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Impact of Covid-19 risk perception on compliance with preventive measures among adult Egyptians

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ABSTRACT

Background: The current COVID-19 pandemic has rapid inevitable effects on individuals' health and life, which need to heighten readiness to comply with preventive measures and adjust our health behaviors. The aim of this study was to assess the impact of COVID-19 risk perception on compliance with preventive measures among adult Egyptians. *Materials & methods:* A cross-sectional study conducted on 582 participants who met the inclusion criteria. An online, self-administered questionnaire sent to participants through different social media platforms; it consisted of three parts concerned with sociodemographic data, risk perception scale, and COVID-19 preventive measures scale. *Results:* The mean age of the study participants was 34.16 ± 9.86, and 87.8% of them had high compliance with COVID-19 preventive measures. The results also showed high COVID-19 risk perception among participants with a weighted mean of 4.01±0.74. The results reported a positive relationship between compliance with preventive measures and COVID-19 risk perception ($r = 0.183$, $P<0.001$). Also reported that risk perception is the most important predictor of compliance with preventive measures [OR=3.100, $p <0.001$, 95% CI (1.715-4.975)], followed by educational level [OR=2.921, $p <0.001$, 95% CI (1.557-6.172)]. *Conclusion:* Risk perception is the strongest predictor of compliance with protective measures, the findings of this study added to the rising literature suggesting that COVID-19 risk perception is an important factor in predicting compliance with preventive measures.

Keywords: Compliance; COVID-19; Preventive measures; Risk perception

1. INTRODUCTION

World Health Organization (WHO) reported on December 2019 a viral pneumonia outbreak in China, this outbreak now known as Coronavirus Disease 2019 (COVID-19) and officially considered as a pandemic (Villela et al., 2021; Zhu et al., 2019; Gorbalenya et al., 2020). From this time and with absence of available pharmaceutical protocols and vaccines needed to treat affected people and control infections, most countries around the world have implemented public health measures containment and alleviation strategies

such as increased hygienic procedures, social distancing, and self-isolation (Shahin et al., 2020). Despite all these strict measures, the spread of COVID-19 is continuously rising which affecting all sectors of societies in a direct and indirect way (Sohrabi et al., 2020; Heydari et al., 2021). The community-level commitment to the measures taken to control the spread of the infection may determine the extent and duration of the COVID-19 pandemic (Acuña-Zegarra et al., 2020; Jarvis et al., 2020). Compliance with these measures requires cooperation from population which depends on several factors such as individuals' risk perception regarding threats of infection (Shahin et al., 2020; Wrighta et al., 2021; Sheeran et al., 2014).

Risk perception considered a major characteristic of many health-behavior theories; it plays a central role in assessing community awareness regarding the severity of the pandemic and to what extent the individuals' willingness to cooperate in the implementation of preventive measures (Shahin et al., 2020; Hassan et al., 2020). So the governments have an important role during the COVID-19 pandemic through different communication channels to increase the perception of seriousness and focus on risk perception and the important role of preventive behaviors to cope with the COVID-19 pandemic accordingly reducing the risk of spread infection (Shahin et al., 2020). In Egypt, the first case of COVID-19 reported on 14 February 2020, from this time to March 2021, there are 202,131 confirmed cases with 11,995 deaths from COVID-19 with a rapid susceptibility toward increase (WHO, 2021). So as the numbers of infected persons and deaths result from the COVID-19 pandemic continue to increase in Egypt, the United Nations (UN) in Egypt in collaboration with the government are currently conducting risk communication campaigns to the public using all the available national media and communication tools such as television, radio, social media, outdoor billboards, and branded buses. In addition to distributing brochures and leaflets to various target groups across the country in order to increase people's risk perception and awareness regarding preventive measures (UN, 2020). Therefore, our aim of this study was assess the impact of risk perceptions on COVID-19 preventive measures compliance.

2. METHODOLOGY

Study Design and Population

This is an observational cross-sectional study designed to assess the impact risk perception of COVID-19 on compliance with preventive measuresamong adult Egyptians by using online self-administered questionnaire. The link of the survey shared through social networking platforms. It conducted from first of June 2020 to 30 June 2020. A convenience sample of 582 participants who met the inclusion was included by using the snowball sampling technique.

Inclusion and Exclusion Criteria

Participants from both, sexes, aged 18 years and more, using social media platforms, and, willing to, give informed consent which included in the first part of the questionnaire. Other nationalities who live in Egypt not included in the study.

