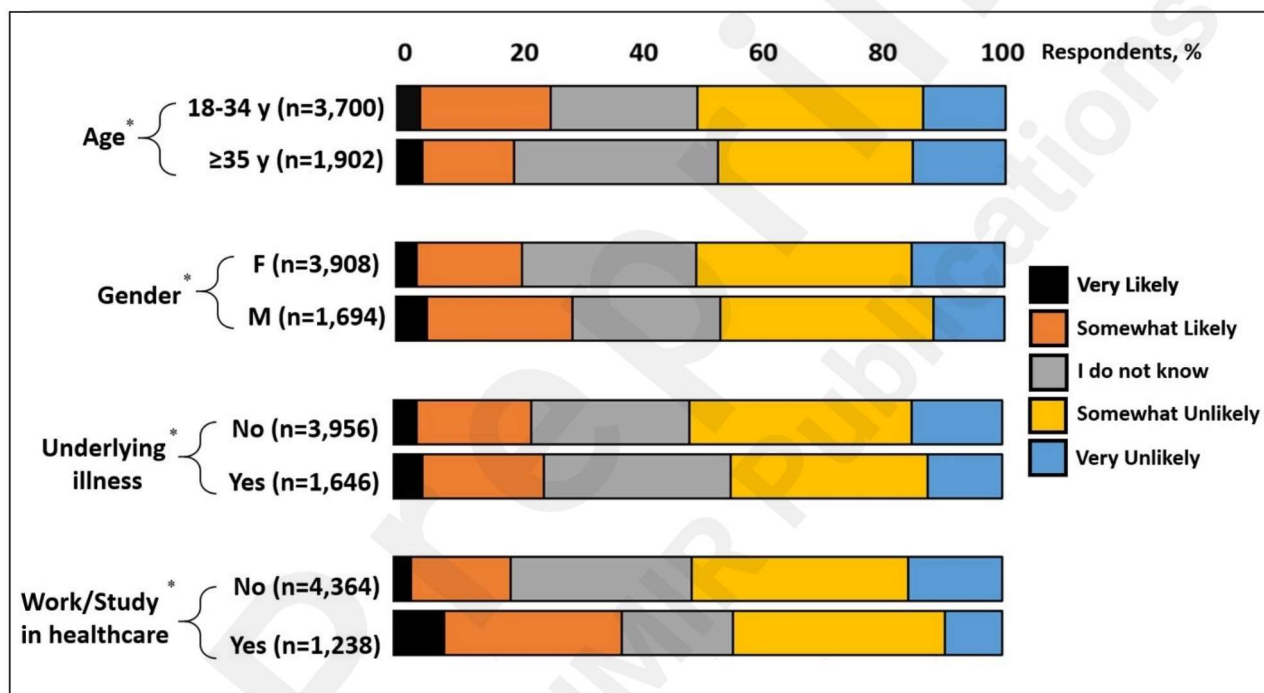
The most utilized sources of COVID-19 information were social media platforms reported in 4,740 respondents (83.5%), the WHO in 2,844 respondents (50.1%) and TV in 2,413 respondents (42.5%) (Figure 3).

Figure 3: Source(s) of COVID-19 information. Results are expressed as % of respondents. n=5,677.



