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Abstract

Purpose: The massive spread of the new coronavirus, starting from China, continues to threaten the lives of populations worldwide. With no available treatment or vaccine, precautionary behaviors remain the principle preventive measure against the disease. The current study aimed at exploring the factors predicting adherence and adoption of individuals to the recommended precautionary practice in Saudi Arabia.
Methodology: Through a cross-sectional design, using a predesigned questionnaire distributed through social media and targeting general adult Saudi population, 1860 individuals responded in almost two weeks. The used questionnaire included, in addition to demographic characteristics, perception of the respondents to the seriousness of the disease, and their compliance with the recommended protective measures of Covid-19.
Findings: The total respondents were 1860, among which 1680 individuals responded within the first week of the study (March 2020). The majority of responders were Saudi (90.4%), with marked dominance of females (74.1%), and their mean age was 39.2± 11.6 years. Slightly more than one-half of the respondents (57.2%) agreed that Covid-19 is a serious disease. The perception of participants about the seriousness of Covid-19 was significantly higher among retired individuals $p<0.05$. Those who perceived Covid-19 as a serious disease were significantly keener to comply with the recommended protective measures against Covid-19. Two-thirds of the respondents (65.8%) expressed that they are worried that the spread of the disease may become worse, and 15.1% always feel afraid to get the disease. Those who felt fearful of getting the disease were significantly more compliant with the protective measures. The primary source of information about Covid-19 was MOH (1164, 62.6%).
Unique contribution to theory, practice and policy: Perception of the seriousness of the disease and fear of getting the disease are significant predictors for compliance with recommended protective measures, although it could be beneficial during pandemics; however, the consequences of long-standing worry and fears should be taken into consideration of the health care providers.

Keywords: *Covid-19, behavior, protective measures, predictors.*

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1. INTRODUCTION

The new coronavirus responsible for the recent global pandemic was declared by the World Health Organization (WHO) on March 11th, 2020. It started in Wuhan city in China, where the first case presented with severe acute respiratory tract infection December 31st[st], followed by multiple cases clustered in wholesale animal and seafood markets. On January 7th[th,] 2020, the new virus was identified as Covid-19.(Rothan & Byrareddy, 2020) The virus rapidly and massively spread all over China with a considerable toll of mortalities. Afterwards, the virus attacked several countries in Europe; and finally prevailed across the globe.(Tavakoli et al., 2020) In Saudi Arabia, the first case was registered on March 2nd[nd], 2020, for a Saudi male arriving from Iran via Bahrain. The Kingdom of Saudi Arabia follows the WHO pandemic preventive measures to control the spread of Covid-19. As an immediate response, the country took several escalating regulations to control for the spread of the disease; as banning travels for any reasons, social distancing by closing the schools and universities, closing all gathering places, closing the malls and entertainment areas, as well as temporarily holding prayer in mosques.(Barry et al., 2020) The WHO put a set of recommendations that would help in preventing the spread of the disease. These included, "regularly and thoroughly clean hands with soap and water, avoid touching eyes, nose and mouth, avoid going to crowded places, follow good respiratory hygiene, stay home and self-isolate even with minor symptoms, wear a mask when you need to leave home, and seek medical attention if you have fever, cough or difficulty in breathing." They also emphasized the importance of keeping up to date for the latest information from trusted sources.(Sohrabi et al., 2020)

The lessons learnt from previous pandemics could help in dealing with the current COVID-19 pandemic. In 2009 during H1N1 pandemic, when no vaccine was available, a study in USA showed that 59 to 67% of the Americans adopted the hand hygiene early in pandemic, and 55% stayed at home if they got sick and 38% avoided contact with people with flu like symptoms. Around 25% of the Americans applied the social distances but few of them (4-8%) had worn face mask. Later, when the vaccine was available, only one half of the Americans accepted to be vaccinated, while the others refused because they were not sure about safety of the vaccine. (Gillian K. SteelFisher, Ph.D., Robert J. Blendon, Sc.D., Mark M. Bekheit, J.D., and Keri Lubell, 2010). This outbreak of H1N1 noted disagreement between the public response and the public health steps recommended and undertaken by WHO and national health institutions. General public initially adopted the regulations by WHO releases and warnings, but it quickly turned to discontent and mistrust when the initial wave of the outbreak failed to be controlled.(Huremović, 2019)

