

Psychological Distress, Fear, and Coping Strategies among Citizens and Residents in Saudi Arabia During the COVID-19 Pandemic

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Abstract

Background: COVID-19 caused the worst international public health crisis, accompanied by major global economic downturns, mass-scale job losses, which impacted on the psychosocial wellbeing of the worldwide population. This study examined factors associated with psychosocial distress, fear of COVID-19 and coping strategies amongst the general population in Saudi Arabia.

Methods: A cross-sectional study was conducted using an anonymous online questionnaire. Multivariate logistic regressions were used; Adjusted Odds Ratio (AOR) with 95% Confidence Intervals (CIs) was reported.

Results: Among 803 participants, 70 % (n=556), were females and the median age was 27 years; 35% (n=278), were frontline or essential service workers; 24% (n=195), reported comorbid conditions including mental health illness. Factors associated with moderate to high levels of psychological distress were: youth (18 - 29 years) (AOR 3.35, 95% CIs 2.06 - 5.44), females (2.59, 1.60 - 4.19), non-Saudi nationals (2.17, 1.11 - 4.26), change in employment (2.9, 1.73 - 4.87), negative financial impact (2.14, 1.29-3.56), having comorbidities (2.67, 1.47 - 4.87), and current smoking (2.87, 1.55 - 5.33). Being ex-smokers (3.72, 1.14 - 12.14) and change in employment (3.42, 1.91 - 6.11) were associated with higher levels of fear of COVID-19. People whose financial situation was impacted and who had contact with known/suspected cases (1.63, 1.12-2.38) had low medium to high resilient coping.

Conclusions: People in Saudi Arabia were at a higher risk of psychosocial distress and fear along with low resilience during the COVID-19 pandemic, warranting urgent attention from healthcare providers and policymakers, to provide specific mental health support strategies for their wellbeing currently and to avoid a post-pandemic mental health crisis.

Background

The COVID-19 disease, since its outbreak in China, has spread widely affecting more than 213 countries and territories around the world. As of mid of August 2021, globally, more than 200 million people have tested positive for coronavirus infection, with more than four million fatalities [1]. COVID-19 caused the worst international health crisis of recent times, accompanied by a major global economic downturn, mass-scale job losses, all of them leading to psycho-social issues among people. Countries were forced to adopt extreme measures such as quarantine or self-isolation of the infected and their close contacts, prevent the public gathering, closing schools and universities, travel bans, closing territorial and international borders and in some cases, forcing complete lockdown of cities [2].

In Saudi Arabia, the first Covid-19 positive case was identified in the first week of March 2020 [3]. As mid of August 2021, Saudi Arabia has recorded 536,693 cases, with 8378 fatalities [1]. The lower fatality rate of 1.7% in Saudi Arabia compared with the international rate of 3.2% indicates that Saudi Arabia has handled the crisis relatively better than other countries [4]. The authorities in Saudi Arabia responded to the pandemic rapidly and imposed several measures to reduce the spread of the infection: closed all

borders and suspended international flights and internal transports, including pilgrimages to the Prophet's Mosque in Madinah, an unprecedented decision since 1858 [5]. Curfew was imposed for several hours a day in many cities, together with the closure of schools and workplaces and cancellation of larger social and religious events and services [5]. Furthermore, a national campaign of mass screening was initiated, where people with COVID-19 like symptoms were screened, along with their close contacts [6]. Those who returned a positive Polymerase Chain Reaction (PCR) test had to undergo mandatory 14-day quarantine [7]. In addition, arriving travellers were initially required to undergo institutional quarantine.

Saudi citizens and residents were regularly updated with the latest news and preventive measures by text messages [8, 9]. The supply of essential goods, such as food and medicine, was ensured by home delivery.

Reports from several countries have indicated that the drastic but unavoidable measures taken to prevent the spread of COVID-19 have deeply impacted people's lifestyles, with negative physical and mental health consequences [9–11]. There has been widespread anxiety and distress in all affected countries, arising from prolonged self-isolation and quarantine, infection fears, frustration, boredom, shortage of essential supplies, inadequate information, and financial losses [12]. Even in countries such as Australia, where the infection and case fatality rate was very low, compared to other developed countries such as the USA or UK, people were distressed because of the potential to be infected with the virus, even without close contact with an infected person and the rapid spread within the communities [13, 14].

