

# Misconceptions and Fears among Primary Health Care Physicians in Aseer Region, Saudi Arabia, regarding COVID-19

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## Abstract

This study aimed to identify primary care physicians' misconceptions regarding COVID-19, and to assess their fear of COVID-19. Following an analytical cross-sectional study design in primary health-care (PHC) centers in Aseer Region, Saudi Arabia, 515 PHC physicians were included. A self-administered questionnaire was used for data collection. It included personal characteristics, misconceptions about COVID-19, and the Fear of COVID-19 Scale. Results showed that only 10.5% of PHC physicians did not have any misconceptions regarding COVID-19, while 53.6% had low misconceptions and 35.9% had high misconceptions. PHC physicians' main sources of information about COVID-19 were the social media (58.1%), followed by the Internet (55.5%), and mass media (47%). More than half of primary care physicians (50.1%) had high grades of fear of COVID-19. PHC physicians' misconceptions scores significantly and positively correlated with their COVID-19 fears scores ( $r=0.425$ ,  $p<0.001$ ). Differences in grades of misconceptions among PHC physicians differed significantly according to their nationality ( $p=0.003$ ), but did not differ significantly according to any other personal characteristics. The youngest PHC physicians (aged <30 years) had significantly the highest grades of high fear of COVID-19 (58.4%,  $p<0.001$ ). Female PHC physicians had significantly more high fear grade

toward COVID-19 than males (56.6% and 47.2%, respectively,  $p=0.048$ ). The study concluded that misconceptions and fears regarding COVID-19 are common among PHC physicians in Aseer Region. Social media is the main source of health information regarding COVID-19. Fear among PHC physicians is significantly and positively correlated with their misconceptions.

**Keywords:** Misconceptions, Corona phobia, Fear of COVID-19, Primary healthcare, Saudi Arabia

## Introduction

The coronavirus disease 2019 (COVID-19) is a first-time experience to witness a pandemic for most of the world's populations. More than a century ago, the last recorded pandemic was the "Spanish flu", which lasted from 1918 to 1920 and resulted in an estimated 50 million deaths (1).

Since its emergence in, Wuhan, China, COVID-19 has spread worldwide. As of May 9th 2022, 517,364,664 infections, and 6,276,552 deaths were reported worldwide, with 755,415 infections and 9,103 deaths reported in Saudi Arabia (2).

The rapid infection rate of the virus and its associated fatalities has led to anxiety and panic of varying degrees (3-4), associated with swift government interventions, e.g., prohibition of mass gatherings (5), increase in laboratory testing capacities, overhauling of the healthcare systems (6) and policies (7).

Anxiety and panic could also be linked to the unavailability of a definitive drug and further compounded by the series of "conspiracy theories", being propounded especially via social media channels (8-9).

Yildirim et al. (10) noted that in circumstances of uncertainties such as this pandemic, individuals would exhibit varying degrees of negative emotions depending on their perceptions. One such emotion is fear, an unfriendly emotional state that is generated by the sensitivity of an aggressive stimulus. Fear may guide individuals to engage in precautionary measures. However, it is unclear how exactly this may be happening, or what amount of fear would be enough, and what mechanisms may be responsible for translating fear into precautionary actions (11).

The huge number of rumors and wrong information circulating worldwide about COVID-19 is progressively increasing. These myths quickly spread because they directly speak to the fears people already have. Physicians, who are considered the main victims of fear due to directly dealing with COVID-19 patients, can also be the main victims of myths related to this disease (12).

There is a lot of information about coronavirus, but not all is true (13). Most people believed that COVID-19 is a stigmatized disease despite the efforts of COVID risk communication and public education (14). Misconception can be present in different levels of a community. Some people believed that wearing a surgical mask is most effective, and eating from a Chinese restaurant is highly risky of acquiring the virus (15).

A study in Jeddah, Saudi Arabia, noted that social media was the main source for knowledge regarding COVID-19, and more than two-thirds of the general Saudi population had misconceptions regarding the disease (16). Isah et al. (17) argued that misconceptions provoke fears, have

negative consequences on the short- and long-term control efforts against the disease, and are one of the health hazards in the prevention of coronavirus.

Primary care physicians should avoid spread of any misconceptions, verify the sources of any received or shared information, and guide the public to seek correct information through reliable sources. Moreover, it is necessary that fear of COVID-19 be scientifically assessed. A robust, psychometrically valid, and dependable tool for evaluating fear of COVID-19 needs to be put in place. Such a psychometrically sound tool would be instrumental in properly gauging human behavioral responses to this pandemic and would also help enlighten public health policies and practices.

The assessment of fears and misconceptions related to COVID-19 among physicians would aid public health decisions and practice in several ways and better policies could be put in place and subsequently implemented (18). However, to the best of the researcher's knowledge, there are no studies identifying misconceptions or assessing the fears of healthcare professionals in Saudi Arabia toward COVID-19.