2. METHODOLOGY

Through a cross-sectional study design targeting adult Saudi population, with an estimated sample size of at least 1800 respondents to achieve study objectives, an online questionnaire was used to collect data during the period from 14th till March 18th, 2020. This was ten days after the announcement of the first positive case of Covid-19 in Saudi Arabia and the beginning of applying the pandemic measures in the country. The researchers leaned towards using web-based applications for collection of data because it was not feasible to do sampling survey during this

special period. The questionnaire had been prepared and reviewed by three experts in biostatistics, epidemiology, and family medicine. A pilot study was conducted on 15 individuals, to ensure the applicability of the questionnaire and to estimate the time needed to complete it. The questionnaire was uploaded on google forms and made available to the general population through social media applications. The questionnaire included demographic characteristics of the participants, their awareness about the magnitude of the pandemic and seriousness of the disease, the impact of the pandemic on their emotional response and fear, sources of information about Covid-19 infection, and their willingness to comply with protective measures of the disease (personal hygiene, hand wash, wearing mask and gloves and the use of sanitizers).

Moreover, the researchers tried to assess their opinion about expected significant changes in their social practices, including gathering, suspension of prayer in mosques, and closing of schools. The questionnaire was preceded by a greeting letter, detailing the purpose of the study and informing the participants that their participation is optional, with the right of withdrawal at any stage of the study. The study was approved by the Institutional Review Board (IRB) of the Health Affairs in Jeddah.

3. RESULTS

3.1 Demographic characteristics of the respondents:

Out of all respondents (n=1860), the overwhelming majority were Saudis (90.4%), with marked dominance of females (74.1%). The mean age was 39.2± 11.6 years (range 18-83 years), and those aged 50 years or older formed 20.8%. Most of the respondents were married (69.9%), and 69.5% had children. One-half of them were employed (51.4%), and 9.1% were students. Health workers formed a third of the participants (32.5%). [Table 1].

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Table 1: Demographic characteristics of the study group (n=1860).

Characteristics	Frequency	Percent
Nationality:		
Saudi	1682	90.4
Non-Saudi	178	9.6
Gender:		
Males	481	25.9
Females	1379	74.1
Age categories:		
<30 years	392	21.1
30-39 years	591	31.8
40-49 years	490	26.3
50-59 years	283	15.2
≥60 years	104	5.6
Marital status:		
Single	403	21.7
Married	1300	69.9
Divorced	129	6.9
Widowed	28	1.5
Have children:		
Yes	1292	69.5
No	568	30.5
Occupation:		
Employed (n=956, 51.4%)		
Health workers	351	18.9
Others	605	32.5
Housewives	517	27.8
Students	218	11.7
Retired	149	9.1

3.2 Compliance of the respondents to protective measures:

About one-half of the respondents (57.2%) agreed that Covid-19 is a serious disease, while a quarter (25.9%) were not sure about its seriousness, and 17% did not perceive it as a serious disease. [Figure 1]

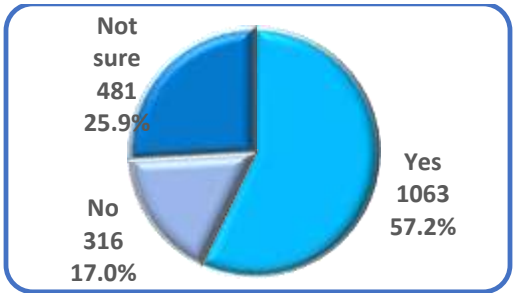

Figure 1: Agreement of the respondents about the seriousness of Covid-19 infection

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The perception of participants of the seriousness of Covid-19 was significantly greater among retired individuals as 65.1% of them perceived it as a serious disease compared to 52.4% of those who were housewives ($p<0.05$). No statistically significant differences were found in other demographic characteristics. Those who perceived Covid-19 as a serious disease were significantly more likely to comply with the recommended protective measures against Covid-19 compared to those who did not perceive as such. This applied to increased hand hygiene (87.5% vs 73.5%), increased using hand sanitizers (65.8% vs 50.6%), applying facemask (34.3% vs 19.7%), avoiding sick people (80.2% vs 68.5%), decreased social visits (72.5% vs 58.1%), decreased handshaking (77.2% vs 58.1%) and, decreased use of public facilities (85.8% vs 75.4%) ($p<0.05$) [Table 2].