Depoux, Martin [15] warned of the possibilities of adverse psychosomatic outcomes among people due to the pandemic, which is likely to be compounded by the constant flow of information (sometimes, misinformation) via online and various forms of social media. It is feared that the rapidly expanding mass hysteria and panic regarding COVID-19 may lead to long-term psychological problems among people, regardless of their socioeconomic status [15]. The limited studies on the impact of pandemics on society concerning previous experiences such as SARS, have pointed to many stressors linked to disease outbreaks and pandemics [16, 17]. Few studies have examined the factors associated with mental wellbeing within Saudi Arabia and a study focused on the psychological impact of COVID-19 in Bahrain [7] and the United Arab Emirates [18]. A Saudi survey reports that 19.6% of 3017 respondents had moderate to severe anxiety levels during the pandemic [19]. Another study reported the occurrence of moderate or severe psychological impact among 23.6% of respondents [20]. Regarding residents in Saudi Arabia, most of them are temporary workers, mainly from low-income and middle-income countries. It is well documented that COVID-19 related deaths and infections had been disproportionately high among them compared to a high-income country like Saudi Arabia [2]. Previous research from Saudi Arabia examined the psychological impact among healthcare workers [21, 22]. However, the present study aimed at examining the factors associated with psychosocial distress, fear of COVID-19 and coping strategies amongst the general population of Saudi Arabia.

Methods

Aim of the study

This study aimed to examine the factors associated with psychosocial distress, fear of COVID-19 and coping strategies amongst the general population in Saudi Arabia.

Study design and settings

This cross-sectional study was conducted among the general population Saudi Arabia. The study was conducted over 30 days, from 15th December 2020 to 15th January 2021. The participants were aged between 18 and 65 years old. The questionnaire was designed in accordance with the previously published literature and the survey was pre-tested for validation amongst migrants and non-migrants [14, 23]. The present study used same methods and tools that used The survey was conducted in Arabic and English and took about 15 minutes to be completed. The present study used same methods and tools that used for the previous studies [14, 24].

Study population and sample size

The study population included people residing in Saudi Arabia (irrespective of nationality), ≥ 18 years old and could respond to either Arabic or English questionnaires on an online platform. This included including patients, frontline health and other essential service workers, and general community members. Snowball sampling was used to select study participants, so that the respondents could forward the survey link to their personal and professional networks. OpenEpi software was used to calculate the sample size. Considering 35.3 million populations in Saudi Arabia [25] assuming 50% prevalence of stress among the people, at 95% confidence intervals and 80% power, the estimated minimum sample size was 385.

Data Collection

An online link in Arabic and English was created with a structured survey questionnaire using the Google form. The plain language information statement and the informed consent form appeared on the first screen. Only the participants, who provided informed consent and agreed to participate in the study, could move to the next screen containing the single eligibility criteria of being an adult. The subsequent screens had the complete study questionnaire. The anonymous questionnaire was introduced, and the invitation, which included an internet link and a QR code, was distributed via social media platforms, online community networks, staff and student email databases of participating universities/hospitals. Participants had the freedom to complete the questionnaire in their free time at home or while waiting to see a doctor. The online survey did not capture any personally identifiable information from them.

Study tool

The structured survey questionnaire was adapted from a previous Australian study conducted for the same objective of this study [14]. Psychological distress was measured using the Kessler Psychological Distress Scale (K-10) [26], fear was measured using the Fear of COVID-19 Scale (FCV-19S) [27], and coping was measured using Brief Resilient Coping Scale (BRCS) [28]. The tools have been recently

examined for reliability and validity and it was found that these tools are valid and reliably amongst both migrant and non-migrant populations in Australia [23].

Ethical Considerations

All participants were requested to sign an informed consent form before filling the questionnaire to register their willingness to participate. All methods were performed in accordance with the relevant guidelines and regulations of the Declaration of Helsinki. Ethical approval was obtained from the Human Research Ethics Committee in King Fahad Medical City, Saudi Arabia (H-01-R-012).

Data Analyses

The database was downloaded from Google form and analyzed using SPSS v.25. Descriptive analyses had been undertaken to describe the study variables. Mean and standard deviations were computed for the continuous variable (age) and each scale (K10, FCV-19S and BRCS), while proportions were reported for categorical variables. To conduct inferential analysis K10 was defined into low (score 10–15) and moderate to very high (score 16–50), FCV-19S scale was categorized into low (score 7–21) or high (score 22–35) and BRCS into low (score 4–13) and medium to high (score 14–20) resilient coping. Cross-tabulation of the factors associated with psychological distress was done by comparing low and moderate to very high distress on the K10 scale. Factors associated with fear of COVID-19 were identified by comparing low and high fear on the FCV-19S scale, and factors associated with coping were identified by comparing low and medium to high resilient coping on the BRCS scale. Multivariable logistic regression analyses were performed to investigate the factors of moderate to very high distress on the K10 scale, high level of fear of COVID-19 on the FCV-19S scale, and medium to high resilient coping on the BRCS scale. Statistical significance was determined by $p < 0.05$. Odds Ratios (ORs) with a 95% confidence interval (CI) was used to assess the strength of the association. Adjusted ORs (AORs) indicated adjustment of potential confounding variables.

Results

A total of 803 individuals, aged ≥ 18 years, living in Saudi Arabia, participated in this study. Table 1 presents the characteristics of the participants. More than half of the participants (57.1%) were younger (18- 29 years) and the majority (69.5%) were females, had a bachelor's degree or above (64.5%), and were living with family (85.8%). More than a third (34.6%) of the participants worked as frontline or essential service workers during the pandemic. Just over a third (33.7%) reported negative financial impact due to COVID-19. Only 16.3% of the participants were current smokers, and more than half (56.5%) of them increased smoking during the pandemic. About a quarter (24.3%) reported pre-existing comorbid conditions including mental health issues (5.6%). About a tenth (8.2%) of the participants had tested positive for COVID-19, while over a tenth (12%) tested negative. More than a third (36.2%) had close contact with confirmed or suspected COVID-19 cases.

