

Barriers related to COVID-19 testing intention

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Abstract

Objectives: Although vaccination against the COVID-19 disease has recently become available, individuals are expressing fear and hesitancy towards receiving it. As a result, testing for COVID-19 is still considered a vital method to contain infection. For testing to be effective, barriers towards testing intention need to be investigated; and available literature on the challenges are scarce. This study aimed to investigate barriers of COVID-19 testing among a sample of Jordanian adults and predict testing intention within the context of these barriers.

Methods: A cross-sectional, descriptive, and predictive design was employed in this study among a sample of 1074 Jordanian adults.

Results: Three clusters of barriers predicted testing intention; perceived discrimination at work, concerns of individual's privacy, and having negative feelings towards testing. While perceived discrimination at work and privacy concerns were negatively associated with individuals' intention for testing, experiencing negative feelings towards COVID-19 testing was a positive predictor.

Conclusion: Within the context of the study findings, public health nurses need to promote safety at the workplace, protect an individual's privacy, and eliminate negative feelings towards testing uptake through the provision of accurate and up-to-date information regarding the COVID-19 disease.

KEYWORDS

barriers, COVID-19, education, testing intention

1 | INTRODUCTION

By the end of December, 2020, a vaccination against COVID-19 disease has been adopted by the Jordanian government. The vaccination drive aimed to inoculate around 2 million out of 10 million Jordanian citizens within the first 6 months of 2021. Although the priority of vaccination has been given to the elderly and healthcare workers, the vaccination drive invited all citizens to register for vaccine administration. As of 24th December, only 200,000 citizens had signed up to receive the vaccination despite it being offered free of charge (Arab News, 2021).

As is being seen in other countries, Jordanians have expressed fears over potential adverse effects of the inoculation, leading to vaccine hesitancy or refusal. Such fears stem from anti-vaccine misinforma-

tion campaigns; although pro-vaccination campaigns have been vigorously carried out by the Jordanian government (The Jordan Times, 2020). A further challenge is that during the period of this survey and writing, there remains no available research data on whether the COVID-19 vaccine provides long-term protection against the susceptibility of infection recurrence. Vaccinated individuals remain required to undergo testing if they present with symptoms consistent with those of COVID-19 infection (World Health Organization, 2021). COVID-19 testing and self-isolation of an individual when symptoms are present or a case is suspected, remains a vital strategy for containing the pandemic (Bonner et al., 2020). It is one of the best methods to flatten the infection curve and eradicate COVID-19 disease. For instance, the Australian government made extensive efforts in testing and isolating



patients early on in the pandemic, which resulted in low numbers of infections and a lower death rate (Heath, 2020). To make testing the most effective strategy for controlling the COVID-19 outbreak, barriers towards it need to be investigated; and understanding an individual's testing intention within the context of existing barriers must be attained.

Available studies and media reports suggest the existence of personal and environmental barriers towards COVID-19 testing across countries. For example, in Tanzania, limited access to testing and fake testing kits have been reported (Nakkazi, 2020). In the United States, the cost of testing has been a major issue as health insurance may not cover the testing, and minorities, including non-citizens and immigrants, may lack health insurance (Capps & Gelatt, 2020). Poor health literacy in terms of low knowledge regarding which symptoms require testing to be performed and the processes to follow have been considered another barrier (McCaffery et al., 2020). Testing may also be limited to certain criteria, such as when the individual experiences symptoms regardless of exposure to COVID-19 cases (Frieden, 2020). Structural barriers were also noted. These included issues in delivering tests and transporting samples from remote areas (Bruton & Edwards, 2020). In a developing country such as Bangladesh, structural barriers took a different form represented in insufficient testing centers and the extensive length of time it takes to deliver the results to tested individuals (Rahaman et al., 2020). Personal factors are also represented in cognitive and emotional barriers to testing, including: fear of experiencing pain when tested, lack of knowledge as to how to obtain testing, and the worry that the individual may contract infection at the testing center (Bonner et al., 2020).

Variability in sociodemographic profiles regarding perceived barriers of COVID-19 testing intention is not available in the current literature; however, certain groups were identified to be less likely to understand and act upon COVID-19 preventative measures. These groups include individuals with low health literacy, those whose language is different from English, young people, men, and those with low educational attainment (Pickles et al., 2020).

