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Research paper

Psychological impact of COVID-19 pandemic in the Philippines

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ABSTRACT

Background: The 2019 coronavirus disease (COVID-19) pandemic poses a threat to societies' mental health. This study examined the prevalence of psychiatric symptoms and identified the factors contributing to psychological impact in the Philippines.

Methods: A total of 1879 completed online surveys were gathered from March 28-April 12, 2020. Collected data included socio-demographics, health status, contact history, COVID-19 knowledge and concerns, precautionary measures, information needs, the Depression, Anxiety and Stress Scales (DASS-21) and the Impact of Events Scale-Revised (IES-R) ratings.

Results: The IES-R mean score was 19.57 (SD = 13.12) while the DASS-21 mean score was 25.94 (SD = 20.59). In total, 16.3% of respondents rated the psychological impact of the outbreak as moderate-to-severe; 16.9% reported moderate-to-severe depressive symptoms; 28.8% had moderate-to-severe anxiety levels; and 13.4% had moderate-to-severe stress levels.

Female gender; youth age; single status; students; specific symptoms; recent imposed quarantine; prolonged home-stay; and reports of poor health status, unnecessary worry, concerns for family members, and discrimination were significantly associated with greater psychological impact of the pandemic and higher levels of stress, anxiety and depression ($p < 0.05$).

Adequate health information, having grown-up children, perception of good health status and confidence in doctors' abilities were significantly associated with lesser psychological impact of the pandemic and lower levels of stress, anxiety and depression ($p < 0.05$).

Limitations: An English online survey was used.

Conclusion: During the early phase of the pandemic in the Philippines, one-fourth of respondents reported moderate-to-severe anxiety and one-sixth reported moderate-to-severe depression and psychological impact. The factors identified can be used to devise effective psychological support strategies.

1. Introduction

The 2019 coronavirus disease (COVID-19) was declared a pandemic by the World Health Organization on March 11, 2020. It may follow the influenza pandemic of 1918 in magnitude which affected about one-third of the world population and killed 50 million. To date, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the virus that causes COVID-19 disease, has affected 213 countries and territories around the world with 14 million cases and half a million deaths (WHO, 2020). Control efforts worldwide led to travel bans and restrictions. In the Philippines, President Rodrigo Duterte placed the entire Luzon archipelago on enhanced community quarantine on March 16, 2020 (Official Gazette, 2020). Curfew, check-points and travel restrictions were implemented (PCOO, 2020; Yap and Jiao, 2020). Business and school activities were suspended indefinitely. People were forced to stay in their homes.

Previous disease outbreaks caused generalized fear to the public and induced fear-related behaviors and anxiety (Shultz et al., 2016;

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Person et al., 2004). With the novel coronavirus plaguing the world, there are so many uncertainties with the disease with a possibility of a fatal outcome. There were reported manifestations of distress, anxiety, depression, and insomnia in general populations (Wang et al., 2020a; Wang et al., 2020b; Rajkumar, 2020b). The systematic review and meta-analysis done by Salari et al. (2020) among the general populations in Asia and Europe showed that the prevalence of stress was 29.6% (95% confidence interval, 24.3-35.4), anxiety was 31.9% (95% CI, 27.5-36.7) and depression was 33.7% (95% CI, 27.5-40.6).

Infection or death of family and friends could worsen the overall mental health well-being of an individual (Ahmed et al., 2020). Patients with confirmed or suspected COVID-19 may experience fear, while those in quarantine might experience boredom, loneliness, and anger (Xiang et al., 2020). Overwhelming deep emotional traumas and socio-economic stressors brought about by the pandemic and the lockdowns have even led the more vulnerable people to commit suicide (Mamun & Griffiths, 2020; Mamun & Ullah, 2020; Miller, 2020; Rajkumar, 2020a).

It is imperative to determine the prevalence of adverse mental health issues in a society during this pandemic and mitigate its psychological risks and consequences. To date, there are no studies that examine the psychological impact of the COVID-19 pandemic to the general population in the Philippines. Therefore, this study aims to establish the prevalence of psychiatric symptoms and identify risk and protective factors contributing to psychological stress among social media users in the Philippines during the COVID-19 pandemic.

2. Method

2.1. Participants and procedures

From 28 March to 12 April 2020, when the entire Luzon Islands of the Philippines was under enhanced community quarantine, an online survey in English language was disseminated through the social media using snowball sampling technique. The survey included information on socio-demographics, personal symptoms, contact history, knowledge and concerns about COVID-19, precautionary measures about COVID-19, information update on COVID-19, the validated Depression, Anxiety and Stress Scales (DASS-21) and the Impact of Events Scale-Revised (IES-R) instrument (Cheung et al., 2019; Lovibond and Lovibond, 1995; Creamer et al, 2003).

2.2. Ethics

This study was approved by the Research Ethics Board of the University of the Philippines Manila (UPMREB 2020-198-01).

2.3. Statistical analysis

Data analysis was performed using the SPSS Statistic 24.0 (IBM SPSS, New York, NY, USA). Frequency and percentage were applied to describe variables. The scores of IES-R and DASS-21 subscales were expressed as mean and standard deviation (SD). Association analysis using chi-square test was performed. P value < 0.05 was considered statistically significant.

3. Results

There were 2037 completed surveys out of 2700 total respondents with a completion rate of 75.4%. Excluding 158 respondents who have a pre-existing neuropsychiatric condition, a total of 1879 responses were analyzed. Table 1 shows the demographic characteristics of the participants. The majority were females (69%), well-educated (68.5%, at least a bachelor's degree), residents of the Philippines (96.6%), single (63.7%), employed (61.4%), non-health care professionals (67.6%), with no children (65.8%) and members of household size of 3-5 people (54.4%). The mean age of respondents was 34.5 years (SD, 13.4 years).

3.1. Mental health status of respondents

Respondents' depression, anxiety and stress levels, measured using DASS-21 scale, revealed a sample mean score of 25.94 (SD = 20.59). For the depression subscale, 1338 (71.2%) were considered to have a normal score (score: 0-9); 224 (11.9%) reported mild depressive symptoms (score: 10-12); 239 (12.7%) moderate depressive symptoms (scores 13-20); and 78 (4.2%) reported severe to extremely severe depressive symptoms (score: 21-42). For the anxiety subscale, 1157 (61.6%) reported normal scores (score: 0-6); 181 (9.6%) reported mild anxiety symptoms (score: 7-9); 333 (17.7%) reported moderate anxiety symptoms (score: 10-14); and 208 (11.1%) reported severe to extremely severe anxiety symptoms (scores 15-42). For the stress subscale, 1131 (60.2%) reported normal scores (score <10); 496 (26.4%) reported mild stress signals (scores 11-18); 179 (9.5%) reported moderate stress signals (scores 19-26); and 73 (3.9%) reported severe to extremely severe stress signals (scores 27-42).