Table 1
Characteristics of the study participants

Characteristics	Total n (%)
Total study participants	803
Age in years	
Mean (\pm SD)	29.1 (9.04)
Median	27
Range	18 – 61
Age groups	665
18 - 29 years	380 (57.1)
30 - 39 years	181 (27.2)
40 - 61 years	104 (15.6)
Gender	800
Male	244 (30.5)
Female	556 (69.5)
Educational attainment	800
Grade 1 to grade 6	2 (0.3)
Grade 7 to grade 12	203 (25.4)
Trade/certificate/diploma	79 (9.9)
Bachelor or above	516 (64.5)
Living status	800
Live without family members	114 (14.3)
Live with family members	686 (85.8)
Citizenship	800
Non-Saudi	122 (15.3)
Saudi	678 (84.8)
Current employment status	779
Unemployed	0
Jobs affected by COVID-19 (lost job/working hours reduced/	529 (67.9)

Characteristics	Total n (%)
Jobs unaffected by COVID-19 (employed/Government benefits)	250 (32.1)
Perceived distress due to change of employment status	770
A little to none	497 (64.5)
Moderate to a great deal	273 (35.5)
Frontline or essential service worker (Self-identification)	803
No	525 (65.4)
Yes	278 (34.6)
COVID-19 impacted financial situation	803
No impact	399 (49.7)
Positive impact	133 (16.6)
Negative impact	271 (33.7)
Co-morbidities	803
No	608 (75.7)
Psychiatric/Mental health issues	45 (5.6)
Other co-morbidities*	150 (18.7)
Smoking	
Never smoker	650 (80.9)
Ex-smoker	22 (2.7)
Current smoker	131 (16.3)
Increased smoking over the last 6 months	131
No	57 (43.5)
Yes	74 (56.5)
Contact with known/suspected COVID-19 cases	784
No	500 (63.8)
Yes	284 (36.2)
COVID-19 related experiences	773
No known diagnosis of COVID-19	600 (77.6)

Characteristics	Total n (%)
Tested positive for COVID-19	63 (8.2)
Tested negative for COVID-19 but self-isolating	93 (12.0)
Recent overseas travel history and was in quarantine	17 (2.2)
Healthcare service used to overcome COVID-19 related stress in the past 6 months	770
No	658 (85.5)
Yes	112 (14.5)

Psychological distress

Among the study participants, 72% experienced moderate to very high levels of psychological distress. One in four individuals (25.8%) experienced very high levels of psychological distress (Table 2). After adjusting for the effects of potential confounders, evidence of significant association for moderate to very high psychological distress was observed with age, sex, nationality, perceived distress due to change of employment, the financial impact of COVID-19, having co-morbidities and current smoking. (Table 3).

Table 2
Psychological distress among adults during the COVID-19 pandemic in Saudi Arabia

Anxiety and depression checklist (K10)	Total
	n (%)
About how often did you feel tired for no good reason?	803
None	233 (29.0)
A little	193 (24.0)
Sometime	239 (29.8)
Most of the time	109 (13.6)
All the time	29 (3.6)
About how often did you feel nervous?	803
None	165 (20.5)
A little	218 (27.1)
Sometime	212 (26.4)
Most of the time	146 (18.2)
All the time	62 (7.7)
About how often did you feel so nervous that nothing could calm you down?	803
None	343 (42.7)
A little	178 (22.2)
Sometime	157 (19.6)
Most of the time	79 (9.8)
All the time	46 (5.7)
About how often did you feel hopeless?	803
None	329 (41.0)
A little	190 (23.7)
Sometime	139 (17.3)
Most of the time	95 (11.8)
All the time	50 (6.2)
About how often did you feel restless or fidgety?	803
None	185 (23.0)

Anxiety and depression checklist (K10)	Total
	n (%)
A little	223 (27.8)
Sometime	225 (28)
Most of the time	136 (16.9)
All the time	34 (4.2)
About how often did you feel so restless you could not sit still?	803
None	333 (41.5)
A little	233 (29.0)
Sometime	140 (17.4)
Most of the time	77 (9.6)
All the time	20 (2.5)
About how often did you feel depressed?	803
None	310 (38.6)
A little	211 (26.3)
Sometime	153 (19.1)
Most of the time	90 (11.2)
All the time	39 (4.9)
About how often did you feel that everything was an effort?	803
None	227 (28.3)
A little	237 (29.5)
Sometime	168 (20.9)
Most of the time	89 (11.1)
All the time	82 (10.2)
About how often did you feel so sad that nothing could cheer you up?	803
None	286 (35.6)
A little	205 (25.5)
Sometime	159 (19.8)
Most of the time	92 (11.5)