### Aim of study

The aim of this research is to identify primary care physicians' misconceptions regarding COVID-19, and to assess their fear toward COVID-19.

### Study objectives

- To identify common misconceptions related to COVID-19 among primary care physicians in Aseer Region, 2021.
- To assess fears related to COVID-19 among primary care physicians in Aseer Region, 2021.
- To explore risk factors associated with fears related to COVID-19 among primary care physicians in Aseer Region, 2021.

## Material and Methods

Following an analytical cross-sectional design, this study was conducted in primary health care centers located in the major cities of Aseer Region, i.e., Abha, Khamis Mushayt and Ahad Rufeida, which lie within the southwestern part of the Kingdom of Saudi Arabia. In Abha City, there are 138 PHC physicians in 47 Ministry of Health PHC centers. In Ahad Rufeida City, there are 36 PHC physicians in 11 Ministry of Health PHC centers. In Khamis Mushayt, there are 46 PHC physicians in Ministry of Health PHC centers. Therefore, the total targeted number of PHC physicians in the study area was 220 PHC physicians.

### Data collection tools

**1-** Personal characteristics questionnaire: Age, gender and nationality, qualification, and years of experience in primary health care, participation in vaccination campaigns against COVID-19, contact with COVID-19 cases, and main sources of information regarding COVID-19.

**2-** Misconceptions about COVID-19: Based on review of relevant literature (12; 16-17), a list of 20 misconceptions and false myths were prepared, for which respondents should answer by: "Agree", "Disagree", or "Do not know".

**3-** The English version of the Fear of COVID-19 Scale (FCV-19S) (19): This validated 7-item scale has robust psychometric properties. The scale displayed sound concurrent validity and is associated with adherence to public health messages that aim to reduce the spread of COVID-19. It has high internal consistency coefficient ( $X^2=0.91$ ) and test-retest reliability (Pearson  $r=0.93$ ) (11). Response to items was on a five-point Likert scale (1 = strongly disagree; 5 = strongly agree). A higher level of fear toward COVID-19 is indicated by the higher FCV-19S score.

The FCV-19S has been found to be psychometrically sound in assessing fear of COVID-19 in different populations, including different ethnic groups (20-24).

Research data were collected through Google Forms. The Google Form link containing a brief description of the study, socio-demographic questions, misconceptions as well as the FCV-19S was sent to primary care physicians in Aseer Region.

#### Administrative and ethical considerations

All the necessary official permissions were fully secured before data collection. The personal consent of physicians was requested prior to distribution of the data collection tools. They were clearly informed that their participation in this study is completely optional.

#### Statistical analysis

The Statistical Package for Social Sciences (IBM, SPSS version 25.0) was used for data entry and analysis. Descriptive statistics were calculated and the appropriate test of significance (i.e.,  $X^2$  test) was applied. Pearson's correlation coefficients between misconception and fear of COVID-19 scores were calculated. The significance level was set at  $p<0.05$ .

## Results

Table (1) shows that about two-thirds of participant PHC physicians (63.9%) were aged 30-40 years. Most PHC physicians (69.1%) were males, and Saudi (81.7%). Almost half of the physicians (46%) were MBBS qualified, while 36.1% had a Doctorate degree or a Fellowship. About one-third of physicians (37.5%) had <5 years' experience in PHC.

Table (2) shows that 38.6% of PHC physicians in Aseer participated in campaigns for vaccinations against COVID-19. About half of the participants (49.5%) have come into contact with a COVID-19 case. At the time of data collection, about half of PHC physicians (49.3%) have received two doses of Pfizer-BioNTech, 21.6% have received two doses of Oxford/AstraZeneca, and 24.9% have received one dose of Oxford/AstraZeneca and another of Pfizer-

BioNTech, while 4.3% have received three doses of Pfizer-BioNTech. Results of PCR for COVID-19 were positive for 17.9% of PHC physicians.

Table (3) shows that, regarding the most prevalent misconceptions among PHC physicians in Aseer were that 35.9% believed that wearing a facemask is sufficient to protect from being infected with COVID-19; and 23.5% agreed that some foods can cause COVID-19 infection. The least prevalent misconceptions among PHC physicians were that vaccines against COVID-19 might cause infertility (2.7%); and some vaccines are dangerous (2.9%).

Figure (1) shows that 10.5% of primary care physicians did not have any misconceptions regarding COVID-19, while 53.6% had low misconceptions and 35.9% had high misconceptions.

Table (4) shows that primary healthcare physicians' main sources of information about COVID-19 were the social media (58.1%), followed by the Internet (55.5%), and mass media (47%). However, medical journals, conferences and colleagues constituted the main sources for 41.2%, 36.3% and 28.2% of PHC physicians, respectively.

Table (5) shows that primary care physicians' highest agreements regarding their fears from COVID-19 were related to Q2: *It makes me uncomfortable to think about COVID-19* (15.3% strongly agreed and 37.1% agreed), followed by Q5: *When watching news and stories about COVID-19 on social media, I become nervous or anxious* (13.2% strongly agreed and 32.4% agreed) and Q3: *Sometimes my hands become clammy when I think about COVID-19* (7.4% strongly agreed and 35.3% agreed).