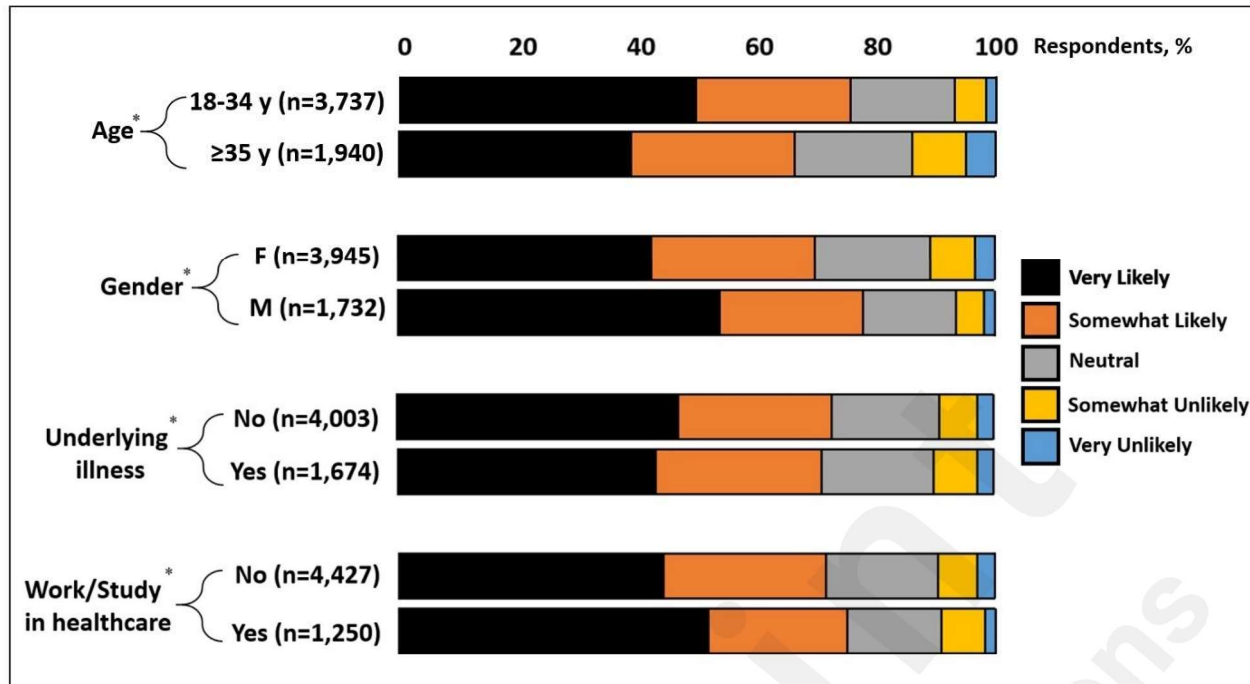
In a subgroup analysis examining the effects of age, gender, underlying illnesses and work/study in the healthcare sector on the likelihood of acquiring COVID-19 in the next 3 months, younger subjects (age <35 years), male subjects and those working/studying in healthcare reported a higher likelihood of acquiring COVID-19, expressed as “very likely” and “somewhat likely” (Figure 4).

Figure 4: Likelihood of acquiring COVID-19 infection in next 3 months. Results are categorized by age group, gender, presence of underlying illness(es) and if subject works/studies in healthcare industry. Results are expressed as % of respondents. *n=5,602 in all categories (55 subjects reporting COVID-19 infection were eliminated for this analysis, 20 subjects with no response were also eliminated).



In a secondary subgroup analysis investigating the effects of the latter on the likelihood of vaccinating against COVID-19, younger subjects (aged <35 years), male subjects and those working/studying in healthcare also reported a higher likelihood of vaccinating, expressed as “very likely” and “somewhat likely” (Figure 5).

Figure 5: Likelihood of vaccinating against COVID-19. Results are categorized by age group, gender, presence of underlying illness and if subject works/studies in healthcare industry. Results are expressed as % of respondents. *n=5,677 in each category.



Discussion

In the midst of an unprecedented global health crisis, it is critical to know if the educational messages for the prevention of COVID-19 are being delivered, understood and implemented by the public.

This survey, conducted through three social media outlets, facilitated a large and rapid collection of 5,677 responses within seven days and showed that the majority of respondents were well-aware of the symptoms of COVID-19 and the measures to prevent it, as per the WHO guidelines [14]. Additionally, a large portion of subjects (around 50%) utilized reliable sources of information such as the WHO. Such collective responses are indicative of a well-informed cohort, which may be explained by the younger, educated (75% had a higher education degree) users of social media. It is of note that a large number of these responses (56.0%) were from people in Bahrain. The spread of COVID-19 in Bahrain has been well contained at the time of survey distribution (998 cases as of April 11th) [15], and the number of fatalities (7 as of April 11th) [15] has been very low especially considering it is the 3rd most densely populated country in world. Such statistics could be due to the early and extensive communication, particularly through social media outlets [16,17], highlighting the importance of general knowledge of the virus amongst citizens and residents for the control of its spread.