Anxiety and depression checklist (K10)	Total
	n (%)
All the time	61 (7.6)
About how often did you feel worthless?	803
None	417 (51.9)
A little	148 (18.4)
Sometime	105 (13.1)
Most of the time	71 (8.8)
All the time	62 (7.7)
K10 score (total)	803
Mean (\pm SD)	22.85 (9.88)
Minimum – Maximum	10 to 50
Level of psychological distress (K10 categories)	803
Low (score 10–15)	225 (28.0)
Moderate (score 16–21)	196 (24.4)
High (score 22–29)	175 (21.8)
Very high (score 30–50)	207 (25.8)

Table 3
Factors associated with psychological distress among adults in Saudi Arabia.

Characteristics	n (row %)			P	AOR	95% CI
	Low (score 10 - 15)	Moderate to Very High (score 16–50)	Total			
Age groups						
> 29 years	118 (41.8)	164 (58.2)	282		1	
18 - 29 years	60 (15.8)	320 (84.2)	380	0.000	3.35	2.06 - 5.44
Sex						
Male	107 (43.9)	137 (56.1)	244		1	
Female	118 (21.2)	438 (78.8)	556	0.000	2.59	1.60 - 4.19
Educational attainment						
Grade 1 – 12	37 (18.0)	168 (82.0)	205		1	
Trade/certificate/diploma	36 (45.6)	43 (54.4)	79	0.138	0.51	0.21 - 1.24
Bachelor or above	150 (29.1)	366 (70.9)	516	0.875	0.95	0.53 - 1.71
Living status						
Live without family members	36 (31.6)	78 (68.4)	114			
Live with family members	187 (27.3)	499 (72.7)	686	0.119	1.7	0.87 - 3.32
Nationality						
Saudi	191 (28.2)	487 (71.8)	678		1	
Non-Saudi	33 (27.0)	89 (73.0)	122	0.024	2.17	1.11 - 4.26
Current employment condition						
Job unaffected by COVID-19 (employed/Government benefits)	56 (22.4)	194 (77.6)	250		1	
Job affected by COVID-19 (lost job/working hours reduced/	166 (31.4)	363 (68.6)	529	0.605	0.87	0.51 - 1.48

Characteristics	n (row %)			P	AOR	95% CI
	Low (score 10 - 15)	Moderate to Very High (score 16–50)	Total			
Perceived distress due to change of employment condition						
A little to none	181 (36.4)	316 (63.6)	497		1	
Moderate to a great deal	36 (13.2)	237 (86.8)	273	0.000	2.90	1.73 - 4.87
Frontline or essential service worker (self-identification)						
No	137 (26.1)	388 (73.9)	525		1	
Yes	88 (31.7)	190 (68.3)	278	0.778	0.93	0.57 - 1.52
COVID-19 impacted financial situation						
No impact	134 (33.6)	265 (66.4)	399		1	
Positive impact	37 (27.8)	96 (72.2)	133	0.133	1.55	0.87 - 2.76
Negative impact	54 (19.9)	217 (80.1)	271	0.003	2.14	1.29 - 3.56
Co-morbidities						
No	186 (30.6)	422 (69.4)	608		1	
Psychiatric/Mental health issues	4 (8.9)	41 (91.1)	45	0.091	2.72	0.85 - 8.66
Other co-morbidities	35 (23.3)	115 (76.7)	150	0.001	2.67	1.47 - 4.87
Smoking						
Never smoker	192 (29.5)	458 (70.5)	650		1	
Ex-smoker	8 (36.4)	14 (63.6)	22	0.782	1.18	0.37 - 3.79
Current smoker	25 (19.1)	106 (80.9)	131	0.001	2.87	1.55 - 5.33

Characteristics	n (row %)			P	AOR	95% CI
	Low (score 10 - 15)	Moderate to Very High (score 16–50)	Total			
Contact with known/suspected COVID-19 cases						
No	141 (28.2)	359 (71.8)	500		1	
Yes	77 (27.1)	207 (72.9)	284	0.184	0.73	0.46 - 1.16
COVID-19 related experiences						
No known diagnosis of COVID-19	165 (27.5)	435 (72.5)	600		1	
Tested positive for COVID-19	22 (34.9)	41 (65.1)	63	0.642	0.82	0.36 - 1.88
Tested negative for COVID-19 but self-isolating	26 (28.0)	67 (72.0)	93	0.612	0.84	0.43 - 1.64
Recent overseas travel history and was in quarantine	3 (17.6)	14 (82.4)	17	0.361	2.22	0.40 - 12.28

Fear of COVID-19

Among the participants, one in 10 (11.1%) demonstrated high levels of fear of COVID-19 (Table 4). In the multivariate analyses, it was found that a high level of fear of COVID-19 was significantly associated with perceived distress due to change of employment situation and smoking status. Individuals who perceived moderate to a great deal of distress due to change in employment were 3.42 (95% CI: 1.91 - 6.11) times more likely to experience high levels of fear of COVID-19 compared to the individuals who perceived a little or no distress. Being an ex-smoker was associated with higher levels of anxiety of COVID-19 compared to those who never smoked (AOR .72, 95% CI: 1.14 - 12.14) (Table 5).