Figure (2) shows that more than half of primary care physicians (50.1%) had high grades of fears of COVID-19.

Figure (3) shows that primary care physicians' misconceptions scores significantly and positively correlated with their COVID-19 fears scores ( $r=0.425$ ,  $p<0.001$ ).

Table (6) shows that the least percentages of high misconceptions regarding COVID-19 were present among primary care physicians aged > 40 years (34%), males (34.6%), Saudi (33%), with MD/Fellowship highest qualifications (28.5%), and those with >10 years' experience in PHC. Differences in grades of misconceptions among PHC physicians differed significantly according to their nationality ( $p=0.003$ ), but did not differ significantly according to any other personal characteristics.

Table (7) shows that the absence of misconceptions related to COVID-19 was significantly higher among PHC physicians who participated in vaccination campaigns against COVID-19 than among those who did not (15.6% and 7.3%, respectively,  $p=0.006$ ). Similarly, the absence of misconceptions related to COVID-19 was significantly

higher among PHC physicians who had contact with COVID-19 cases than among those who did not (12.4% and 7.7%, respectively,  $p=0.002$ ). Moreover, the absence of misconceptions related to COVID-19 was highest among PHC physicians who received 3 doses of the Pfizer vaccine than those who received other types of vaccine doses,  $p<0.001$ ). In addition, PHC physicians who had positive results of PCR for COVID-19 had the highest percentage of no misconceptions related to COVID-19 ( $p=0.010$ ).

Table (8) shows that the youngest PHC physicians (aged <30 years) had significantly the highest grades of high fear toward COVID-19 (58.4%,  $p<0.001$ ). Female PHC physicians had significantly more high fear grade toward COVID-19 than males (56.6% and 47.2%, respectively,  $p=0.048$ ). Non-Saudi PHC physicians had more high fear grade toward COVID-19 than Saudi PHC physicians (49.9% and 51.1%, respectively). However, difference in grades of fear of COVID-19 did not differ significantly according to PHC physicians' nationality. PHC physicians with Diploma/Master qualifications had the highest high fear grade toward COVID-19 (55.4%). However, difference in grades of fear toward COVID-19 did not differ significantly according to PHC physicians' qualifications. PHC physicians with least experience in PHC (i.e., <5 years) had the highest high fear grade toward COVID-19 (56%). However, difference in grades of fear toward COVID-19 did not differ significantly according to their experience.

Table (9) shows that PHC physicians who did not participate in vaccination campaigns against COVID-19 had significantly higher grades of high fear toward COVID-19 than those who did (59.5% and 35.2%, respectively,  $p<0.001$ ). Similarly, PHC physicians who did not come into contact with a COVID-19 case had significantly higher grades of high fear of COVID-19 than those who did (65.6% and 39.5%, respectively,  $p<0.001$ ). PHC physicians who received two doses of the AstraZeneca vaccine had the highest percentage of high fear grade of COVID-19 (55%). However, difference in grades of fear of COVID-19 did not differ significantly according to received vaccine doses. PHC physicians who did not perform PCR for COVID-19 had significantly the highest percentage of high fear grade of COVID-19 (61.1%,  $p<0.001$ ).



Table 1: Personal characteristics of participant PHC physicians

Personal characteristics	No.	%
Age groups		
• <30 years	89	17.3
• 30-40 years	329	63.9
• >40 years	97	18.8
Gender		
• Male	356	69.1
• Female	159	30.9
Nationality		
• Saudi	421	81.7
• Non-Saudi	94	18.3
Highest qualification		
• MBBS	237	46.0
• Diploma/Master	92	17.9
• MD/Fellowship	186	36.1
Experience in primary healthcare		
• <5 years	193	37.5
• 5-10 years	211	41.0
• >10 years	111	21.6

Table 2: Primary healthcare physicians' direct relations with COVID-19 (n=515)

Relation	No.	%
Participation in vaccination campaigns against COVID-19	199	38.6
Ever coming into contact with a COVID-19 case	306	49.5
Which vaccines against COVID-19 have been received:		
• 3 doses of Pfizer-BioNTech	22	4.3
• One dose of Oxford/AstraZeneca and another of Pfizer-BioNTech	128	24.9
• Two doses of Oxford/AstraZeneca	111	21.6
• Two doses of Pfizer-BioNTech	254	49.3
Performing PCR for COVID-19		
• No	208	40.4
• Yes,	307	59.6
• The result was negative for COVID-19	215	41.7
• The result was positive for COVID-19	92	17.9

Table 3: Common misconceptions related to COVID-19 among primary care physicians in Aseer Region (n=515)