Despite being a developing country, Jordan has taken several steps to manage and mitigate the COVID-19 outbreak. Since March 17th, 2020, Jordan enforced a complete lockdown after 48 positive COVID-19 cases were reported (Ministry of Health-Jordan [MOH], 2020). Other preventative measures included halting travel between cities, banning international travel, implementing strict curfews where violators are fined, and testing individuals crossing overland borders (Negev et al., 2020). The Jordanian government also emphasized undertaking testing of its residents if the individual presented with symptoms consistent with COVID-19 infection or if the individual had been in direct contact with a positive case (MOH, 2020). However, these strict measures resulted in a downturn in Jordan's economy. As a result, the government eased restrictions, including relaxing most of the governmental sectors, opening its borders, and allowing truck drivers to bring goods from neighboring countries where rates of infection were higher than within Jordan (Safi & Al-Tahat, 2020). The relaxing of these control efforts in the governmental and private sectors in Jordan resulted in an increase in the number of infected COVID-19 cases. By March 22nd,

the number of COVID-19 positive cases reached more than 500,000 (MOH, 2020). Furthermore, at the beginning of the COVID-19 crisis in Jordan, internet users on social media widely shared the names and photos of Jordanian citizens who had tested positive for the disease [20]. This cyber chaos created significant fears and could have affected many Jordanian's intention for testing. Combined with people's hesitancy and fear of being vaccinated, testing for COVID-19 is still considered a crucial strategy for containing the pandemic. Therefore, this study aimed to investigate the barriers of COVID-19 testing and predict testing intention within the context of these barriers among a sample of Jordanian adults.

2 | METHODOLOGY

2.1 | Design and sample

A quantitative, cross-sectional, descriptive, and predictive design was used in this study to explore the barriers toward COVID-19 testing and investigate the role of barriers in testing intention. A convenience sampling procedure was used where the survey was distributed on social media websites to a large number of people. The inclusion criteria were Jordanian individuals whose age is 18 years and older and who speak, understand, and write in Arabic. Those who are younger than 18 years old, who do not reside in Jordan, and who are illiterate were excluded from the study. Inclusion and exclusion criteria were written explicitly in the invitation letter and consent form. The survey was designed so responses were limited to one yielded response per individual. Participants who responded and met the criteria had their data included in the analysis, resulting in a total of 1074 Jordanian adults. The survey was created using Google Forms, a Web-based survey to distribute the study questionnaire.

2.2 | Data collection procedure

The study was approved by the Institutional Review Board (IRB) of the principal investigator's institution. After approval, the survey link was distributed through various social media websites. An invitation letter explaining all aspects of the study including: its purpose, voluntary participation, confidentiality, length of survey, and potential benefits and risks was included in the survey. Furthermore, an online consent form where subjects were instructed to carefully read the informed consent and click on the agreement button if they were willing to take part in the study was included at the beginning of the e-survey. For the purposes of protecting participants' anonymity, no identifying information was gathered in the online survey, and participants were not identified by the e-survey software after the survey had been completed. Completed surveys were automatically saved on Google Forms which is password protected and can only be accessed by the study authors and filled once by each recipient. The data were collected over a 3-month period; from July 1st, 2020 to October 1st, 2020 resulting in 1074 responses. The data were reported in aggregate form.

2.3 | Measures

1. Sociodemographic Data Sheet. Sociodemographic data to be filled out by participants included participants' gender, age, level of education, income, and years of work experience.
2. Barriers to COVID-19 Testing. Items on barriers to COVID-19 testing were adapted from the Barriers to HIV Testing Scale (Mo, Lou, and Fong, 2019). The original scale measures four dimensions of barriers: perceived discrimination at work (one item), that is, "my coworkers will discriminate against me if I undertake COVID-19 testing"; negative feelings about HIV testing (four items), for example, "I will feel anxious awaiting for COVID-19 testing result"; concerns about privacy (three items), for example, "I will be worried about the confidentiality of COVID-19 testing"; and structural barriers (two items), that is, "I fear to catch COVID-19 virus at the testing center". For this study, eight items were adapted from the original scale to reflect the case of COVID-19. Similar to the original scale, items were rated on a five-point Likert scale from 1 = strongly disagree to 5 = strongly agree, with higher scores indicating higher level of agreement to the respective dimension.
3. Intention for testing. Participants were asked to indicate their intention to undergo COVID-19 testing on a five-point Likert scale from 1 = very unlikely to 5 = very likely. This item is an adaptation of the intention for HIV-testing (Mo, Lou, & Fong, 2019). The item reads, "If you suspect yourself of having COVID-19 symptoms, what is the possibility/likelihood your undertaking the test?"