Table 4
Fear of COVID-19 among adults in Saudi Arabia

Fear of COVID-19 Scale (FCV-19S) items	Total
	n (%)
I am most afraid of COVID-19	803
Strongly disagree	275 (34.2)
Somewhat disagree	175 (21.8)
Neither agree nor disagree	190 (23.7)
Somewhat agree	138 (17.2)
Strongly agree	25 (3.1)
It makes me uncomfortable to think about COVID-19	803
Strongly disagree	245 (30.5)
Somewhat disagree	162 (20.2)
Neither agree nor disagree	168 (20.9)
Somewhat agree	187 (23.3)
Strongly agree	41 (5.1)
My hands become clammy when I think about COVID-19	803
Strongly disagree	532 (66.3)
Somewhat disagree	160 (19.9)
Neither agree nor disagree	75 (9.3)
Somewhat agree	27 (3.4)
Strongly agree	9 (1.1)
I am afraid of losing my life because of COVID-19	803
Strongly disagree	388 (48.3)
Somewhat disagree	164 (20.4)
Neither agree nor disagree	127 (15.8)
Somewhat agree	84 (10.5)
Strongly agree	40 (5.0)
When watching news and stories about COVID-19 on social media, I become nervous or anxious	803

Fear of COVID-19 Scale (FCV-19S) items	Total
Strongly disagree	269 (33.5)
Somewhat disagree	166 (20.7)
Neither agree nor disagree	173 (21.5)
Somewhat agree	156 (19.4)
Strongly agree	39 (4.9)
I cannot sleep because I'm worrying about getting COVID-19	803
Strongly disagree	554 (69.0)
Somewhat disagree	130 (16.2)
Neither agree nor disagree	87 (10.8)
Somewhat agree	19 (2.4)
Strongly agree	13 (1.6)
My heart races or palpitates when I think about getting COVID-19	803
Strongly disagree	501 (62.4)
Somewhat disagree	145 (18.1)
Neither agree nor disagree	100 (12.5)
Somewhat agree	45 (5.6)
Strongly agree	12 (1.5)
FCV-19S score (total)	803
Mean (\pm SD)	14.01 (6.05)
Minimum – Maximum	7 to 35
Level of fear of COVID-19 (FCV-19S categories)	803
Low (score 7–21)	714 (88.9)
High (score 22–35)	89 (11.1)

Table 5
Factors associated with the fear of COVID-19 among adults in Saudi Arabia

Characteristics	n (row %)			P	AOR	95% CI
	Low (score 7 - 21)	High (score 22 - 35)	Total			
Age groups						
18 - 29 years	339 (89.2)	41 (10.8)	380	0.989	1.00	0.53-1.88
> 29 years	248 (87.0)	37 (13.0)	285	1.000		
Sex						
Male	220 (90.2)	24 (9.8)	244		1	
Female	492 (88.5)	64 (11.5)	556	0.602	1.20	0.61 - 2.38
Educational attainment						
Grade 1 – 12	189 (92.2)	16 (7.8)	205		1	
Trade/certificate/diploma	68 (86.1)	11 (13.9)	79	0.741	1.19	0.42 - 3.42
Bachelor or above	454 (88.0)	62 (12.0)	516	0.879	0.94	0.44 - 2.03
Living status						
Live without family members	90 (78.9)	24 (21.1)	114		1	
Live with family members	621 (90.5)	65 (9.5)	686	0.213	0.61	0.28 - 1.33
Nationality						
Saudi	608 (89.7)	70 (10.3)	678		1	
Non-Saudi	104 (85.2)	18 (14.8)	122	0.600	0.79	0.33 - 1.88
Current employment condition						
Job unaffected by COVID-19 (employed/Government benefits)	227 (90.8)	23 (9.2)	250		1	

Characteristics	n (row %)			P	AOR	95% CI
	Low (score 7 - 21)	High (score 22 - 35)	Total			
Job affected by COVID-19 (lost job/working hours reduced/	464 (87.7)	65 (12.3)	529	0.188	1.58	0.80 - 3.12
Perceived distress due to change of employment condition						
A little to none	462 (93.0)	35 (7)	497			
Moderate to a great deal	219 (80.2)	54 (19.8)	273	0.000	3.42	1.91 - 6.11
Frontline or essential service worker (self-identification)						
No	489 (91.4)	45 (8.6)	525			
Yes	234 (84.2)	44 (15.8)	278	0.062	1.79	0.97 - 3.31
COVID-19 impacted financial situation						
No impact	366 (91.7)	33 (8.3)	399		1	
Positive impact	121 (91.0)	12 (9.0)	133	0.815	1.10	0.50 - 2.44
Negative impact	227 (83.8)	44 (16.2)	271	0.282	1.40	0.76 - 2.59
Co-morbidities						
No	544 (89.5)	64 (10.5)	608		1	
Psychiatric/Mental health issues	40 (88.9)	5 (11.1)	45	0.876	0.92	0.31 - 2.72
Other co-morbidities	130 (86.7)	20 (13.3)	150	0.207	1.55	0.78 - 3.07
Smoking						
Never smoker	587 (90.3)	63 (9.7)	650		1	
Ex-smoker	17 (77.3)	5 (22.7)	22	0.029	3.72	1.14 - 12.14