Misconceptions	Agree		Disagree		Do not know	
	No.	%	No.	%	No.	%
Younger people are less infected by COVID-19	106	20.6	295	57.3	114	22.1
Wearing a facemask is sufficient to protect from being infected with COVID-19	185	35.9	217	42.1	113	21.9
Hot drinks can kill the virus	109	21.2	292	56.7	114	22.1
Some foods (e.g., Chinese food) cause COVID-19 infection	121	23.5	247	48.0	147	28.5
COVID-19 virus is transmitted in hot and humid climates more than cold climates	112	21.7	255	49.5	148	28.7
Spraying alcohol and chlorine all over your body protects against COVID-19 infection	65	12.6	344	66.8	106	20.6
Taking hot baths can prevent COVID-19 infection	26	5.0	371	72.0	118	22.9
COVID-19 vaccines were rushed and it is early to know for sure about their safety	110	21.4	261	50.7	144	28.0
Vaccines against COVID-19 might cause infertility	14	2.7	331	64.3	170	33.0
Many people have already died from the COVID-19 vaccine	42	8.2	345	67.0	128	24.9
Getting the vaccine during pregnancy may lead to miscarriage	41	8.0	312	60.6	162	31.5
Breastfeeding after getting vaccinated may harm the baby	18	3.5	352	68.3	145	28.2
The COVID-19 vaccine will change your DNA	19	3.7	368	71.5	128	24.9
People previously infected with COVID-19 become immune do not need to get the vaccine	27	5.2	390	75.7	98	19.0
Wearing a surgical mask fully prevents against infection	50	9.7	367	71.3	98	19.0
Some vaccines, (e.g., the Astra-Zeneca) are dangerous	15	2.9	380	73.8	120	23.3
Some vaccines, (e.g., Pfizer-BioNTech) may contain harmful micro-chips	20	3.9	344	66.8	151	29.3
Fully vaccinated people do not have to wear masks	70	13.6	334	64.9	111	21.6
5G mobile networks help spread COVID-19 infection	27	5.2	373	72.4	115	22.3
Some antibiotics (e.g., Azithromycin) can protect against COVID-19 infection	35	6.8	352	68.3	128	24.9

Table 4: Participants' main sources of information regarding COVID-19

Sources of information	No.	%
Social media	299	58.1
Internet	286	55.5
Mass media	242	47.0
Medical journals	212	41.2
Conferences	187	36.3
Colleagues	145	28.2
Others	16	3.1

**Table 5: Primary care physicians' responses regarding their fears toward COVID-19**

	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	No.	%	No.	%	No.	%	No.	%	No.	%
Q1	72	14.0	148	28.7	221	42.9	16	3.1	58	11.3
Q2	79	15.3	191	37.1	178	34.6	22	4.3	45	8.7
Q3	46	8.9	189	36.7	141	27.4	15	2.9	124	24.1
Q4	38	7.4	182	35.3	180	35.0	25	4.9	90	17.5
Q5	68	13.2	167	32.4	158	30.7	27	5.2	95	18.4
Q6	40	7.8	191	37.1	124	24.1	12	2.3	148	28.7
Q7	29	5.6	172	33.4	136	26.4	27	5.2	151	29.3

Q1: I am most afraid of COVID-19

Q2: It makes me uncomfortable to think about COVID-19

Q3: Sometimes my hands become clammy when I think about COVID-19

Q4: I am afraid of losing my life because of COVID-19

Q5: When watching news and stories about COVID-19 on social media, I become nervous or anxious

Q6: Sometimes I cannot sleep due to worries about getting COVID-19

Q7: I frequently feel my heart palpitates when I think about getting infected with COVID-19

**Table 6: Participant PHC physicians' grades of misconceptions regarding COVID-19 according to their personal characteristics**

Personal characteristics	No (n=54)		Low (n=276)		High (n=185)		P Value
	No.	%	No.	%	No.	%	
Age groups							0.562
• <30 years	6	6.7	52	58.4	31	34.8	
• 30-40 years	39	11.9	169	51.4	121	36.8	
• >40 years	9	9.3	55	56.7	33	34.0	
Gender							0.407
• Male	41	11.5	192	53.9	123	34.6	
• Female	13	8.2	84	52.8	62	39.0	
Nationality							0.003†
• Saudi	51	12.1	231	54.9	139	33.0	
• Non-Saudi	3	3.2	45	47.9	46	48.9	
Highest qualification							0.057
• MBBS	22	9.2	124	52.3	91	38.4	
• Diploma/Master	11	12.0	40	43.5	41	44.6	
• MD/Fellowship	21	11.3	112	60.2	53	28.5	
Experience in PHC							0.074
• <5 years	14	7.3	111	57.5	68	35.2	
• 5-10 years	24	11.4	102	48.3	85	40.3	
• >10 years	16	14.4	63	56.8	32	28.8	

† Statistically significant

Table 7: Participant PHC physicians' grades of misconceptions according to their direct relations with COVID-19