The psychological impact of COVID-19 outbreak, measured using the IES-R scale, revealed a sample mean score of 19.57 (SD, 13.12). Of all respondents, 1277 (68%) reported minimal psychological impact (score: 0-23); 296 (15.8%) rated mild psychological impact (score: 24-32); and 306 (16.3%) reported a moderate to severe psychological impact (score: >33).

3.2. Sociodemographic factors and association with psychological impact

Table 1 shows that male respondents had significantly lower scores for stress ($p=0.018$), anxiety ($p=0.038$) and IES-R ($p=0.015$) compared to females. The young age group of 12-21.4 years, single people and those who had no children had significantly high stress, anxiety, depression and IES-R scores. The non-health care professionals (non-HCP) had significantly higher levels of stress ($p=0.034$) and depression signals ($p=0.028$) and higher IES-R score ($p=0.001$) than health care professionals (HCP). Student status was associated with high anxiety subscale scores ($p<0.001$). Respondents who had higher level of education (Masters/Doctorate) and had (a) child/ren older than 16 years old had significantly lower DASS stress subscale, DASS anxiety subscale, DASS depression subscale and IES-R scores ($p<0.05$). The socio-demographic variables household size and residential country during the outbreak were not associated with IES-R and DASS subscale scores.

3.3. Physical health status and association with psychological impact

Table 2 tabulates the self-reported physical health status of the respondents. Only 1% of the sample had fever of at least 1 day within the 2 weeks prior to the survey and 0.4% had fever in combination with either cough or breathing difficulty. Other respondents reported chills (2.1%), headache (22.6%), body pain (11.1%), cough (14.4%), breathing difficulty (6.7%), dizziness (5.5%), sore throat (12.6%) and nausea, vomiting or diarrhea (3.1%). These symptoms were significantly associated with higher scores for IESR, DASS stress subscale, DASS anxiety subscale and DASS depression subscale. The presence of runny nose in 12.4% of participants is associated with higher score for DASS stress ($p<0.001$), anxiety ($p<0.001$) and depression ($p=0.002$) subscales. About 51.4% of respondents reported no symptom for the past 2 weeks.

Overall, 5% of respondents consulted with a doctor in the clinic in the past 14 days; 0.3% were hospitalized; 0.5% were tested for COVID-19; and 2% had recent quarantine by health authority. Majority of the respondents rated their current health status as good; 20.1% reported suffering from a chronic illness and 57.6% had medical insurance coverage.

Recent consultation with doctors in clinics, recent placement in quarantine by a health authority and poor to very poor current health status were associated with high scores in IES-R, DASS stress subscale, DASS anxiety subscale and DASS depression subscale. Having medical

Table 1
Demographic variables and association with psychological impact ($n = 1879$).