Characteristics	n (row %)			P	AOR	95% CI
	Low (score 7 - 21)	High (score 22 - 35)	Total			
Current smoker	110 (84.0)	21 (16.0)	131	0.098	1.79	0.90 - 3.55
Contact with known/suspected COVID-19 cases						
No	454 (90.8)	46 (9.2)	500		1	
Yes	245 (86.3)	39 (13.7)	244	0.349	1.32	0.74 - 2.37
COVID-19 related experiences						
No known diagnosis of COVID-19	540 (90.0)	60 (10.0)	600			
Tested positive for COVID-19	55 (87.3)	8 (12.7)	63	0.263	0.54	0.19 - 1.58
Tested negative for COVID-19 but self-isolating	77 (82.8)	16 (17.2)	93	0.860	1.08	0.47 - 2.45
Recent overseas travel history and was in quarantine	12 (70.6)	5 (29.4)	17	0.564	0.52	0.06 - 4.84

Coping strategies

More than half (55.8%) of the participants had medium to high resilient coping (Table 6). Significant association for high resilience coping was observed with perceived distress due to change of employment conditions, the economic impact of the COVID-19 pandemic, and contact with known or suspected cases. Individuals who reported positive (AOR: 1.68, 95% CI: 1.03 - 2.75) or negative economic impact (AOR: 1.82, 95% CI: 1.22 - 2.71) of COVID-19 were more likely to have medium to high resilient coping. In addition, individuals who had contact with confirmed or suspected COVID-19 cases were more likely to have medium to high resilient coping (AOR: 1.63, 95% CI: 1.12 - 2.38). On the other hand, those who perceived distress due to employment changes had low resilient coping (AOR 0.63, 95% CI 0.43-0.92).

Table 6
Coping during COVID-19 pandemic in Saudi Arabia

Brief Resilient Coping Scale (BRCS)	Total
	n (%)
I look for creative ways to alter difficult situations	802
Does not describe me at all	87 (10.8)
Does not describe me	101 (12.6)
Neutral	278 (34.7)
Describes me	275 (34.3)
Describes me very well	61 (7.6)
Regardless of what happens to me, I believe I can control my reaction to it	802
Does not describe me at all	43 (5.4)
Does not describe me	82 (10.2)
Neutral	248 (30.9)
Describes me	332 (41.4)
Describes me very well	97 (12.1)
I believe I can grow in positive ways by dealing with difficult situations	802
Does not describe me at all	32 (4.0)
Does not describe me	42 (5.2)
Neutral	204 (25.4)
Describes me	395 (49.3)
Describes me very well	129 (16.1)
I actively look for ways to replace the losses I encounter in life	802
Does not describe me at all	63 (7.9)
Does not describe me	64 (8.0)
Neutral	252 (31.4)
Describes me	303 (37.8)
Describes me very well	120 (15.0)
BRCS score (total)	
Mean (\pm SD)	13.72 (3.1)

Brief Resilient Coping Scale (BRCS)	Total
	n (%)
Minimum – maximum	4 to 20
Levels of coping (BRCS categories)	
Low resilient copers (score 4–13)	354 (44.1)
Medium resilient copers (score 14–16)	333 (41.5)
High resilient copers (score 17–20)	115 (14.3)

Table 7
Factors associated with coping with the COVID-19 pandemic in Saudi Arabia

Characteristics	n (row %)			P	AOR	95% CI
	Low resilient (Score 4-13)	Medium to High resilient (Score 14-20)	Total			
Age groups						
18 - 29 years	171 (45.1)	208 (54.9)	379	0.781	1.06	0.71 - 1.58
> 29 years	122 (42.8)	163 (57.2)	285		1	
Sex						
Male	104 (42.8)	139 (57.2)	243		1	
Female	248 (44.6)	308 (55.4)	556	0.641	1.10	0.73 - 1.66
Educational attainment						
Grade 1 – 12	95 (46.6)	109 (53.4)	204		1	
Trade/certificate/diploma	39 (49.4)	40 (50.6)	79	0.643	1.19	0.58 - 2.44
Bachelor or above	217 (42.1)	299 (57.9)	516	0.201	1.33	0.86 - 2.07
Living status						
Live without family members	50 (43.9)	64 (56.1)	114		1	
Live with family members	301 (43.9)	384 (56.1)	685	0.510	0.83	0.47 - 1.46
Nationality						
Non-Saudi	54 (44.3)	68 (55.7)	122	0.271	0.73	0.42 - 1.27
Saudi	353 (44.2)	446 (55.8)	677		1	
Current employment condition						