Our subgroup analysis examining the effects of age (<35 versus ≥35 years old), gender, presence of underlying illnesses and work/study in healthcare revealed some intriguing findings. Younger subjects (<35

years old) reported higher likelihood of vaccinating against COVID-19 compared to the older generations. This may be a reflection of their higher perceived likelihood of acquiring COVID-19, as demonstrated in our subgroup analysis. Higher perceived likelihood of infection may be explained by higher chances of coming in contact with perceived high-risk groups as mandated by work, social or study environments. Similarly, male subjects reported a higher likelihood of acquiring the infection and vaccinating against the virus than their female counterparts. This may have been triggered by late reports from China, Italy, France, Germany and South Korea indicative of higher rates of mortality, as high as 89%, in males compared to females [18]. Infection rates, however, have not widely differed between the sexes [18]. The distinction in death rates have been hypothesized to be due to higher rates of cigarette smoking, alcohol consumption and the number of pre-existing co-morbidities amongst men compared to women [19]. Lastly, workers or learners in the healthcare sector reported higher likelihood of acquiring the infection, and higher likelihood of vaccinating, as one might expect. No major distinctions were noted amongst those with and without underlying illnesses.

Several limitations exist. A major limitation of the study is its sampling technique. Convenience sampling, typically utilized in similar cross-sectional studies, is a type of non-probability sampling that allows for data collection from a group of people easy to contact and/or reach [20]. The latter may have introduced sampling bias in our subject cohort. For instance, female and younger subjects are more likely to be represented in social media compared to their male and older counterparts [11], as was seen in our study population. Another major limitation is the susceptibility of the study to non-response bias. Our sample also had an unusually high prevalence (22%) of subjects either working or studying in the healthcare sector. This may be explained by the fact that the survey link was mostly posted on platforms managed by physicians. Such platforms would typically attract users from the same profession. Additionally, the majority of respondents resided in a confined geographical area located within the Arabian Gulf Peninsula. Thus, data may not be applicable to subjects residing elsewhere. We plan to address such limitations with future studies targeting a wider and more diverse sample of the population. Additionally, we plan to disseminate the results to study participant utilizing the same social media platforms.

Conclusions

Our results are indicative of a well-informed cohort, implementing appropriate protective measures, and with

the majority reporting social media as their main source of COVID-19 information. Such findings support social media as a potential impactful way for future collection of data and delivery of information. Understanding that there may be inherent limitations to such study design. We plan to use this platform again to determine if such changes are maintained with the continuation of the pandemic.

Acknowledgements

Khawla F. Ali designed the study, analyzed data and wrote manuscript; Simon Whitebridge designed the survey, analyzed data and edited the manuscript; Mohammad H. Jamal contributed to distribution of survey and editing of manuscript; Mohamed Al-Safy contributed to distribution of survey and editing of manuscript; and Stephen L. Atkin assisted in study design, analysis of data and writing of manuscript. All authors approved this version of the manuscript. This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors

Conflict of Interest

All authors report no financial conflicts of interests related to this work, and have nothing to disclose.