Relation with COVID-19	No (n=54)		Low (n=276)		High (n=185)		P Value
	No.	%	No.	%	No.	%	
Participation in vaccination campaigns							
• No	23	7.3	181	57.3	112	35.4	0.006†
• Yes	31	15.6	95	47.7	73	36.7	
Contact with a COVID-19 case							
• No	16	7.7	100	47.8	93	44.5	0.002†
• Yes	38	12.4	176	57.5	92	30.1	
Received doses of vaccines							
• 3 doses of Pfizer	4	18.2	7	31.8	11	50.0	<0.001†
• 1 dose AstraZeneca and 1 Pfizer	12	9.4	83	64.8	33	25.8	
• 2 doses of AstraZeneca	6	5.4	73	65.8	32	28.8	
• 2 doses of Pfizer	32	12.6	113	44.4	109	42.9	
Performing PCR for COVID-19							
• No	15	7.2	101	48.6	92	44.2	0.010†
• Yes, the result was negative	26	12.1	127	59.1	62	28.8	
• Yes, the result was positive	13	14.1	48	52.2	31	33.7	

† Statistically significant

Table 8: Participant PHC physicians' grades of fear toward COVID-19 according to their personal characteristics

Personal characteristics	Low (n=257)		High (n=258)		P Value
	No.	%	No.	%	
Age groups					
• <30 years	37	41.6	52	58.4	<0.001†
• 30-40 years	154	46.8	175	53.2	
• >40 years	66	68.0	31	32.0	
Gender					
• Male	188	52.8	168	47.2	0.048†
• Female	69	43.4	90	56.6	
Nationality					
• Saudi	211	50.1	210	49.9	0.836
• Non-Saudi	46	48.9	48	51.1	
Highest qualification					
• MBBS	115	48.5	122	51.5	0.263
• Diploma/Master	41	44.6	51	55.4	
• MD/Fellowship	101	54.3	85	45.7	
Experience in PHC					
• <5 years	85	44.0	108	56.0	0.118
• 5-10 years	112	53.1	99	46.9	
• >10 years	60	54.1	51	45.9	

† Statistically significant



**Table 9: Participant PHC physicians' grades of fear toward COVID-19 according to their direct relations with COVID-19**

Relation with COVID-19	Low (n=257)		High (n=258)		P Value
	No.	%	No.	%	
Participation in vaccination campaigns					
• No	128	40.5	188	59.5	<0.001†
• Yes	129	64.8	70	35.2	
Coming into contact with a COVID-19 case					
• No	72	34.4	137	65.6	<0.001†
• Yes	185	60.5	121	39.5	
Which vaccines have been received:					
• 3 doses of Pfizer	12	54.5	10	45.5	0.580
• 1 dose of AstraZeneca and another of Pfizer	62	48.4	66	51.6	
• 2 doses of AstraZeneca	50	45.0	61	55.0	
• 2 doses of Pfizer	133	52.4	121	47.6	
Performing PCR for COVID-19					
• No	81	38.9	127	61.1	<0.001†
• Yes, the result was negative	116	54.0	99	46.0	
• Yes, the result was positive	60	65.2	32	34.8	

† Statistically significant

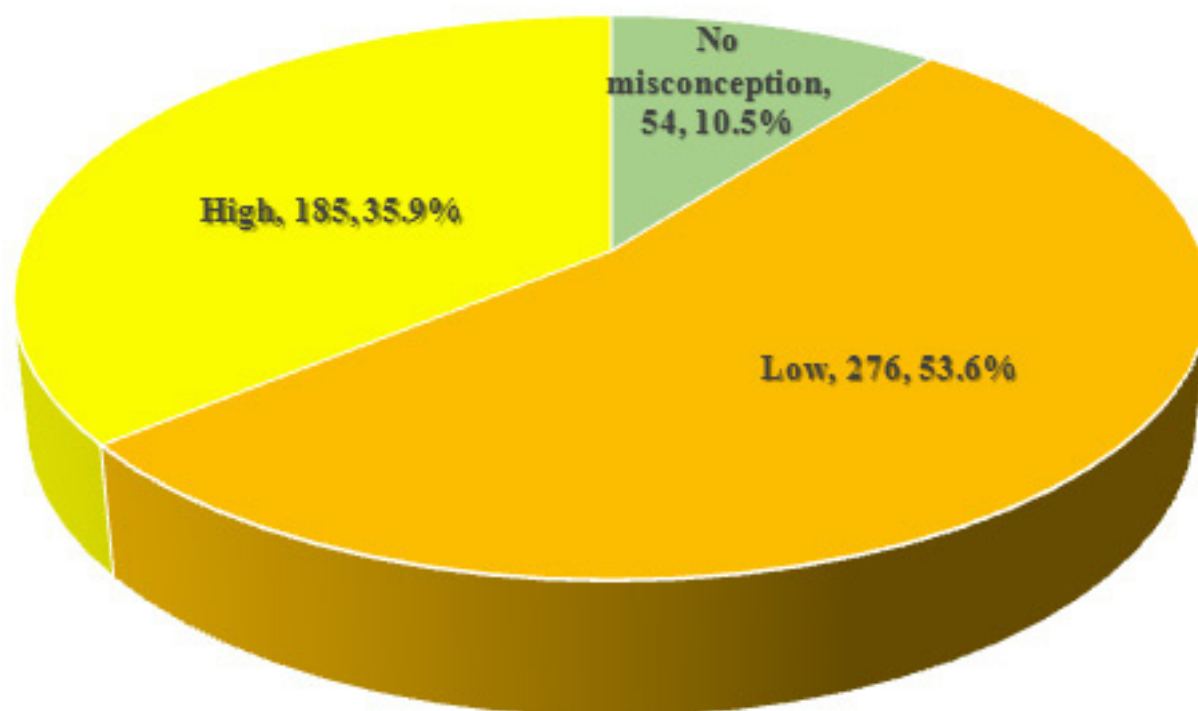
**Figure 1: Grades of primary care physicians' misconception**