Study Tools

It consisted of the following three parts: Socio-demographic characteristics: age, gender, marital status, educational level, occupation, place of work, residence, and monthly income.

Risk Perception Scale which adapted from relevant resources (Voeten, 2015; Sang-Hwa, 2015) consisted of 5 items rated on a five-points Likert scale from (one) strongly disagree to (five) strongly agree. The total score calculated where higher scores signify a higher COVID-19 risk perception level

COVID-19 preventive measures scale which developed by researchers after a thorough review of relevant and recent literature to assess the extent of engagement in COVID-19 preventive measures compliance (WHO, 2020). It incorporated 6 items rated on a five-point Likert scale from (one) never to (five). The total score was calculated where higher scores highlighted a higher preventive measures compliance regarding COVID-19.

Validity and reliability

A jury of 5 experts in community health examined the tool for content validity to ensure the relevance of the content. Next, a pilot study applied on 20 participants to assess questionnaire'svalidity and reliability, accordingly the needed modification done. In addition, the reliability of the tool assessed using Alpha Cronbach scale; risk perception (α=0.85) and preventive behaviors (α=0.80).

Data Collection

The Snow ball sampling technique was used to collect data from an online self-administered questionnaire, which was distributed via email, WhatsApp groups, Facebook groups, and other social media platforms. When the participants receive the link, they

directed to the information part about the study then informed consent. After they accept to take the survey they filled out the questionnaire.

Statistical Analysis

The data analyzed using SPSS Version 20.0. Descriptive statistics for data expressed by mean, SD, frequency, and percentage. Inferential statistics were done using binary, logistic, regression analysis, in order to perform these analysis dependent categorical variables recorded to be dichotomous variables. P-value was significant at 0.05.

Research Ethics

The participants received the questionnaire with informed online consent and an explanation of the study's purpose. All required instructions explained prior to proceeding to the survey. Participants were assured about the anonymity and confidentiality of their information that it will be used only for the study's purpose.

3. RESULTS

Socio-demographic characteristics of the study participants

Table 1 shows that the study participants' age is 34.16 ± 9.86, 74.9% of them are females and 59.8% are married. Less than half (48.8%) have a bachelor's degree while only 3.3% have primary education and 61.7 are working with 67.7 % of them are working in the governmental sector. Enough monthly income for basic needs only is found among 49.1% of the study participants.

Table 1 Distribution of the study participants according to socio-demographic characteristics (n=582)

Parameters	No.	%
Age (in years)	Mean ± SD	34.16 ± 9.86
18 > 25	113	19.4
25 > 35	194	33.3
35 >45	173	29.7
≥ 45	102	17.6
Gender		
Male	146	25.1
Female	436	74.9
Marital status		
Single	205	35.2
Married	348	59.8
Widow	4	0.7
Divorced	25	4.3
Educational Level		
Primary education	19	3.3
High school	48	8.2
Bachelor education	284	48.8
Post graduate education	231	39.7
Working status:		
Working	359	61.7
Not working	223	38.3
Place of work	n=359	
Governmental sector	243	67.7
Non-governmental sector	106	29.5
Free business	10	2.8
Monthly income		
Not enough and need to loan	79	13.6

Parameters	No.	%
Enough for basic needs only	286	49.1
Enough and saving from it	217	37.3

Descriptive statistics of COVID-19 risk perception and compliance with preventive measures

Figure (1) highlights that 87.8% of the study participants had a high level to follow COVID-19 preventive measures while only 3.1 % had a low level to follow COVID-19 preventive measures with a weighted mean of 4.34±0.72. Figure (2) elaborates that most of participants had either high (72.2%) or moderate (21.1%) total COVID-19 risk perception with weighted mean 4.01±0.74.