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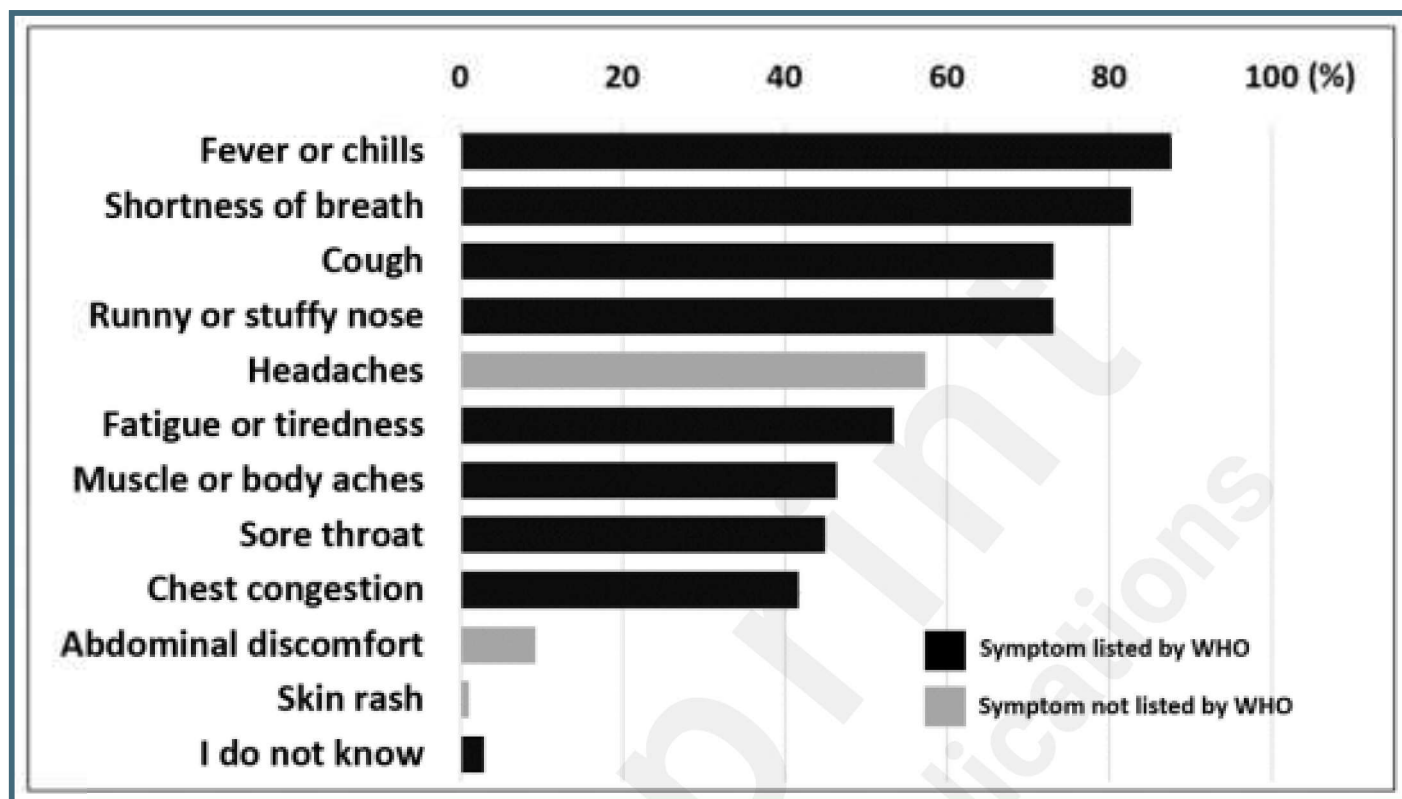
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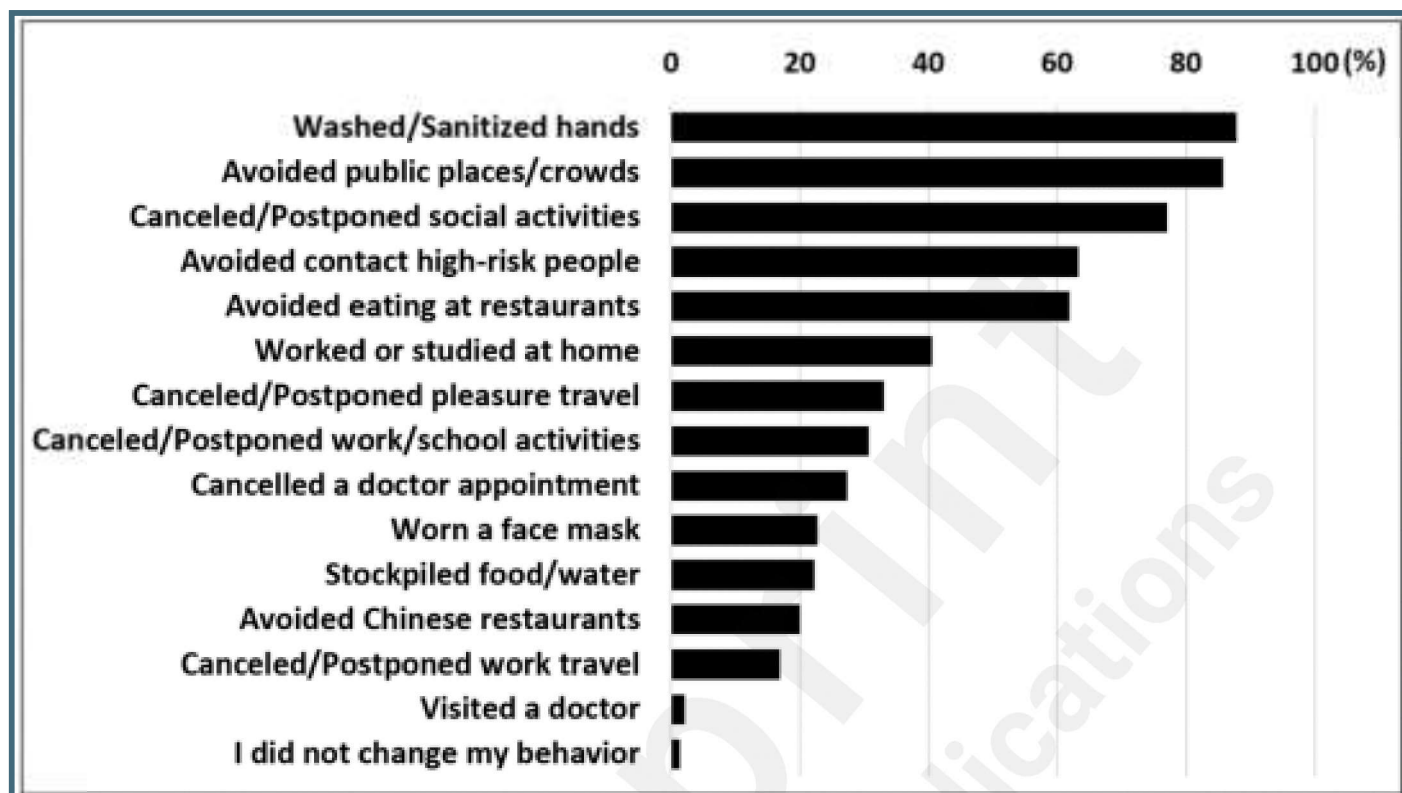
Supplementary Files