Table 2 : Compliance with protective measures of Covid-19 according to the perception of the seriousness of the disease.

Compliance for protective measures of Covid-19		Perceive Covid-19 as a serious disease				X^2	P
		Yes		No or not sure			
		No	%	No	%		
Increased compliance with the instructions of hand hygiene	Yes	930	87.5%	586	73.5%	58.908	<0.001*
	No	133	12.5%	211	26.5%		
Increased compliance with the instructions of using hand sanitizers.	Yes	699	65.8%	403	50.6%	48.343	<0.001*
	No	364	34.2%	394	49.4%		
Increased compliance with the instructions of applying facemask.	Yes	365	34.3%	157	19.7%	43.543	<0.001*
	No	698	65.7%	640	80.3%		
Considering the avoidance of sick persons.	Yes	852	80.2%	546	68.5%	33.077	<0.001*
	No	211	19.8%	251	31.5%		
Decreased social visits.	Yes	771	72.5%	463	58.1%	42.522	<0.001*
	No	292	27.5%	334	41.9%		
Decreased handshaking.	Yes	821	77.2%	466	58.5%	75.243	<0.001*
	No	242	22.8%	331	41.5%		
Decreased using public facilities.	Yes	912	85.8%	601	75.4%	32.384	<0.001*
	No	151	14.2%	196	24.6%		

Based on Chi-square **Statistically significant*

A total of 65.8% of the respondents expressed that they are worried that disease spread may become worse, and 15.1% always felt afraid of getting the disease. Therefore, the great majority of the respondents (93.3) agreed that they are willing to comply with quarantine measures if decided. On the same line, those who felt afraid of getting the disease were significantly more compliant with the protective measures than those who were not afraid. Behaviors mostly reported were, increased frequency of hand hygiene (84.7% vs 77.1%), increased use of hand sanitizers (65.5% vs 50.4%), applying facemask (32.9% vs 21.2%), avoiding sick person (78.8% vs 70.1%),

decreased social visits (72.0% vs 58.4%), decreased handshaking (75.1% vs 60.9%), and decreased use of public facilities (84.0% vs 77.6%) p<0.05 [Table 3].

Table 3: Compliance to protective measures of Covid-19 according to feeling afraid to get the disease.

Compliance for protective measures of Covid-19		Feeling afraid to get Covid-19				X^2	P
		Yes		No			
		No	%	No	%		
Increased compliance with the instructions of hand hygiene	Yes	921	84.7%	595	77.1%	17.204	<0.001*
	No	167	15.3%	177	22.9%		
Increased compliance with the instructions of using hand sanitizers.	Yes	713	65.5%	389	50.4%	42.896	<0.001*
	No	375	34.5%	383	49.6%		
Increased compliance with the instructions of applying facemask.	Yes	358	32.9%	164	21.2%	30.416	<0.001*
	No	730	67.1%	608	78.8%		
Considering the avoidance of sick persons.	Yes	857	78.8%	541	70.1%	18.269	<0.001*
	No	231	21.2%	231	29.9%		
Decreased social visits.	Yes	783	72.0%	451	58.4%	37.117	<0.001*
	No	305	28.0%	321	41.6%		
Decreased handshaking.	Yes	817	75.1%	470	60.9%	42.784	<0.001*
	No	271	24.9%	302	39.1%		
Decreased using public facilities.	Yes	914	84.0%	599	77.6%	12.252	<0.001*
	No	174	16.0%	173	22.4%		

Based on Chi-square **statistically significant*

3.3 Sources of Information about COVID -19:

Regarding the source of information about Covid-19 at the time, almost two-thirds of the respondents (1164, 62.6%) reported the MOH as the commonest source for their information. This was followed by social media (1143, 61.5%), news press (947, 50.9%) and WHO (681; 36.6%) [Figure 2].