Variable	*n* (%)	Stress			Anxiety			Depression			Impact of Event		
		Normal and Mild *n* (%)	At least Moderate *n* (%)	*p*-value*	Normal and Mild*n* (%)	At least Moderate*n* (%)	*p*-value*	Normal and Mild*n* (%)	At least Moderate*n* (%)	*p*-value*	Normal and Mild *n* (%)	At least Moderate*n* (%)	*p*-value*
Gender				0.018			0.038			0.13			0.015
Female	1296 (69)	1106 (85.3)	190 (14.7)		904 (69.8)	392 (30.2)		1066 (82.3)	230 (17.7)		1067 (82.3)	229 (17.7)	
Male	583 (31)	521 (89.4)	62 (10.6)		434 (74.4)	149 (25.6)		496 (85.1)	87 (14.9)		506 (86.8)	77 (13.2)	
Age (years)				<0.001			<0.001			. <0.001			<0.001
12-21.4	430 (22.9)	345 (80.2)	85 (19.8)		269 (62.6)	161 (37.4)		317 (73.7)	113 (26.3)		332 (77.2)	98 (22.8)	
21.4-30.8	426 (22.7)	350 (82.2)	76 (17.8)		285 (66.9)	141 (33.1)		344 (80.8)	82 (19.2)		340 (79.8)	86 (20.2)	
30.8-40.2	425 (22.6)	366 (86.1)	59 (13.9)		297 (69.9)	128 (30.1)		353 (83.1)	72 (16.9)		353 (83.1)	72 (16.9)	
40.2-49.6	303 (16.1)	285 (94.1)	18 (5.9)		238 (78.5)	65 (21.5)		271 (89.4)	32 (10.6)		275 (90.8)	28 (9.2)	
>49.6	295 (15.7)	281 (95.3)	14 (4.7)		249 (84.4)	46 (15.6)		277 (93.9)	18 (6.1)		273 (92.5)	22 (7.5)	
Educational attainment				0.034			0.001			<0.001			<0.001
High school and lower	133 (7.1)	111 (83.5)	22 (16.5)		89 (66.9)	44 (33.1)		106 (79.7)	27 (20.3)		104 (78.2)	29 (21.8)	
College	458 (24.4)	384 (83.8)	74 (16.2)		300 (65.5)	158 (34.5)		357 (77.9)	101 (22.1)		358 (78.2)	100 (21.8)	
University: Bachelor	677 (36)	585 (86.4)	92 (13.6)		480 (70.9)	197 (29.1)		557 (82.3)	120 (17.7)		567 (83.8)	110 (16.2)	
University: Masters or Doctorate	611 (32.5)	547 (89.5)	64 (10.5)		469 (76.8)	142 (23.2)		542 (88.7)	69 (11.3)		544 (89)	67 (11)	
Residential country during the COVID-19 outbreak				0.357			0.807			0.83			0.433
Philippines	1816 (96.6)	1570 (86.5)	246 (13.5)		1294 (71.3)	522 (28.7)		1509 (83.1)	307 (16.9)		1518 (83.6)	298 (16.4)	
Other	63 (3.4)	57 (90.5)	6 (9.5)		44 (69.8)	19 (30.2)		53 (84.1)	10 (15.9)		55 (87.3)	8 (12.7)	
Marital status				<0.001			<0.001			<0.001			<0.001
Single	1196 (63.7)	996 (83.3)	200 (16.7)		800 (66.9)	396 (33.1)		953 (79.7)	243 (20.3)		964 (80.6)	232 (19.4)	
Married	619 (32.9)	570 (92.1)	49 (7.9)		485 (78.4)	134 (21.6)		551 (89)	68 (11)		554 (89.5)	65 (10.5)	
Divorced/separated	44 (2.3)	43 (97.7)	1 (2.3)		35 (79.5)	9 (20.5)		39 (88.6)	5 (11.4)		39 (88.6)	5 (11.4)	
Widowed	20 (1.1)	18 (90)	2 (10)		18 (90)	2 (10)		19 (95)	1 (5)		16 (80)	4 (20)	
Employment status				<0.001			<0.001			<0.001			<0.001
Student	548 (29.2)	442 (80.7)	106 (19.3)		353 (64.4)	195 (35.6)		419 (76.5)	129 (23.5)		421 (76.8)	127 (23.2)	
Employed	1153 (61.4)	1023 (88.7)	130 (11.3)		841 (72.9)	312 (27.1)		978 (84.8)	175 (15.2)		992 (86)	161 (14)	
Unemployed	69 (3.7)	61 (88.4)	8 (11.6)		55 (79.7)	14 (20.3)		64 (92.8)	5 (7.2)		63 (91.3)	6 (8.7)	
Housewife	53 (2.8)	49 (92.5)	4 (7.5)		41 (77.4)	12 (22.6)		49 (92.5)	4 (7.5)		46 (86.8)	7 (13.2)	
Farmers	4 (0.2)	3 (75)	1 (25)		3 (75)	1 (25)		3 (75)	1 (25)		3 (75)	1 (25)	
Retired	52 (2.8)	49 (94.2)	3 (5.8)		45 (86.5)	7 (13.5)		49 (94.2)	3 (5.8)		48 (92.3)	4 (7.7)	
Health care professional				0.034			0.146			0.028			0. 001
Yes	609 (32.4)	542 (89)	67 (11)		447 (73.4)	162 (26.6)		523 (85.9)	86 (14.1)		535 (87.8)	74 (12.2)	
No	1270 (67.6)	1085 (85.4)	185 (14.6)		891 (70.2)	379 (29.8)		1039 (81.8)	231 (18.2)		1038 (81.7)	232 (18.3)	
Parental status				<0.001			<0.001			<0.001			0. 001
Not applicable	860 (45.8)	721 (83.8)	139 (16.2)		575 (66.9)	285 (33.1)		681 (79.2)	179 (20.8)		693 (80.6)	167 (19.4)	
No children	376 (20)	314 (83.5)	62 (16.5)		261 (69.4)	115 (30.6)		309 (82.2)	67 (17.8)		310 (82.4)	66 (17.6)	
Has child younger than 16 years	311 (16.6)	277 (89.1)	34 (10.9)		232 (74.6)	79 (25.4)		272 (87.5)	39 (12.5)		270 (86.8)	41 (13.2)	
Has child older than 16 years	186 (9.9)	177 (95.2)	9 (4.8)		155 (83.3)	31 (16.7)		172 (92.5)	14 (7.5)		166 (89.2)	20 (10.8)	
Has children older than 16 years and younger than 16 years	146 (7.8)	138 (94.5)	8 (5.5)		115 (78.8)	31 (21.2)		128 (87.7)	18 (12.3)		134 (91.8)	12 (8.2)	
Household size				0.551			0.508			0.451			0.417
1 person	107 (5.7)	90 (84.1)	17 (15.9)		70 (65.4)	37 (34.6)		84 (78.5)	23 (21.5)		87 (81.3)	20 (18.7)	
2 persons	173 (9.2)	149 (86.1)	24 (13.9)		120 (69.4)	53 (30.6)		140 (80.9)	33 (19.1)		138 (79.8)	35 (20.2)	
3-5 persons	1022 (54.4)	895 (87.6)	127 (12.4)		735 (71.9)	287 (28.1)		857 (83.9)	165 (16.1)		862 (84.3)	160 (15.7)	
6 persons or more	577 (30.7)	493 (85.4)	84 (14.6)		413 (71.6)	164 (28.4)		481 (83.4)	96 (16.6)		486 (84.2)	91 (15.8)	

* The Chi-square statistic is significant at $p < 0.05$ level.

Table 2
Physical health status and association with psychological impact ($n = 1879$).