Figures

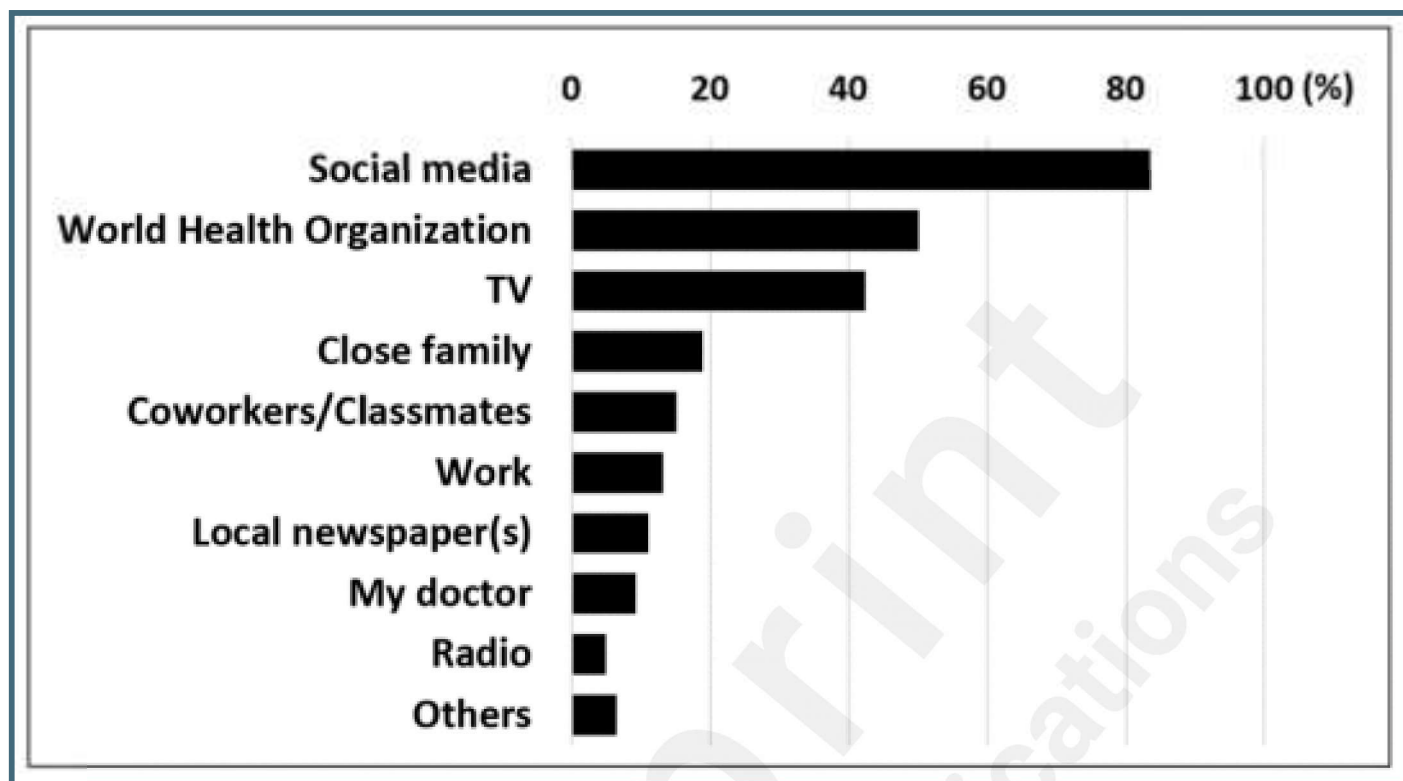
Knowledge about main symptoms of COVID-19 infection. Results are expressed as % of respondents. n=5,677.