2.4 | Data analysis

The Statistical Package for Social Sciences, version 24, was used for data entry and analyses. Descriptive statistics of frequencies, means, range, and standard deviations were calculated to describe participants' demographics, testing intention, and perceived barriers of testing. Hierarchical multiple regression was used to estimate predictors of COVID-19 testing intention. Participants' sociodemographic variables, including, gender, age, marital status, educational level, and income, were entered in the first model as potential predictors and testing barriers were entered in the second model. Testing intention was entered as an outcome variable.

The instrument Barriers to COVID-19 Testing that was adapted from the Barriers to HIV Testing Scale was validated by a panel of three experts in the area of tool development and validation. The experts reviewed the content of the original scale and rated separately the conceptual equivalence between the original and the adapted instrument. These experts also used the procedures of Brisling (1970) and Chapman and Carter (1979) for the translation of the aforementioned measures to ensure the reliability, validity, and cultural sensitivity of the translation from English to Arabic language. After consensus was reached between the experts on the adapted instrument, the survey was pilot-tested among 12 adults who verified the

final version. In this study, the reliability of the adapted scale was satisfactory with Cronbach's α of .72.

3 | RESULTS

3.1 | Sample characteristics

A total of 1074 Jordanian adults completed and returned the online survey. The majority of participants were female (60.4%, $n = 649$), in the age group of 18 to 33 years old (59.8%, $n = 642$), and single (53.4%, $n = 574$). About 56.1% ($n = 698$) had a baccalaureate degree and 43.9% ($n = 472$) had a monthly income ranging between JD 300 and 700 (USD 423 to 988) (see Table 1).

3.2 | Descriptive statistics of testing intention and barriers

The mean score of participants' intention for testing was 4.6 ($SD = .78$), ranging from 1–5. Regarding COVID-19 testing barriers, the mean score for each subscale was as follows: perceived discrimination at work 2.37 ($SD = 1.22$, range 1–5); negative feelings about testing 14.01 ($SD = 2.89$, range 4–20); privacy concerns 2.81 ($SD = 1.38$, range 1–5); and structural barriers 6.74 ($SD = 2.14$, range 1–10). Descriptive statistics are presented in Table 2.

TABLE 1 Participants' demographic characteristics

Characteristic	Subgroups	N	%
Gender	Female	649	60.4%
	Male	425	39.6%
Age	18–33 years	642	59.8%
	34–50 years	339	31.6%
	51–60 years	77	7.2%
	Above 60 years	16	1.4%
Marital status	Single	574	53.4%
	Married	478	44.5%
	Divorced	16	1.5%
	Widow	6	.6%
Education	Less than high school	49	4.6%
	High school	55	5.1%
	Diploma	78	7.3%
	Baccalaureate	698	65.1%
	Master or higher	194	18%
Family monthly income	Less than JD300 (\$423)	312	29.1%
	JD301–700 (\$424–988)	472	43.9%
	JD701–1500 (989–2117)	217	20.2%
	> 1500 (\$2117)	73	6.8%

Note. $N = 1074$.

TABLE 2 Descriptive statistics of barriers subscales and intention for testing

Variable	M (SD)	Median	Range
Perceived discrimination at work	2.37 (1.2)	2	1-5
Negative feelings about testing	14.0 (2.8)	14	4-20
Privacy concerns	2.8 (1.38)	2	1-5
Structural barriers	6.73(2.14)	7	1-10
Intention for testing	4.69 (.78)	5	1-5

Note. $N = 1074$; M = mean.

Abbreviation: SD = standard deviation.