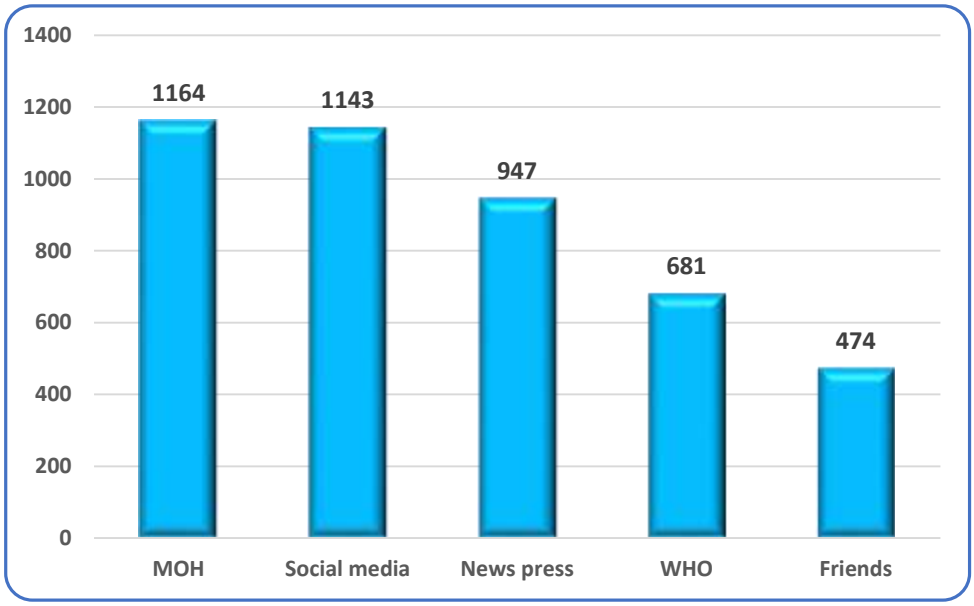

Figure 2: Sources of information about Covid-19 infection.

4. DISCUSSION

With no existing vaccine or treatment, precautionary behavior is considered vital for stemming the spread of Covid-19.(Sohrabi et al., 2020) Therefore, it is essential to understand the factors influencing the adherence of individuals and communities to infection prevention hygiene programs. The expectation of behavior in pandemics would help decision-makers to reform strategies aimed at minimizing the impact of the disease. In this study, we surveyed our general population in Jeddah, Saudi Arabia, while the pandemic was not yet declared. The community was well represented in our sample in terms of gender, age, and nationality. Their immediate response to the survey reflects their interest and worry about the disease. The results showed that the majority of the respondents perceived that Covid-19 is serious and differs from previous traditional influenza. Thus, they were afraid that the disease would spread rapidly, and they could get the infection. According to Alecu (2020), fear and anxiety are the main pandemic-related emotional reactions.(Alecu, 2020) People's fears are usually focused upon their health, family and safety, and any threat to their financial status or jobs. Pandemics are often associated with uncertainty, confusion, and a sense of urgency.(Sohrabi et al., 2020) This has been observed in the ongoing Covid-19 pandemic outbreak due to the fast spread of the disease and the high mortality globally, putting people under a lot of stress.(Dubey et al., 2020) The sense of uncertainty and confusion could explain the rapid response to our survey and a remarkable sense of fear and worry among our respondents, especially among females who showed higher levels of anxiety and fear than men.

Similar findings were reported in China, where female students rated their psychological distress as moderate-to-severe during the initial phase of the COVID-19 outbreak in China.(Wang et al., 2020) During the early stages of an epidemic, and in particular with new emerging infectious diseases like COVID 19, people seek information from different sources (internet, social media, peers, etc.).(Sanche et al., 2020) Health authorities should respond promptly with clear, evidence-based public health information to maximize trust.(Carvalho et al., 2020) In this study, the most trustworthy sources of information were the MOH site, followed by social media (half of the participants). In contrast, previous studies showed social media as the last source of information. People are usually more compliant with pandemic preventive measures and governments curfew; if they believe they might be affected by the outbreak, the recommended behaviors are effective, the illness has severe consequences, or is difficult to treat. Participants who agreed that the disease is serious, were significantly more likely to follow the recommended preventive measures such as frequent hand washing, using the sanitizers, avoiding handshaking, social distancing, adhering to the ban of prayer in mosques including the two holy mosques, and avoiding sick people. Our findings are supported by Alnajjar (2016), who showed that the only predictor of positive behavior change (e.g., social distancing, improved hand hygiene) was fear.(AlNajjar et al., 2016) Although fear and anxiety could have a positive impact in the form of increasing compliance to instructions and adherence to precautionary behavior, the longstanding feeling of fear and anxiety could result in depressive symptoms or frank depression. It is essential to put this into consideration in the management of the COVID-19 pandemic.

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