Characteristics	n (row %)			P	AOR	95% CI
	Low resilient (Score 4-13)	Medium to High resilient (Score 14-20)	Total			
Job unaffected by COVID-19 (employed/Government benefits)	109 (43.8)	140 (56.2)	249		1	
Job affected by COVID-19 (lost job/working hours reduced/	230 (43.5)	299 (56.5)	529	0.790	1.07	0.71 - 1.58
Perceived distress due to change of employment condition						
A little to none	217 (43.8)	279 (56.2)	496		1	
Moderate to a great deal	122 (44.7)	151 (55.3)	273	0.017	0.63	0.43 - 0.92
Frontline or essential service worker (self-identification)						
No	236 (45.0)	288 (55.0)	524		1	
Yes	118 (42.4)	160 (57.6)	278	0.519	1.14	0.76 - 1.71
COVID-19 impacted financial situation						
No impact	190 (47.6)	209 (52.4)	399		1	
Positive impact	51 (38.6)	81 (61.4)	132	0.038	1.68	1.03 - 2.75
Negative impact	113 (41.7)	158 (58.3)	271	0.003	1.82	1.22 - 2.71
Co-morbidities						
No	266 (43.8)	341 (56.2)	607		1	
Psychiatric/Mental health issues	22 (48.9)	23 (51.1)	45	0.363	0.72	0.37 - 1.46
Other co-morbidities	66 (44.0)	84 (56.0)	150	0.571	1.14	0.72 - 1.81

Characteristics	n (row %)			P	AOR	95% CI
	Low resilient (Score 4-13)	Medium to High resilient (Score 14-20)	Total			
Smoking						
Never smoker	293 (45.1)	357 (54.9)	650		1	
Ex-smoker	7 (31.8)	15 (68.2)	22	0.353	1.64	0.58 - 4.66
Current smoker	54 (41.5)	76 (58.5)	130	0.610	1.13	0.71 - 1.79
Contact with known/suspected COVID-19 cases						
No	236 (47.3)	263 (52.7)	499		1	
Yes	110 (38.7)	174 (61.3)	284	0.011	1.63	1.12 - 2.38
COVID-19 related experiences						
No known diagnosis of COVID-19	255 (42.6)	344 (57.4)	599		1	
Tested positive for COVID-19	24 (38.1)	39 (61.9)	63	0.582	1.22	0.60 - 2.48
Tested negative for COVID-19 but self-isolating	48 (51.6)	45 (48.4)	93	0.067	0.59	0.34 - 1.04
Recent overseas travel history and was in quarantine	8 (47.1)	9 (52.9)	17	0.593	0.72	0.22 - 2.38

Discussion

This cross-sectional survey was conducted among people in Saudi Arabia. Aspects of psychological distress, fear of COVID-19, and coping strategies were assessed using K10, FCV-19S and BRCS scales, respectively.

This study indicated a high percentage (70%) of people who suffered from distress during the pandemic, the prevalence of which was more than double compared to other local research in Saudi Arabia. Referring to Alkhamees, Alrashed [29] assessed psychological impact during an early stage of the

pandemic and showed that a quarter of the participants suffered from a moderate to severe psychological impact [20]. Al-Hanawi, Mwale [30] also conducted a study in May 2020 and indicated that 40% of the general public in Saudi Arabia suffered from psychological distress caused by COVID-19 [30]. Thus, as COVID-19 lasted for a prolonged period, more people are expected to have a psychological impact, and more efforts are needed for psychological support. The same observation was noted in Canadian research showing a significant increase in stress during the COVID-19 outbreak [31]. In addition, other factors may play a role in contributing to the increased level of psychological distress in this study as the previous studies were conducted during the initial months of the pandemic. 'Infodemic' could potentially contribute to the heightened distress in this study, which requires further investigations.

In terms of associated factors, age, gender, nationality, perceived distress due to change of employment conditions, the financial impact of COVID-19, and smoking were significantly associated with higher levels of psychological distress. Similar to this study, research conducted in the US during the pandemic showed that women, Hispanics, Asians, families with children under 18, and foreign-born respondents had higher subjective fear and worry levels than their counterparts [32].

Individuals aged 18-29 years had higher psychological distress this result coincides with A report from over 60 countries found that Younger age groups were more vulnerable to the mental health impact of the pandemic [10]. The explanations of the result which could be a result of dependence on inauthentic information received from social media platforms. Marar, Al-Madaney [33] reported that most of the Saudi population used social media platforms when they needed health information. Another study showed that social media had a positive impact on the knowledge of the Saudi population towards COVID-19 [34]. However, it was found that younger individuals were less likely to practice coping methods such as spirituality and mindfulness, which has proved to be a handy tool to control stress and depression [35].