3.3 | Predictors of testing intention

Two hierarchal regression models were tested to explore predictors of testing intention. The first model (containing gender, age, marital status, educational level, and income) did not significantly predict participants' intention for testing ($F(5, 1010) = 0.91, p = .47$). However, the second model (containing gender, age, marital status, educational level, and income, in addition to testing barriers) showed that three barriers' subscales significantly predicted intention for COVID-19 uptake ($F(9, 1006) = 3.93, p < .001$). More specifically, the subscales of perceived discrimination at work ($\beta = -0.09, t(1006) = -2.93, p < .01$) and privacy concerns ($\beta = -.12, t(1006) = -3.39, p = 0.001$), negatively affected participants' intent to take part in COVID-19 testing. Interestingly, negative feelings about testing ($\beta = 0.13, t(1006) = 3.72, < .001$) positively predicted participants' willingness for test uptake, while the subscale of structural barriers ($\beta = -0.02, t(1006) = -.67, p = .49$) was non-significant. Predictors of testing intention are presented in Table 3.

TABLE 3 Predictors of COVID-19 Testing Intention

	Predictor	DF	SE	t Value	b	B	p
Model 1	Gender	5	.05	1.32	.042	.068	.18
	Age	5	.02	.20	.008	.005	.84
	Marital status	5	.05	.90	.036	.050	.36
	Income	5	.01	-.43	-.016	-.008	.66
	Education	5	.02	-1.17	-.039	-.034	.24
Model 2	Gender	9	.05	1.21	.03	.06	.22
	Age	9	.02	.42	.01	.01	.67
	Marital status	9	.05	.89	.03	.04	.37
	Income	9	.01	-.52	-.01	-.01	.59
	Education	9	.02	-1.08	-.03	.02	.30
	Perceived discrimination at work	9	.02	-2.93	-.09	-.06	.003**
	Negative feelings about testing	9	.01	3.72	.13	.03	.000***
	Privacy concerns	9	.02	-3.39	-.12	-.07	.001**
Structural barriers	9	.01	-.67	-.02	-.009	.49	

Note. $N = 1016$.

Abbreviations: DF : Level of Freedom; SE : Standard Error; B : Regression Coefficient; b : Standardized beta.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

4 | DISCUSSION

This study aimed to identify barriers and predictors of COVID-19 testing intention among a sample of Jordanian adults. Barriers towards COVID-19 testing were adapted from an existing tool assessing barriers of HIV testing. The findings of this study guided by the adapted instrument showed that barriers towards COVID-19 testing predicted participants' testing intention. More specifically, three clusters of barriers were identified: (1) perceived discrimination at work; (2) concerns regarding an individual's privacy; and (3) having negative feelings towards testing. While perceived discrimination at work and privacy concerns were negatively associated with testing intention, experiencing negative feelings towards testing predicted a higher testing intention among participants.

Comparing the results of this study to the available literature and reports of COVID-19 obstacles to testing, it may be inferred that some barriers are culturally specific and socially situated. For example, in a culturally diverse country such as Australia, where health illiteracy was reported as the main barrier towards individuals' testing intention (McCaffery et al., 2020), linguistic difficulties were present. Around 26% of the Australian population was born overseas in non-English speaking countries, and languages such as Italian, Chinese, and Arabic are common among its citizens (Australian Bureau of Statistics, 2020). In a similar vein, the healthcare system of the United States is known to be one of the most expensive worldwide, where employer-provided health insurance is considered the primary means of obtaining healthcare services. Thus, it is not surprising for minorities, including immigrants, who have lost their job due to the pandemic, to have concerns regarding the cost of getting tested (Capps & Gelatt, 2020).



Contextual explanations for this study findings related to perceived discrimination at work as one of the challenges to testing can be related to the fear Jordanian individuals may have regarding losing their job if they receive a positive testing result. Jordan is considered a low-to-middle-income country in which 15.7% of the population falls below the poverty line (Jordan Department of Statistics, 2020). The average monthly salary for a substantial segment of the population barely covers their living expenses. In addition, the capital of Jordan has been rated as the most expensive Arab city to inhabit (The Jordan Times, 2017). In a study exploring the impact of COVID-19 and government response measures on households and businesses in Jordan using an online survey, of the 12,084 respondents included in the study, only 6.8% reported that they were still employed following the spread of COVID-19 and related lockdown measures. More than half (58.6%) of respondents who were employed before the crisis indicated they had lost their entire income (The United Nations Development Programme, 2020). Further, another national study, which employed a telephone survey with a sample size of 1580 respondents, showed that almost half of the employed respondents (48%) anticipate that they might lose their jobs if the COVID-19 crisis continues (International Labour Organization, 2020). Jordanians face a two-fold crisis where the addition of COVID-19 challenges has added significant challenges to an already fragile economy. These factors could have shaped Jordanians' intention for testing. With that being said, the agile and responsive structures and mechanisms established by the Jordanian government need to be continually reviewed and adapted to ensure that testing for COVID-19 would not compromise its citizens' job security. Job insecurity is compromised for Jordanian females due to the extremely low female employment in Jordan (only 10.3%), which underlies the strong gender segregation in jobs in Jordan. Compounded with low wage salaries and the need for females to contribute to their family income (UN Women Jordan, 2020), it is unsurprising that the study sample, which is highly represented by females, fears being discriminated against at work if they undertake COVID-19 testing.