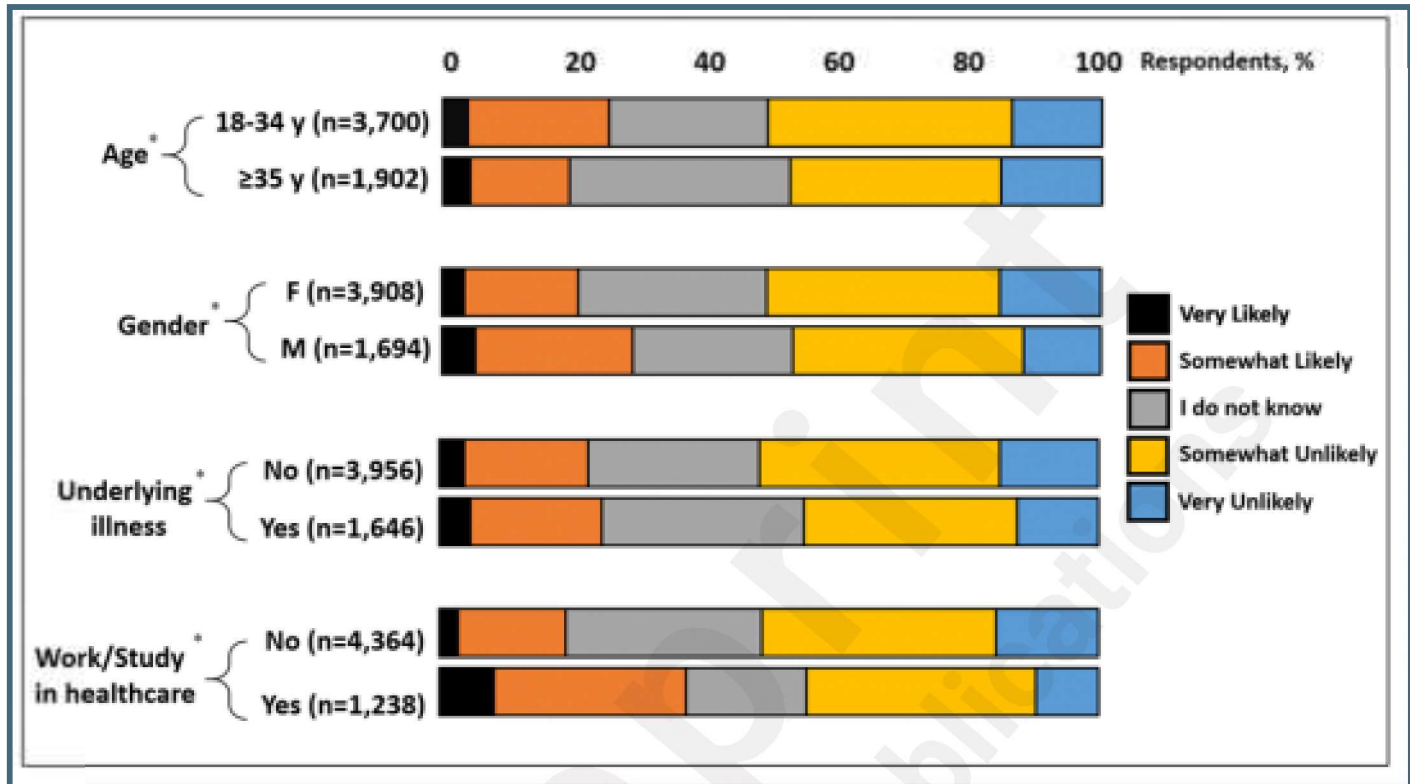
Behaviour(s) done in past week to prevent COVID-19 infection. Results are expressed as % of respondents. n=5,677.