In this study, smoking was associated with increased psychological distress. According to previous evidence, smoking could cause symptoms such as depression and anxiety [36]. In a study from England, there was a significant association between psychological distress and past smoking [37]. The study showed further deterioration in mental health among smokers during the COVID-19 pandemic. A systematic review also showed a bi-directional effect between psychological distress and smoking [36]. Significantly, one research indicated that 25% reported increasing smoking more than usual, though 51% reported smoking the same amount during COVID-19 pandemic [38]. It is important to note that a recent study from Saudi Arabia showed a prevalence of cigarette smoking of 21.4% in the population [39]. Thus, it is essential to further investigate to alleviate the risk of smoking and mental health in the population especially during the pandemic.

Additionally, changes in employment conditions and financial challenges were related to high level of fear from COVID-19 and psychological distress. The economic effect of COVID-19 was well described worldwide [40]. In particular, research undertaken in Italy, India, South Africa, the UK and the USA

identified that, cigarette smokers bought more cigarettes than usual triggered by the fear that stores might run out of stock or be closed because of lock down during the pandemic [11].

In terms of coping strategies, more than half of the study participants had medium to high resilient coping. The relationship between coping strategies and stress was assessed previously [41, 42] According to previous literature; Saudis are reasonably resilient to COVID-19 stress compared to other countries experiencing this pandemic with high quality of life scores [43]. Unlike other countries suffering from food insecurity and free treatment, unavailable beds at intensive care units, and insufficient doctors, the Saudi government made extraordinary efforts in economics, health, religion, social support, food, and quality of life [3].

Individuals in this research, who came in contact with confirmed or suspected COVID-19 cases were more likely to have medium to high resilient coping, which could be due to accessing free treatment and an advanced healthcare system in Saudi. In addition, there is a clear relationship between coping strategy and stress outcome [44]. In one study, religion was one of the most frequent coping strategies among nursing students in Saudi Arabia [45]. The Ministry of Health in Saudi Arabia developed multiple methods to support the wellbeing and mental health of frontline and health care providers. This included mobile applications, hotlines and virtual meeting available for addressing concerns and worries of healthcare providers [46]. It is also important to note that different health care professionals and age groups may use different coping strategies. In one study, nurses used avoiding coping style and positive reappraisal than doctors and those > 40 years of age used social support and those <40 years relied on avoidance of stress management techniques [46]. The global cross-sectional studies that assessed associated factors with psychological distress, levels of fear, and coping strategies among community members, frontline workers, and patients across 17 countries found physicians had higher psychological distress, but low levels of fear of COVID-19; nurses had medium to high resilient coping [24]. Despite positive coping strategies in the health and medical field, there were limited coping strategies for other essential service workers, and general community members who suffered from COVID-19. Future studies should focus on intervention measuring and programs among the general population in Saudi to identify coping strategies.

This study had a large and representative sample from different categories of frontline workers and the general population and was conducted during the second wave of the pandemic. Findings will assist in having a clear vision for decision-makers to manage psychological distress and fear of COVID-19 with adaptable strategies for Saudi people. However, there are several limitations to this study. The use of an online self-administered questionnaire may have introduced response and recall bias. Additionally, the dissemination of questionnaires through social media platforms for recruitment resulted in having more participants from certain regions than others.

Conclusion

Identification of high-risk groups with increased psychological distress and fear during the current COVID-19 pandemic was critical. Factors identified in this study would strengthen illness prevention by guiding policymakers for such a vulnerable population. Healthcare authorities should monitor young people and smokers about their mental health, and considering a behavioural support program will be invaluable. Those affected by changes in employment and negative financial impacts, should be prioritised within the current support services available in Saudi Arabia. Living in a COVID-safe environment and adopting a lifestyle supporting both physical and mental well-being during the pandemic era is warranted in Saudi Arabia.

Abbreviations

AOR
Adjusted Odds Ratio
BRCS
Brief Resilient Coping Scale
CIs
Confidence Interval
FCV-19S
Fear of COVID-19 Scale
Kessler Psychological Distress Scale
K-10
ORs
Odds Ratios
PCR
Polymerase Chain Reaction.

Declarations

Ethics approval and consent to participate

Ethical approval was obtained from the Human Research Ethics Committee in King Fahad Medical City, Saudi Arabia (H-01-R-012). Each study participant read the informed consent form along with a plain-language summary and ticked their consent in the online form prior to accessing the study questionnaire. All methods were performed in accordance with the relevant guidelines and regulations of the Declaration of Helsinki.

Consent for publication

Data were collected anonymously; therefore, no identifying information was collected from the study participants.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Conflict of Interest

The authors have declared no conflict of interest.

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Authors' contributions

TAA and MAR conceived the conception and design of the study. TAA, AA, IM, RJA, SA, AEM, AA, LNM, AAA, MB, SG and LIA conducted data collection. TAA, IM, MAR and SMSI contributed to the data analysis. TAA, AA, IM, RJA and JAA prepared the first draft of the manuscript. SMA, FS, MS, BB, WC and MAR critically reviewed the manuscript. All authors approved the final version of the article.

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