Participants raised concerns regarding the disclosure of their identities if they took part in testing; and this hindered their intention to undergo testing. Such concerns arose from the potential of becoming victims of public humiliation and bullying on social media. At the beginning of the COVID-19 crisis in Jordan, internet users shared the names and photos of Jordanian citizens who tested positive for the disease widely on social media. As this type of privacy violation kept occurring, the Jordanian Armed Forces announced that the army would track down and stop people who violated patients' privacy by sharing their information online (Human Rights Watch, 2020). This cyber chaos created significant fear and could have affected Jordanians' intention for testing. In line with this study findings are those reported from Korea, where the public engaged in profiling and unveiling personal details of infected individuals who became subject to public disdain (Park, Cho, & Ko, 2020). Privacy concerns were also a prominent issue reported among several populations, including the UK, Australia, and the Netherlands, where individuals feared having their identities exposed if a mobile application for contact tracing system was used (Altmann et al., 2020; Bachtiger et al., 2020; Jansen-Kosterink et al., 2020).

Findings supported that testing intention was higher among those individuals who expressed negative feelings towards undertaking a COVID-19 test. This may be explained by the relief these individuals may have after knowing their test result, whether the outcome is positive or negative. If the test result was positive, the individual would be expected to take precautionary measures to prevent infecting their loved ones. If the test result was negative, this could bring them emotional relief. Emotional challenges towards COVID-19 testing were reported. Those including fear of experiencing pain when tested, as well as fear of contracting the infection at the testing center (Bonner et al., 2020). The differences in the findings may relate to methodological variances as the aforementioned study used different sets of questions compared to this study. Future research needs to assess obstacles towards COVID-19 testing utilizing both contextual and universal sets of potential barriers.

4.1 | Limitations and implications

Potential implications for this study should be considered within the context of its limitations. The descriptive nature of studying the research variables and using a self-report questionnaire may introduce social bias. Therefore, future research needs to investigate challenges towards COVID-19 testing using qualitative or a mixed-methods design to obtain in-depth understanding of the studied phenomenon.

Despite these limitations, the study taps a significant gap in the literature and sheds light on important aspects related to COVID-19 testing. In the context of the challenges investigated in this study, public health nurses have essential roles and responsibility as leaders in the detection and control of COVID-19 pandemic. They can implement several strategies to mitigate and prevent the barriers of COVID-19 testing-intention reported in this study. At the workplace, public health nurses need to emphasize infection-control practices and policies for employees. They also need to engage in regular screening and case tracing of those individuals who have been in direct contact with positive cases, and ensure timely quarantine and adherence to quarantine of infected individuals. In terms of ensuring individuals' privacy, public health nurses need to act as advocates of the public through emphasizing the ethical right of protecting clients' privacy. This can be accomplished through monitoring health care organizations' adherence to clients' confidentiality of not breaching their privacy. They may collaborate with local and national officials to implement policies and laws prohibiting the disclosure of the identity of those who are infected. These laws should address the prohibition of privacy breaches, whether through formal or informal means of communication, including social media. Although they felt negatively towards COVID-19 testing, nonetheless, people chose to get tested. Providing accurate information regarding COVID-19, its symptoms, and management by public health nurses would help mitigate negative feelings and improve the psychological well-being of people before, during, and after testing. This goal can be achieved through conducting educational campaigns utilizing various means of communication.

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CONFLICTS OF INTEREST

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

ETHICAL APPROVAL

This research study was granted approval from the Institutional Review Boards (IRB) of Jordan University of Science and Technology with an IRB approval number of 325-2020.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request

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