Variable	n (%)	Stress			Anxiety			Depression			Impact of event		
		Normal and Mild n (%)	At least Moderate n (%)	p-value*	Normal and Mild n (%)	At least Moderate n (%)	p-value*	Normal and Mild n (%)	At least Moderate n (%)	p-value*	Normal and Mild n (%)	At least Moderate n (%)	p-value*
Persistent fever (>38°C for at least 1 day)				0.684			0.669			0.542			0.493
No	1861 (99)	1612 (86.6)	249 (13.4)		1326 (71.3)	535 (28.7)		1548 (83.2)	313 (16.8)		1559 (83.8)	302 (16.2)	
Yes	18 (1)	15 (83.3)	3 (16.7)		12 (66.7)	6 (33.3)		14 (77.8)	4 (22.2)		14 (77.8)	4 (22.2)	
Chills				0.006			<0.001			<0.001			<0.001
No	1840 (97.9)	1599 (86.9)	241 (13.1)		1323 (71.9)	517 (28.1)		1540 (83.7)	300 (16.3)		1550 (84.2)	290 (15.8)	
Yes	39 (2.1)	28 (71.8)	11 (28.2)		15 (38.5)	24 (61.5)		22 (56.4)	17 (43.6)		23 (59)	16 (41)	
Headache				<0.001			<0.001			<0.001			<0.001
No	1454 (77.4)	1305 (89.8)	149 (10.2)		1097 (75.4)	357 (24.6)		1267 (87.1)	187 (12.9)		1260 (86.7)	194 (13.3)	
Yes	425 (22.6)	322 (75.8)	103 (24.2)		241 (56.7)	184 (43.3)		295 (69.4)	130 (30.6)		313 (73.6)	112 (26.4)	
Body pain				<0.001			<0.001			<0.001			<0.001
No	1671 (88.9)	1476 (88.3)	195 (11.7)		1244 (74.4)	427 (25.6)		1426 (85.3)	245 (14.7)		1433 (85.8)	238 (14.2)	
Yes	208 (11.1)	151 (72.6)	57 (27.4)		94 (45.2)	114 (54.8)		136 (65.4)	72 (34.6)		140 (67.3)	68 (32.7)	
Cough				<0.001			<0.001			<0.001			<0.001
No	1609 (85.6)	1412 (87.8)	197 (12.2)		1186 (73.7)	423 (26.3)		1361 (84.6)	248 (15.4)		1366 (84.9)	243 (15.1)	
Yes	270 (14.4)	215 (79.6)	55 (20.4)		152 (56.3)	118 (43.7)		201 (74.4)	69 (25.6)		207 (76.7)	63 (23.3)	
Breathing difficulty				<0.001			<0.001			<0.001			<0.001
No	1754 (93.3)	1538 (87.7)	216 (12.3)		1302 (74.2)	452 (25.8)		1505 (85.8)	249 (14.2)		1492 (85.1)	262 (14.9)	
Yes	125 (6.7)	89 (71.2)	36 (28.8)		36 (28.8)	89 (71.2)		57 (45.6)	68 (54.4)		81 (64.8)	44 (35.2)	
Dizziness				<0.001			<0.001			<0.001			<0.001
No	1775 (94.5)	1563 (88.1)	212 (11.9)		1296 (73)	479 (27)		1503 (84.7)	272 (15.3)		1508 (85)	267 (15)	
Yes	104 (5.5)	64 (61.5)	40 (38.5)		42 (40.4)	62 (59.6)		59 (56.7)	45 (43.3)		65 (62.5)	39 (37.5)	
Runny nose				<0.001			<0.001			.002			0.057
No	1646 (87.6)	1437 (87.3)	209 (12.7)		1199 (72.8)	447 (27.2)		1385 (84.1)	261 (15.9)		1388 (84.3)	258 (15.7)	
Yes	233 (12.4)	190 (81.5)	43 (18.5)		139 (59.7)	94 (40.3)		177 (76)	56 (24)		185 (79.4)	48 (20.6)	
Sore throat				<0.001			<0.001			<0.001			0.020
No	1642 (87.4)	1445 (88)	197 (12)		1202 (73.2)	440 (26.8)		1389 (84.6)	253 (15.4)		1387 (84.5)	255 (15.5)	
Yes	237 (12.6)	182 (76.8)	55 (23.2)		136 (57.4)	101 (42.6)		173 (73)	64 (27)		186 (78.5)	51 (21.5)	
Persistent fever and cough or breathing difficulty				0.238			0.097			0.408			0.056
No	1872 (99.6)	1622 (86.6)	250 (13.4)		1335 (71.3)	537 (28.7)		1557 (83.2)	315 (16.8)		1569 (83.8)	303 (16.2)	
Yes	7 (0.4)	5 (71.4)	2 (28.6)		3 (42.9)	4 (57.1)		5 (71.4)	2 (28.6)		4 (57.1)	3 (42.9)	
Nausea, vomiting, diarrhea				<0.001			<0.001			<0.001			<0.001
No	1821 (96.9)	1591 (87.4)	230 (12.6)		1315 (72.2)	506 (27.8)		1531 (84.1)	290 (15.9)		1538 (84.5)	283 (15.5)	
Yes	58 (3.1)	36 (62.1)	22 (37.9)		23 (39.7)	35 (60.3)		31 (53.4)	27 (46.6)		35 (60.3)	23 (39.7)	
Consultation with a doctor in the clinic in the past 14 days				0.047			0.005			0.021			0.027
No	1785 (95)	1552 (86.9)	233 (13.1)		1283 (71.9)	502 (28.1)		1492 (83.6)	293 (16.4)		1502 (84.1)	283 (15.9)	
Yes	94 (5)	75 (79.8)	19 (20.2)		55 (58.5)	39 (41.5)		70 (74.5)	24 (25.5)		71 (75.5)	23 (24.5)	
Recent hospitalization in the past 14 days				0.815			0.250			0.281			0.279
No	1873 (99.7)	1622 (86.6)	251 (13.4)		1335 (71.3)	538 (28.7)		1558 (83.2)	315 (16.8)		1567 (83.7)	306 (16.3)	
Yes	6 (0.3)	5 (83.3)	1 (16.7)		3 (50)	3 (50)		4 (66.7)	2 (33.3)		6 (100)	0 (0)	
Recent testing for COVID-19 in the past 14 days				0.437			0.763			0.667			0.185
No	1870 (99.5)	1620 (86.6)	250 (13.4)		1332 (71.2)	538 (28.8)		1555 (83.2)	315 (16.8)		1564 (83.6)	306 (16.4)	
Yes	9 (0.5)	7 (77.8)	2 (22.2)		6 (66.7)	3 (33.3)		7 (77.8)	2 (22.2)		9 (100)	0 (0)	
Recent quarantine by health authority in the past 14 days				0.049			0.002			0.011			0.025
No	1842 (98)	1599 (86.8)	243 (13.2)		1320 (71.7)	522 (28.3)		1537 (83.4)	305 (16.6)		1547 (84)	295 (16)	
Yes	37 (2)	28 (75.7)	9 (24.3)		18 (48.6)	19 (51.4)		25 (67.6)	12 (32.4)		26 (70.3)	11 (29.7)	

(*continued on next page*)

Table 2 (*continued*)

Variable	*n* (%)	Stress		*p*-value*	Anxiety		*p*-value*	Depression		*p*-value*	Impact of event		*p*-value*
		Normal and Mild *n* (%)	At least Moderate *n* (%)		Normal and Mild *n* (%)	At least Moderate *n* (%)		Normal and Mild *n* (%)	At least Moderate *n* (%)		Normal and Mild *n* (%)	At least Moderate *n* (%)	
Self-rating of current health status				< 0.001			< 0.001			< 0.001			< 0.001
Very good	626 (33.3)	598 (95.5)	28 (4.5)		526 (84)	100 (16)		581 (92.8)	45 (7.2)		581 (92.8)	45 (7.2)	
Good	958 (51)	831 (86.7)	127 (13.3)		672 (70.1)	286 (29.9)		793 (82.8)	165 (17.2)		797 (83.2)	161 (16.8)	
Fair	282 (15)	196 (69.5)	86 (30.5)		137 (48.6)	145 (51.4)		185 (65.6)	97 (34.4)		191 (67.7)	91 (32.3)	
Poor	11 (0.6)	2 (18.2)	9 (81.8)		3 (27.3)	8 (72.7)		3 (27.3)	8 (72.7)		4 (36.4)	7 (63.6)	
Very poor	2 (0.1)	0 (0)	2 (100)		0 (0)	2 (100)		0 (0)	2 (100)		0 (0)	2 (100)	
Medical insurance coverage				0.67			0.008			0.287			0.157
No	797 (42.4)	687 (86.2)	110 (13.8)		542 (68)	255 (32)		654 (82.1)	143 (17.9)		656 (82.3)	141 (17.7)	
Yes	1082 (57.6)	940 (86.9)	142 (13.1)		796 (73.6)	286 (26.4)		908 (83.9)	174 (16.1)		917 (84.8)	165 (15.2)	
Presence of chronic illness				0.808			0.755			0.579			0.596
No	1502 (79.9)	1302 (86.7)	200 (13.3)		1072 (71.4)	430 (28.6)		1245 (82.9)	257 (17.1)		1254 (83.5)	248 (16.5)	
Yes	377 (20.1)	325 (86.2)	52 (13.8)		266 (70.6)	111 (29.4)		317 (84.1)	60 (15.9)		319 (84.6)	58 (15.4)	