Figure 2: Grades of primary care physicians' fear of COVID-19

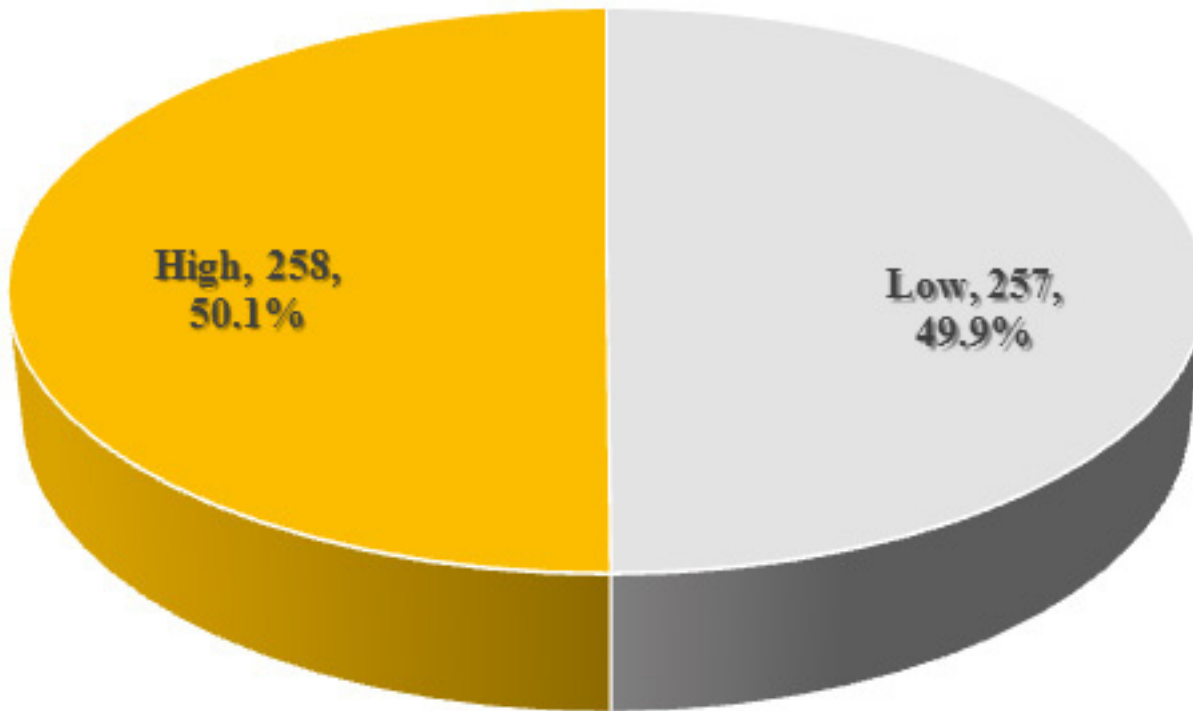
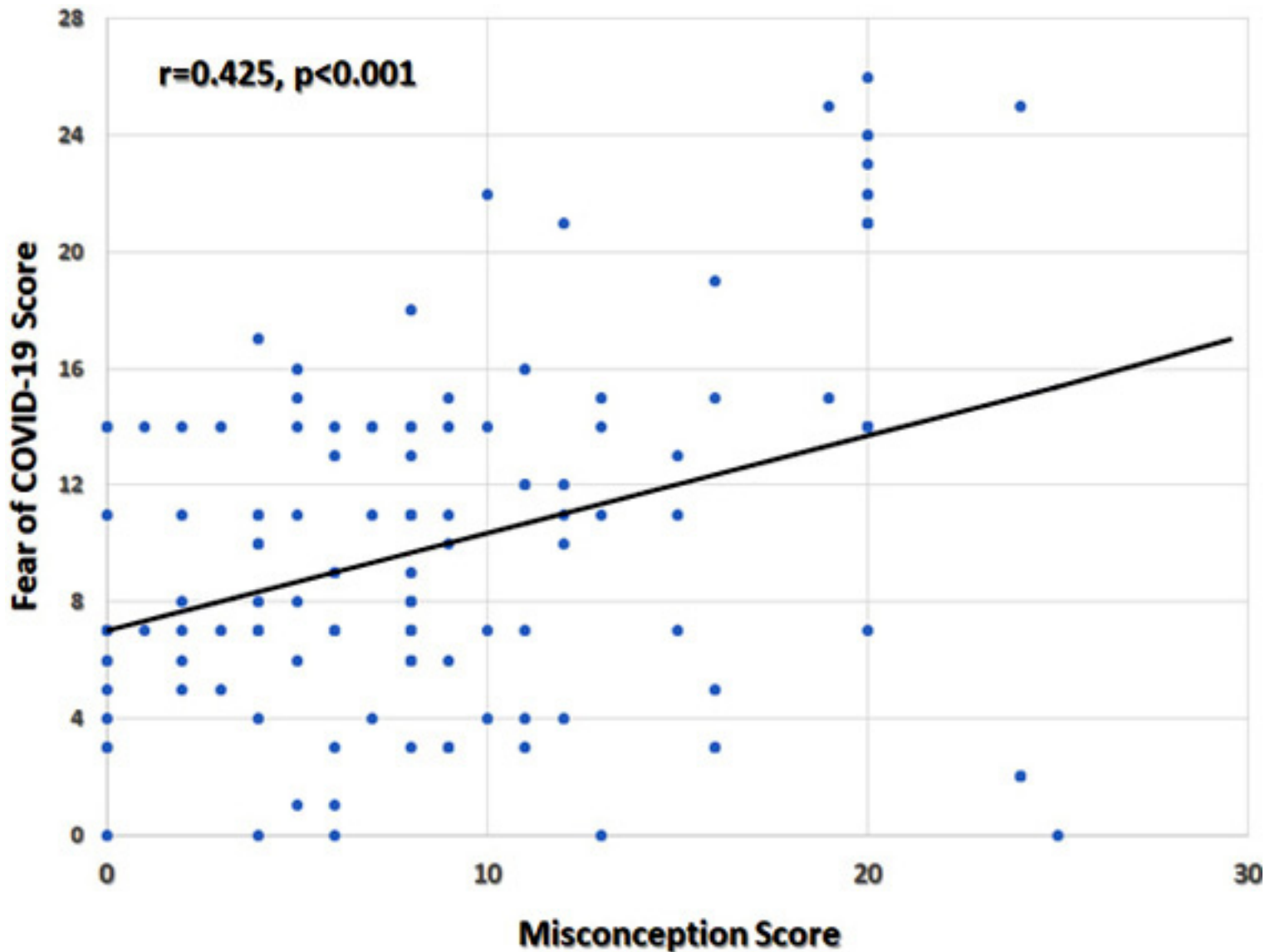