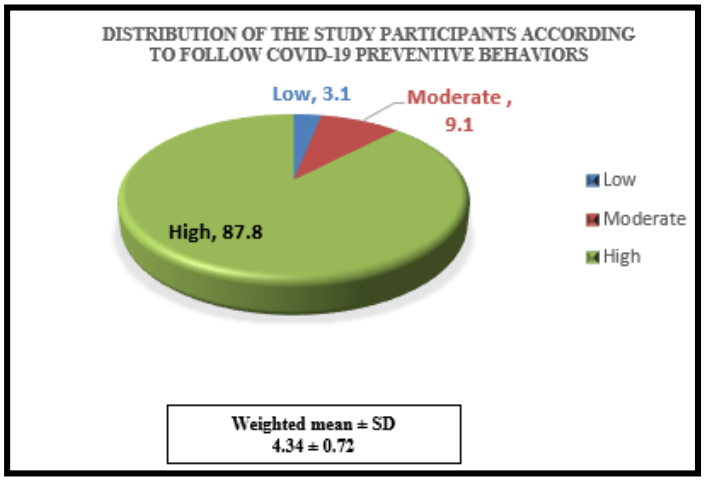

Figure 1 Distribution of the study participants according to follow COVID-19 preventive measures (n=582)

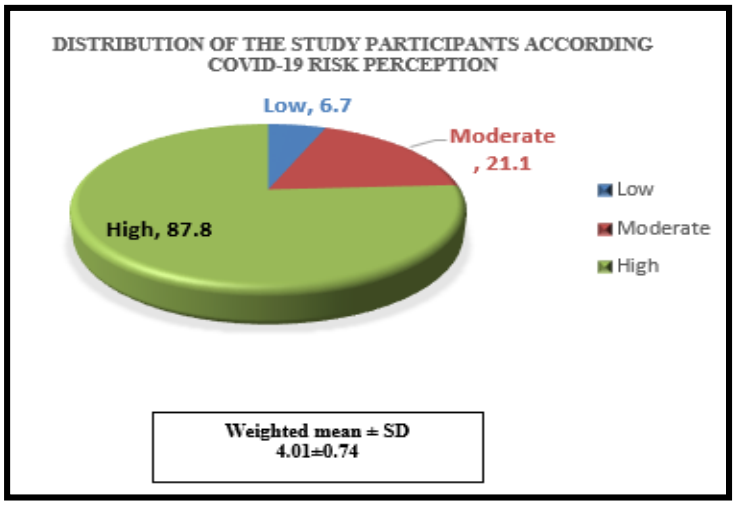

Figure 2 Distribution of the participants according to COVID-19risk perception (n=582)

Relationship between compliance with preventive measures and participants' risk perception

Table 2 shows positive relation with highly statistically significant differences between compliance with preventive measures and COVID-19 risk perception (r = 0.183, P<0.001).

Impact of COVID-19 risk perception on preventive measures

Table 3 present the binary logistic regression model is statistically significant (X^2 = 55.16, p <0.001). Risk perception is the strongest predictor of COVID-19 preventive behaviors [OR=3.100, p <0.001, 95% CI (1.715-4.975)], followed by educational level [OR=2.921, p <0.001, 95% CI (1.557-6.172)], age [OR=1.052, p <0.05, 95% CI (1.011-1.094)], and marital status [OR=0.520, p <0.05, 95% CI (0.272-0.995)]. While gender, Monthly income, and working status were not statistically significant predictors with p value > 0.05.

Table 2 Correlation between preventive measures compliance and risk perception (n=582)

Variables	Preventive behaviors	
	r	P value
Risk perception	0.183	0.000**

r refers to Pearson's correlation coefficient

*Correlation is significant at the 0.05 level (2-tailed).

**Correlation is highly significant at the 0.001 level (2-tailed).

Table 3 Binary Logistic regression model of the relationship between COVID-19 preventive behaviors and the study variables (n=582)

Variables	B	p-value	OR	95%CI for OR	
				Lower bound	-Upper bound
COVID-19Risk perception	1.131	0.000**	3.100	1.715	4.975
Educational level	1.072	0.001**	2.921	1.557	6.172
Age	0.051	0.013*	1.052	1.011	1.094
Marital status	0.654	0.048*	0.520	0.272	0.995
Gender	0.437	0.140	1.548	0.866	2.765
Monthly income	0.599	0.071	1.820	0.949	3.490
Working status	0.152	0.615	1.164	0.643	2.106