* The Chi-square statistic is significant at $p < 0.05$ level.

insurance coverage was associated with a lower DASS anxiety subscale score ($p = 0.008$).

3.4. Travel and contact history and association with psychological impact

In the two weeks prior to the survey, only 31 respondents (1.6%) had international travel history (Table 3). There were 201 (10.7%) respondents who had direct or indirect contact with patients suffering from COVID-19; 56 (3%) had close contact with a confirmed case of COVID-19; 104 (5.5%) had indirect contact with a confirmed case; 88 (4.7%) had contact with a suspected case; and 29 (1.5%) had contact with infected materials. Among these variables, direct contact with a confirmed case of COVID-19 was associated with higher depression subscale score ($p = 0.044$).

3.5. Knowledge and concerns about COVID-19 and association with psychological impact

The proportions of respondents who perceive that the routes of transmission of the virus for COVID-19 were via droplets, via contaminated objects and airborne were 98.6%, 96.7% and 35.3%, respectively (Table 4). About 76.8% were satisfied to very satisfied with the amount of health information available. Almost all knew about current numbers of cases, deaths and recoveries from COVID-19. Information was mainly sourced from social media and internet by 77.9% of the respondents with an average of 0-9 hours screen time. Three-fourths of respondents had confidence in their own doctors' ability to recognize COVID-19. About 40.3% felt they will likely contract COVID-19 during the outbreak. There were 85% of respondents who felt they will likely survive if infected with COVID-19. On concerns about other family members getting COVID-19, 60.7% were very worried and 33.3% somewhat worried. Half of the respondents were somewhat to very worried about a child younger than 16 years old getting the illness.

Very high satisfaction on the amount of health information available about COVID-19 was associated with low scores in IES-R, DASS stress subscale, DASS anxiety subscale and DASS depression subscale ($p < 0.001$). Dissatisfaction with available health information was associated with high anxiety level ($p < 0.001$). Those who have not heard about the number of recovered cases had significant high scores on DASS stress subscale ($p = 0.003$), DASS anxiety subscale ($p = 0.005$) and IES-R ($p = 0.002$).

The proportion of those who primarily obtain their information through the social media and internet had high levels of anxiety ($p < 0.001$) and depression signals ($p < 0.001$). Those who had their family members as the main source of health information had high stress signals ($p = 0.045$).

High level of confidence in their own doctors' ability to diagnose COVID-19 was associated with low scores in DASS stress subscale ($p = 0.017$), DASS anxiety subscale ($p = 0.001$), DASS depression subscale ($p = 0.006$) and IES-R ($p = 0.006$) scores.

Those who reported not likely contracting COVID-19 during the outbreak are either normal or have mild symptoms of stress ($p = 0.017$), anxiety ($p = 0.001$), and depression ($p = 0.035$). The respondents who felt unlikely to survive a COVID-19 infection and who felt worried about family members getting COVID-19 had high scores on stress, anxiety and depression subscales and IES-R. Those who felt very worried about a child younger than 16 years old getting COVID-19 had a significantly high score for DASS anxiety subscale ($p = 0.005$).

Majority did not feel being discriminated against by other countries due to the outbreak. However, to those who felt discriminated against, they had significantly high scores for stress ($p = 0.001$), anxiety ($p < 0.001$), depression ($p = 0.004$) and IES-R ($p < 0.001$).

Table 3
Travel and contact history and association with psychological impact ($n = 1879$).

Variable	*n* (%)	Stress			Anxiety			Depression			Impact of event		
		Normal and Mild *n* (%)	At least Moderate *n* (%)	*p*-value*	Normal and Mild *n* (%)	At least Moderate *n* (%)	*p*-value*	Normal and Mild *n* (%)	At least Moderate *n* (%)	*p*-value*	Normal and Mild *n* (%)	At least Moderate *n* (%)	*p*-value*
Travel outside residential country in the past 14 days				0.131			0.667			0.911			0.148
Yes	31 (1.6)	24 (77.4)	7 (22.6)		21 (67.7)	10 (32.3)		26 (83.9)	5 (16.1)		23 (74.2)	8 (25.8)	
No	1848 (98.4)	1603 (86.7)	245 (13.3)		1317 (71.3)	531 (28.7)		1536 (83.1)	312 (16.9)		1550 (83.9)	298 (16.1)	
Direct or indirect contact with patients suffering from COVID-19				0.517			0.132			0.31			0.246
No	1678 (89.3)	1450 (86.4)	228 (13.6)		1204 (71.8)	474 (28.2)		1400 (83.4)	278 (16.6)		1399 (83.4)	279 (16.6)	
Yes	201 (10.7)	177 (88.1)	24 (11.9)		134 (66.7)	67 (33.3)		162 (80.6)	39 (19.4)		174 (86.6)	27 (13.4)	
Close contact with a confirmed case				0.553			0.574			0.044			0.956
No	1823 (97)	1580 (86.7)	243 (13.3)		1300 (71.3)	523 (28.7)		1521 (83.4)	302 (16.6)		1526 (83.7)	297 (16.3)	
Yes	56 (3)	47 (83.9)	9 (16.1)		38 (67.9)	18 (32.1)		41 (73.2)	15 (26.8)		47 (83.9)	9 (16.1)	
Indirect contact with a confirmed case				0.779			0.366			0.695			0.422
No	1775 (94.5)	1536 (86.5)	239 (13.5)		1268 (71.4)	507 (28.6)		1477 (83.2)	298 (16.8)		1483 (83.5)	292 (16.5)	
Yes	104 (5.5)	91 (87.5)	13 (12.5)		70 (67.3)	34 (32.7)		85 (81.7)	19 (18.3)		90 (86.5)	14 (13.5)	
Contact with a suspected case				0.797			0.172			0.737			0.922
No	1791 (95.3)	1550 (86.5)	241 (13.5)		1281 (71.5)	510 (28.5)		1490 (83.2)	301 (16.8)		1499 (83.7)	292 (16.3)	
Yes	88 (4.7)	77 (87.5)	11 (12.5)		57 (64.8)	31 (35.2)		72 (81.8)	16 (18.2)		74 (84.1)	14 (15.9)	
Contact with infected materials				0.246			0.273			0.120			0.888
No	1850 (98.5)	1604 (86.7)	246 (13.3)		1320 (71.4)	530 (28.6)		1541 (83.3)	309 (16.7)		1549 (83.7)	301 (16.3)	
Yes	29 (1.5)	23 (79.3)	6 (20.7)		18 (62.1)	11 (37.9)		21 (72.4)	8 (27.6)		24 (82.8)	5 (17.2)	