Figure 3: Correlation between Misconception and Fear of COVID-19 scores



## Discussion

Since its first reported case in December 2019, a lot has been discovered about the fight against COVID-19. However, a lot remains unclear, misconceptions and misinformation have been widely spread (25) and have continued to flourish within the widespread fear, limited confidence, and trust (26).

Therefore, the present study aimed to identify common misconceptions and fears related to COVID-19 among primary care physicians in Aseer Region.

Results of the present study indicated that despite all PHC physicians receiving the necessary doses of vaccines against COVID-19, they remain at a high risk of being infected, since almost half of participants have come into contact with COVID-19 patients, and 59.6% have performed PCR, of whom 17.9% were positive for COVID-19.

These findings are in accordance with those reported by Lau et al. (27), who noted that most primary care physicians are considered at high risk of COVID-19 infection (89.9%). However, most of them willingly accept to deal with this risk (91.1%) and to care for their COVID-19 patients (85.4%). Therefore, healthcare facilities should continue to give support to physicians by managing their psychosocial worries (e.g., fears and stresses) and professional needs (e.g., vaccines).

The present study revealed that only 10.5% of PHC physicians had no misconceptions about COVID-19, while 35.9% had more than 10 misconceptions. The most frequently stated misconceptions were that wearing a facemask fully protects from being infected; and that certain food types (e.g., Chinese foods) can cause COVID-19 infection.

High prevalence of misconceptions related to COVID-19 were reported by several other studies. In Jeddah, Saudi Arabia, Baig et al. (16) found a misconception rate of 66.9%, while in Katsina State, Nigeria, Isah (17) reported that 83% of participants had at least one misconception. Geldsetzer (15) noted that some people believed that wearing a surgical mask is most effective, while eating in a Chinese restaurant can be highly risky of becoming infected.

The high prevalence of misconceptions among PHC physicians may be explained by the finding that social media and the internet were the main sources for their information regarding COVID-19.

Kaplan and Mazurek (28) argued that, one of the main information sources via the internet that has revolutionized the world is social media. These are online platforms on which user-generated contents can be shared. Recently, social media are being used as a popular source for evidence-based information on health (29), which could also be used to spread misinformation (30). Joshi et al.