OR: Odd Ratio

*P value significant at 0.05

** P value highly significant at 0.001

4. DISCUSSION

The focus of this study was to assess the impact of COVID-19 risk perception on compliance with preventive measures over COVID-19 pandemic. A convenience sample of adult Egyptians participated in the study after four months from the first formal reported case in Egypt. The present study reported that majority of the participants had high COVID-19 risk perception, this can attributed to the nature of COVID-19 as a new infectious disease in Egypt's modern era since the influenza A (H1N1) 2009 which was the last prevalent infectious disease in this century. In addition, COVID-19 leading to community-wide outbreaks and has the ability to spread rapidly worldwide, causing a pandemic (Egyptian MOH, 2019). This result also was concordant with the results reported by (Kyaw et al., 2020), who found that participants in Myanmar reported high levels of risk perception. Also (Taghrir et al., 2020) showed that the Iranian medical students had moderate COVID-19, risk, perception, this may be attributed to the nature of the medical professionals who had high level of COVID-19 related knowledge and self-protective behaviors. However, a study from the USA by (DeBruin et al., 2020) showed low COVID-19 risk perception. This ascribed to the earlier conduction of the study where the disease pandemic state was in the beginning. Also, (Shabu et al., 2021) indicated a significant weak positive risk perception and protective behaviors relationship. These results may be attributed to those later respondents had higher risk perception than earlier ones.

The present study represented that most of participants had high compliance regarding COVID-19 preventive measures with a positive relation between compliance with preventive measures and COVID-19 risk perception. This may be because of all participants were educated and most of them had higher education, and it was notable that we found in the current study clear evidence of the association between level of education and compliance with preventive measures. The study done by (Shahin et al., 2020) which observed performing preventive measures on three different Arab countries Egypt, Saudi Arabia, and Jordan; found that Egyptian participants had the lowest, risk, perception and preventive measures compliance. The authors attributed that to differences in educational levels, noting thata high number of the Egyptian participants had a diploma compared with participants from Saudi Arabia and Jordon.

This result supported the association between the level of education and compliance with preventive measures reported in the current study. Similarly, (El-Zoghby et al., 2020) in their study in Egypt, reported higher educational, levels, were linked to

increased awareness which can lead to increase engagement in preventive measures in suspicious infection. Likewise, (Yildirim et al., 2020) and a study from Europe by (Cvetkovic et al., 2020) found that COVID-19 preventive behaviors were significantly correlated with higher educational levels. (Abdelhafiz et al., 2020) demonstrated that individuals with bachelor level of education or higher had participants with higher levels of education had significantly higher mean scores on COVID-19 than those with lower levels of education. The study done by (Wrighta et al., 2021) also added that the higher compliance to preventive measures was related to higher levels of knowledge and information-seeking relating to COVID-19 which is more available in educated people unlike not educated. Likewise, a study from Ethiopia by (Akula et al., 2020) revealed that 47.3 of study sample had poor COVID-19 preventive practices where only 25.9% had good practices. This can be attributed to that the target group of this study was chronically ill patients, who were older (56.5±13.5), less educated, and had lower income.

Finally, the current study found that COVID-19 risk perception was the strongest predictor of compliance with protective measures followed by level of education indicated that participants with high level of COVID-19 risk perception were more likely to follow COVID-19 preventive measures than those with low-risk perception. As mentioned by (Ferrer et al., 2015) risk perception is a key component of many health-related behavior change theories, this confirmed the result of the current study which found that high level of risk perception among participants played a crucial role in motivating their compliance with Covid-19 preventive measures. Similarly, (Yildirim et al., 2020) found that the perceived risk of COVID-19 was a considerable predictor of compliance with its preventive behaviors. (DeBruin et al., 2020) also reported that both perceived risk of infection and fatality of COVID-19 were significant predictors of engagement in preventive behaviors.

Limitations of the Study

The current study had several limitations; first all participants were educated, so it's difficult to generalize results for not educated. Also, it included people who have access to different social media platforms. The study findings were based on self-reports so it's difficult to verify if these responses corresponded with the real preventive measures of the respondents or not.

5. CONCLUSION

The present study concluded that most, of the study participants had high compliance regarding COVID-19 preventive measures. It showed a positive relation between compliance with preventive measures and COVID-19 risk perception. The majority, of the study participants had high and moderate risk perception, which was found to be the most important predictor for COVID-19 preventive measures compliance. Also having higher education was found to be a significant predictor for adherence to COVID-19 preventive behaviors. Although the vast majority of participants reported high-risk perception level and high preventive measures compliance regarding COVID-19, the spread of COVID-19 is continuously rising in Egypt so the Egypt government should imposed restrict penalties for deviation from COVID-19 preventive measure compliance.

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Conflict of interests

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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