* The Chi-square statistic is significant at $p < 0.05$ level.

Table 4
Knowledge and concerns about COVID-19 and association with psychological impact ($n = 1879$).

Variable	*n* (%)	Stress			Anxiety			Depression			Impact of event		
		Normal and Mild *n* (%)	At least Moderate *n* (%)	*p*-value*	Normal and Mild *n* (%)	At least Moderate *n* (%)	*p*-value*	Normal and Mild *n* (%)	At least Moderate *n* (%)	*p*-value*	Normal and Mild *n* (%)	At least Moderate *n* (%)	*p*-value*
Knowledge of COVID-19 Route of Transmission													
Droplets				0.372			0.567			0.948			0.150
Agree	1852 (98.6)	1604 (86.6)	248 (13.4)		1321 (71.3)	531 (28.7)		1540 (83.2)	312 (16.8)		1554 (83.9)	298 (16.1)	
Disagree	12 (0.6)	9 (75)	3 (25)		7 (58.3)	5 (41.7)		10 (83.3)	2 (16.7)		8 (66.7)	4 (33.3)	
Don't know	15 (0.8)	14 (93.3)	1 (6.7)		10 (66.7)	5 (33.3)		12 (80)	3 (20)		11 (73.3)	4 (26.7)	
Contact via contaminated objects				0.863			0.93			0.801			0.23
Agree	1817 (96.7)	1574 (86.6)	243 (13.4)		1295 (71.3)	522 (28.7)		1509 (83)	308 (17)		1526 (84)	291 (16)	
Disagree	25 (1.3)	22 (88)	3 (12)		17 (68)	8 (32)		22 (88)	3 (12)		19 (76)	6 (24)	
Don't know	37 (2)	31 (83.8)	6 (16.2)		26 (70.3)	11 (29.7)		31 (83.8)	6 (16.2)		28 (75.7)	9 (24.3)	
Airborne				0.42			0.428			0.09			0.141
Agree	664 (35.3)	578 (87)	86 (13)		485 (73)	179 (27)		567 (85.4)	97 (14.6)		571 (86)	93 (14)	
Disagree	912 (48.5)	781 (85.6)	131 (14.4)		641 (70.3)	271 (29.7)		741 (81.3)	171 (18.8)		752 (82.5)	160 (17.5)	
Don't know	303 (16.1)	268 (88.4)	35 (11.6)		212 (70)	91 (30)		254 (83.8)	49 (16.2)		250 (82.5)	53 (17.5)	
Satisfaction with the amount of health information available about COVID-19				< 0.001			< 0.001			< 0.001			< 0.001
Very satisfied	306 (16.3)	280 (91.5)	26 (8.5)		243 (79.4)	63 (20.6)		277 (90.5)	29 (9.5)		273 (89.2)	33 (10.8)	
Satisfied	1137 (60.5)	1009 (88.7)	128 (11.3)		828 (72.8)	309 (27.2)		960 (84.4)	177 (15.6)		985 (86.6)	152 (13.4)	
Dissatisfied	347 (18.5)	279 (80.4)	68 (19.6)		221 (63.7)	126 (36.3)		268 (77.2)	79 (22.8)		263 (75.8)	84 (24.2)	
Very dissatisfied	67 (3.6)	45 (67.2)	22 (32.8)		34 (50.7)	33 (49.3)		43 (64.2)	24 (35.8)		40 (59.7)	27 (40.3)	
Don't know	22 (1.2)	14 (63.6)	8 (36.4)		12 (54.5)	10 (45.5)		14 (63.6)	8 (36.4)		12 (54.5)	10 (45.5)	
Number of cases infected by COVID-19													
Heard	1879 (100)	1627 (86.6)	252 (13.4)		1338 (71.2)	541 (28.8)		1562 (83.1)	317 (16.9)		1573 (83.7)	306 (16.3)	
Not Heard	0 (0)	0 (0)	0 (0)		0 (0)	0 (0)		0 (0)	0 (0)		0 (0)	0 (0)	.
Number of deaths infected by COVID-19				0.431			0.867			0.664			0.377
Heard	1875 (99.8)	1623 (86.6)	252 (13.4)		1335 (71.2)	540 (28.8)		1559 (83.1)	316 (16.9)		1569 (83.7)	306 (16.3)	
Not Heard	4 (0.2)	4 (100)	0 (0)		3 (75)	1 (25)		3 (75)	1 (25)		4 (100)	0 (0)	
Number of recovered cases infected by COVID-19				0.003			0.005			0.085			0.002
Heard	1860 (99)	1615 (86.8)	245 (13.2)		1330 (71.5)	530 (28.5)		1549 (83.3)	311 (16.7)		1562 (84)	298 (16)	
Not Heard	19 (1)	12 (63.2)	7 (36.8)		8 (42.1)	11 (57.9)		13 (68.4)	6 (31.6)		11 (57.9)	8 (42.1)	
Main source of health information				0.045			< 0.001			< 0.001			0.155
Social Media & Internet	1463 (77.9)	1250 (85.4)	213 (14.6)		1008 (68.9)	455 (31.1)		1188 (81.2)	275 (18.8)		1210 (82.7)	253 (17.3)	
Traditional Media	330 (17.6)	300 (90.9)	30 (9.1)		259 (78.5)	71 (21.5)		293 (88.8)	37 (11.2)		287 (87)	43 (13)	
Family Members	20 (1.1)	17 (85)	3 (15)		16 (80)	4 (20)		19 (95)	1 (5)		17 (85)	3 (15)	
Others	66 (3.5)	60 (90.9)	6 (9.1)		55 (83.3)	11 (16.7)		62 (93.9)	4 (6.1)		59 (89.4)	7 (10.6)	
Average number of hours spent on social media				0.582			0.732			0.441			0.348
0 - 9	788 (88.4)	668 (84.8)	120 (15.2)		535 (67.9)	253 (32.1)		628 (79.7)	160 (20.3)		646 (82)	142 (18)	
10 - 19	97 (10.9)	82 (84.5)	15 (15.5)		62 (63.9)	35 (36.1)		76 (78.4)	21 (21.6)		76 (78.4)	21 (21.6)	
20 - 24	6 (0.7)	6 (100)	0 (0)		4 (66.7)	2 (33.3)		6 (100)	0 (0)		6 (100)	0 (0)	
Level of confidence in own doctor's ability to diagnose or recognize COVID-19				0.017			0.001			0.006			0.006
Very confident	571 (30.4)	513 (89.8)	58 (10.2)		442 (77.4)	129 (22.6)		501 (87.7)	70 (12.3)		499 (87.4)	72 (12.6)	
Somewhat confident	909 (48.4)	783 (86.1)	126 (13.9)		627 (69)	282 (31)		739 (81.3)	170 (18.7)		758 (83.4)	151 (16.6)	
Not very confident	232 (12.3)	191 (82.3)	41 (17.7)		150 (64.7)	82 (35.3)		182 (78.4)	50 (21.6)		184 (79.3)	48 (20.7)	
Not at all confident	29 (1.5)	22 (75.9)	7 (24.1)		20 (69)	9 (31)		24 (82.8)	5 (17.2)		20 (69)	9 (31)	
Do not know	138 (7.3)	118 (85.5)	20 (14.5)		99 (71.7)	39 (28.3)		116 (84.1)	22 (15.9)		112 (81.2)	26 (18.8)	