(31) stressed that social media became a popular place to conduct rumors in public health, which can impede health interventions. It has been noted that during crises and health emergencies, e.g., during the COVID-19 pandemic, the general public have progressively used social media, such as during the COVID-19 pandemic. Therefore, social media is a suitable platform for distribution of misconceptions about COVID-19 (32).

In Saudi Arabia, Baig et al. (16) found that the leading source of information about COVID-19 was social media, followed by governmental websites, TV, and mass media. However, social media can provide substantial misinformation and misconceptions, frequently described as information that conflicts with existing evidence from healthcare specialists (33).

It is worrying that the main source of PHC physicians' information about COVID-19 in the present study was the social media. Therefore, PHC physicians should search for information about COVID-19 from reliable resources, such as the World Health Organization, the Centers for Disease Control, and the Ministry of Health portals.

Results of this study indicated that more than half of PHC physicians had high fears of COVID-19, and the extent of these fears significantly and positively correlated with their extent of misconceptions about COVID-19.

Our findings are in accordance with those of Bakri and El-Setouhy (34), in Jazan, Saudi Arabia, who reported that more than half of PHC physicians experienced corona phobia. Asmundson and Taylor (35) noted that such symptoms of fear were shown to progress to full-blown COVID-19 stress syndrome as the pandemic progressed. Lee and Crunk (36) stated that corona phobia is one of the main factors, beside neuroticism and hypochondriasis, that worsen the burden of COVID-19-related psychological distress. However, how pandemic-related distress develops among healthcare professional remains a very complex process that involves aspects of fearful attachment and emotional stability personality traits (37).

Corona phobia and fear of COVID-19 were recognized as significant fears as soon as the current pandemic started. Fear, anxiety, and worry were part of the new normal created by the successive waves of different variants of the coronavirus (38). Healthcare workers, especially those working as frontline staff, are at increased risk of corona phobia (39).

Our results revealed that the least percentages of high misconceptions regarding COVID-19 were present among older PHC physicians (aged > 40 years), males, those who were MD/Fellowship qualified, and those with highest experience in PHC (>10 years), with no significant differences in grades of misconceptions according to personal characteristics. However, grades of misconceptions among PHC physicians differed significantly according to their nationality, being significantly less among Saudi physicians. Moreover, the

least percentages of misconceptions related to COVID-19 among PHC physicians were significantly more among those who participated in vaccination campaigns against COVID-19, those who had contact with COVID-19 cases, and those who received three doses of the Pfizer vaccine, in addition to those who had positive results of PCR for COVID-19.

Our results also showed that females and young PHC physicians, in addition to those who did not perform PCR for COVID-19 had significantly more high fear of COVID-19. In addition, more fears were observed among non-Saudi physicians, those with Diploma/Master qualifications and those with least experience in PHC, but differences in their grades of fear did not differ significantly according to their personal characteristics. Moreover, significantly higher fears were observed among PHC physicians who did not participate in vaccination campaigns against COVID-19 and those who did not come into contact with a COVID-19 case. Moreover, PHC physicians who received two doses of the AstraZeneca vaccine had the highest percentage of high fear grade toward COVID-19, but difference in grades of fear toward COVID-19 did not differ significantly.

These findings possibly reflect that misconceptions, and consequently lower grades of fear regarding COVID-19, are usually less among those with more experience and qualification in PHC and that the Saudi physicians are better informed and have less fears than foreign physicians regarding COVID-19.

Tabong and Segtub (32) emphasized that lack of reliable information sources about COVID-19 and the presence of doubt about the information provided from official health authorities accounts for the widespread misconceptions and fears. Lau et al. (27) added that continued access to information about COVID-19, provision of definite infection prevention and control guidelines, and the availability of personal protective measures, with reliable supply of personal protective equipment are the most important factors that help PHC physicians to cope with their fears during the current pandemic.

It is worrying to realize that misconceptions and fears regarding COVID-19 are high among PHC physicians in Aseer Region, despite the fact that the Saudi Ministry of Health has been very professionally working, and its portal regularly and continuously updates information regarding COVID-19 (16). Therefore, it is necessary that the Saudi Ministry of Health continue providing all PHC physicians with latest up-to-date information and continuing medical education regarding COVID-19, to minimize spread of misconceptions and concerns regarding COVID-19 among physicians that will be positively reflected upon the public.

## Conclusions

Misconceptions and fears regarding COVID-19 are common among PHC physicians in Aseer Region. Social media is the main source of health information regarding COVID-19. Fear among PHC physicians is significantly and positively correlated with their misconceptions. Misconceptions are significantly less among Saudi physicians, those who participated in vaccination campaigns against COVID-19, those who had contact with COVID-19 cases, those who received three doses of the Pfizer vaccine, and those who had positive results of PCR for COVID-19. Moreover, PHC physicians who are females, young, did not participate in vaccination campaigns against COVID-19, did not come into contact with COVID-19 cases, and did not perform PCR for COVID-19 have significantly high fears toward COVID-19.

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