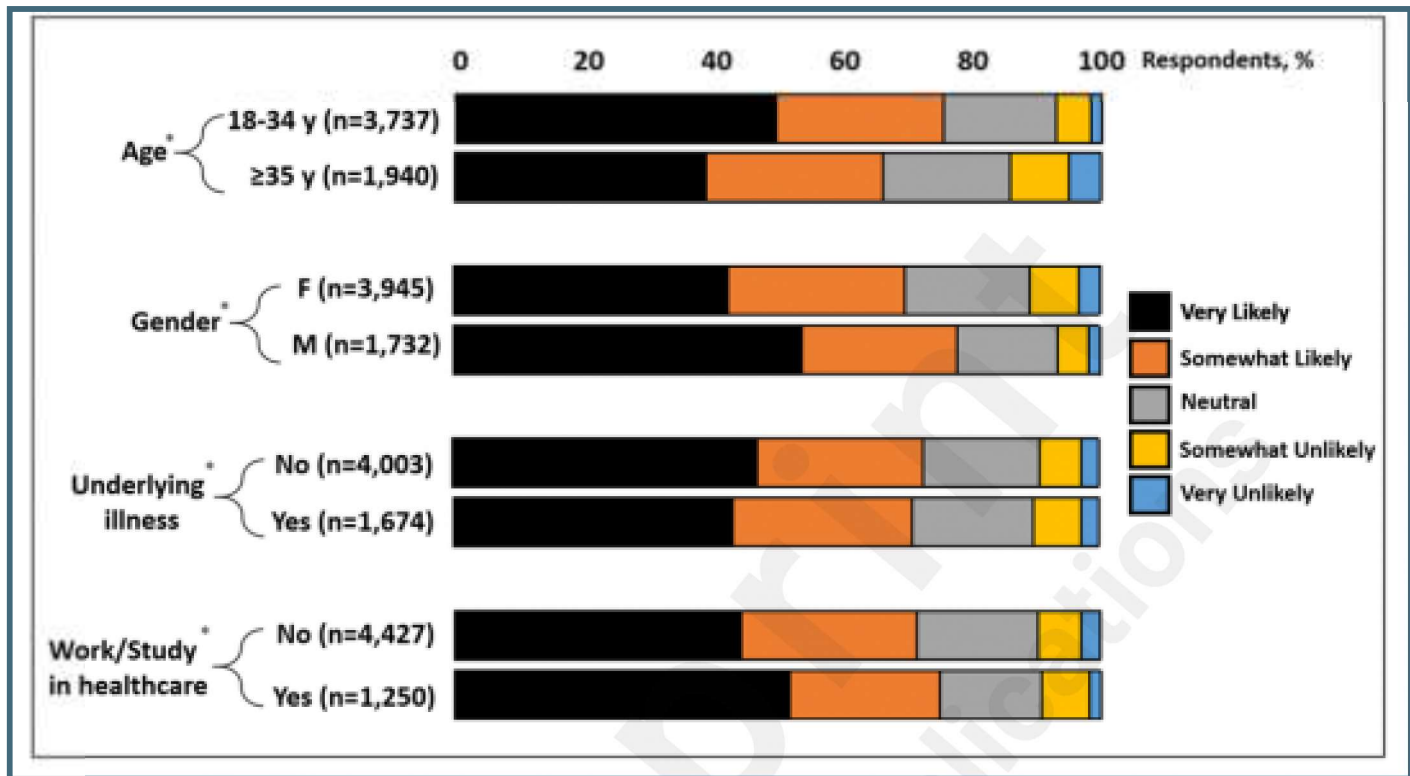
Source(s) of COVID-19 information. Results are expressed as % of respondents. n=5,677.



Likelihood of acquiring COVID-19 infection in next 3 months. Results are categorized by age group, gender, presence of underlying illness(es) and if subject works/studies in healthcare industry. Results are expressed as % of respondents. *n=5,602 in all categories (55 subjects reporting COVID-19 infection were eliminated for this analysis, 20 subjects with no response were also eliminated).



Likelihood of vaccinating against COVID-19. Results are categorized by age group, gender, presence of underlying illness and if subject works/studies in healthcare industry. Results are expressed as % of respondents. *n=5,677 in each category.



Multimedia Appendixes

Survey Questions.

URL: <https://asset.jmir.pub/assets/1914cc5e03ec0f37fbc91ef8059b26a7.pdf>