(*continued on next page*)

Table 4 (*continued*)

Variable	*n* (%)	Stress		*p*-value*	Anxiety		*p*-value*	Depression		*p*-value*	Impact of event		*p*-value*
		Normal and Mild *n* (%)	At least Moderate *n* (%)		Normal and Mild *n* (%)	At least Moderate *n* (%)		Normal and Mild *n* (%)	At least Moderate *n* (%)		Normal and Mild *n* (%)	At least Moderate *n* (%)	
Likelihood of contracting COVID-19 during the current outbreak				0.027			0.001			0.035			0.403
Very likely	153 (8.1)	126 (82.4)	27 (17.6)		97 (63.4)	56 (36.6)		115 (75.2)	38 (24.8)		120 (78.4)	33 (21.6)	
Somewhat likely	605 (32.2)	514 (85)	91 (15)		404 (66.8)	201 (33.2)		495 (81.8)	110 (18.2)		511 (84.5)	94 (15.5)	
Not very likely	683 (36.3)	601 (88)	82 (12)		512 (75)	171 (25)		580 (84.9)	103 (15.1)		578 (84.6)	105 (15.4)	
Not likely at all	307 (16.3)	278 (90.6)	29 (9.4)		233 (75.9)	74 (24.1)		262 (85.3)	45 (14.7)		254 (82.7)	53 (17.3)	
Do not know	131 (7)	108 (82.4)	23 (17.6)		92 (70.2)	39 (29.8)		110 (84)	21 (16)		110 (84)	21 (16)	
Likelihood of surviving COVID-19 if infected				0.001			< 0.001			0.001			< 0.001
Very likely	750 (39.9)	662 (88.3)	88 (11.7)		565 (75.3)	185 (24.7)		633 (84.4)	117 (15.6)		646 (86.1)	104 (13.9)	
Somewhat likely	847 (45.1)	739 (87.2)	108 (12.8)		598 (70.6)	249 (29.4)		709 (83.7)	138 (16.3)		710 (83.8)	137 (16.2)	
Not very likely	115 (6.1)	88 (76.5)	27 (23.5)		60 (52.2)	55 (47.8)		82 (71.3)	33 (28.7)		86 (74.8)	29 (25.2)	
Not likely at all	36 (1.9)	26 (72.2)	10 (27.8)		22 (61.1)	14 (38.9)		25 (69.4)	11 (30.6)		23 (63.9)	13 (36.1)	
Do not know	131 (7)	112 (85.5)	19 (14.5)		93 (71)	38 (29)		113 (86.3)	18 (13.7)		108 (82.4)	23 (17.6)	
Concerns about other family members getting COVID-19				< 0.001			< 0.001			< 0.001			< 0.001
Very worried	1141 (60.7)	933 (81.8)	208 (18.2)		727 (63.7)	414 (36.3)		895 (78.4)	246 (21.6)		891 (78.1)	250 (21.9)	
Somewhat worried	626 (33.3)	590 (94.2)	36 (5.8)		514 (82.1)	112 (17.9)		565 (90.3)	61 (9.7)		578 (92.3)	48 (7.7)	
Not very worried	73 (3.9)	67 (91.8)	6 (8.2)		63 (86.3)	10 (13.7)		66 (90.4)	7 (9.6)		68 (93.2)	5 (6.8)	
Not worried at all	15 (0.8)	14 (93.3)	1 (6.7)		14 (93.3)	1 (6.7)		14 (93.3)	1 (6.7)		14 (93.3)	1 (6.7)	
Do not have family member	24 (1.3)	23 (95.8)	1 (4.2)		20 (83.3)	4 (16.7)		22 (91.7)	2 (8.3)		22 (91.7)	2 (8.3)	
Concerns about a child younger than 16 years getting COVID-19				0.279			0.005			0.086			0.051
Very worried	610 (32.5)	515 (84.4)	95 (15.6)		408 (66.9)	202 (33.1)		490 (80.3)	120 (19.7)		490 (80.3)	120 (19.7)	
Somewhat worried	358 (19.1)	314 (87.7)	44 (12.3)		256 (71.5)	102 (28.5)		300 (83.8)	58 (16.2)		313 (87.4)	45 (12.6)	
Not very worried	129 (6.9)	117 (90.7)	12 (9.3)		104 (80.6)	25 (19.4)		115 (89.1)	14 (10.9)		110 (85.3)	19 (14.7)	
Not worried at all	38 (2)	34 (89.5)	4 (10.5)		32 (84.2)	6 (15.8)		34 (89.5)	4 (10.5)		33 (86.8)	5 (13.2)	
Do not have children	744 (39.6)	647 (87)	97 (13)		538 (72.3)	206 (27.7)		623 (83.7)	121 (16.3)		627 (84.3)	117 (15.7)	
Feeling of being discriminated by other countries due to the outbreak of COVID-19				0.001			< 0.001			0.004			< 0.001
Yes	291 (15.5)	234 (80.4)	57 (19.6)		171 (58.8)	120 (41.2)		225 (77.3)	66 (22.7)		208 (71.5)	83 (28.5)	
No	1588 (84.5)	1393 (87.7)	195 (12.3)		1167 (73.5)	421 (26.5)		1337 (84.2)	251 (15.8)		1365 (86)	223 (14)	

* The Chi-square statistic is significant at $p < 0.05$ level.

Table 5
Precautionary measures in the past 14 days and association with psychological impact ($n = 1879$).

Variable	n (%)	Stress		p-value*	Anxiety		p-value*	Depression		p-value*	Impact of event		p-value*
		Normal and Mild n (%)	At least Moderate n (%)		Normal and Mild n (%)	At least Moderate n (%)		Normal and Mild n (%)	At least Moderate n (%)		Normal and Mild n (%)	At least Moderate n (%)	
Covering mouth when coughing and sneezing				0.632			0.130			0.238			0.879
Always	1317 (70.1)	1143 (86.8)	174 (13.2)		957 (72.7)	360 (27.3)		1105 (83.9)	212 (16.1)		1107 (84.1)	210 (15.9)	
Most of the time	482 (25.7)	411 (85.3)	71 (14.7)		322 (66.8)	160 (33.2)		387 (80.3)	95 (19.7)		397 (82.4)	85 (17.6)	
Sometimes	56 (3)	51 (91.1)	5 (8.9)		43 (76.8)	13 (23.2)		49 (87.5)	7 (12.5)		48 (85.7)	8 (14.3)	
Occasionally	17 (0.9)	16 (94.1)	1 (5.9)		11 (64.7)	6 (35.3)		14 (82.4)	3 (17.6)		15 (88.2)	2 (11.8)	
Never	7 (0.4)	6 (85.7)	1 (14.3)		5 (71.4)	2 (28.6)		7 (100)	0 (0)		6 (85.7)	1 (14.3)	
Avoiding sharing of utensils				0.589			0.091			0.514			0.867
Always	923 (49.1)	795 (86.1)	128 (13.9)		676 (73.2)	247 (26.8)		776 (84.1)	147 (15.9)		765 (82.9)	158 (17.1)	
Most of the time	423 (22.5)	375 (88.7)	48 (11.3)		286 (67.6)	137 (32.4)		345 (81.6)	78 (18.4)		360 (85.1)	63 (14.9)	
Sometimes	219 (11.7)	191 (87.2)	28 (12.8)		161 (73.5)	58 (26.5)		187 (85.4)	32 (14.6)		185 (84.5)	34 (15.5)	
Occasionally	123 (6.5)	105 (85.4)	18 (14.6)		79 (64.2)	44 (35.8)		99 (80.5)	24 (19.5)		102 (82.9)	21 (17.1)	
Never	191 (10.2)	161 (84.3)	30 (15.7)		136 (71.2)	55 (28.8)		155 (81.2)	36 (18.8)		161 (84.3)	30 (15.7)	
Washing hands with soap and water				0.034			0.007			0.070			0.291
Always	1534 (81.6)	1337 (87.2)	197 (12.8)		1109 (72.3)	425 (27.7)		1286 (83.8)	248 (16.2)		1292 (84.2)	242 (15.8)	
Most of the time	307 (16.3)	263 (85.7)	44 (14.3)		207 (67.4)	100 (32.6)		250 (81.4)	57 (18.6)		253 (82.4)	54 (17.6)	
Sometimes	32 (1.7)	23 (71.9)	9 (28.1)		21 (65.6)	11 (34.4)		22 (68.8)	10 (31.3)		24 (75)	8 (25)	
Occasionally	6 (0.3)	4 (66.7)	2 (33.3)		1 (16.7)	5 (83.3)		4 (66.7)	2 (33.3)		4 (66.7)	2 (33.3)	
Never	0 (0)	0 (0)	0 (0)		0 (0)	0 (0)		0 (0)	0 (0)		0 (0)	0 (0)	
Washing hands immediately after coughing, rubbing nose or sneezing				0.067			0.486			0.606			0.172
Always	1053 (56)	926 (87.9)	127 (12.1)		763 (72.5)	290 (27.5)		884 (84)	169 (16)		899 (85.4)	154 (14.6)	
Most of the time	521 (27.7)	443 (85)	78 (15)		360 (69.1)	161 (30.9)		426 (81.8)	95 (18.2)		426 (81.8)	95 (18.2)	
Sometimes	215 (11.4)	187 (87)	28 (13)		155 (72.1)	60 (27.9)		180 (83.7)	35 (16.3)		178 (82.8)	37 (17.2)	
Occasionally	68 (3.6)	52 (76.5)	16 (23.5)		44 (64.7)	24 (35.3)		53 (77.9)	15 (22.1)		52 (76.5)	16 (23.5)	
Never	22 (1.2)	19 (86.4)	3 (13.6)		16 (72.7)	6 (27.3)		19 (86.4)	3 (13.6)		18 (81.8)	4 (18.2)	
Wearing mask regardless of presence or absence of symptoms				0.011			0.077			0.277			0.366
Always	740 (39.4)	656 (88.6)	84 (11.4)		554 (74.9)	186 (25.1)		630 (85.1)	110 (14.9)		626 (84.6)	114 (15.4)	
Most of the time	452 (24.1)	382 (84.5)	70 (15.5)		316 (69.9)	136 (30.1)		375 (83)	77 (17)		383 (84.7)	69 (15.3)	
Sometimes	335 (17.8)	295 (88.1)	40 (11.9)		229 (68.4)	106 (31.6)		271 (80.9)	64 (19.1)		276 (82.4)	59 (17.6)	
Occasionally	225 (12)	195 (86.7)	30 (13.3)		152 (67.6)	73 (32.4)		186 (82.7)	39 (17.3)		189 (84)	36 (16)	
Never	127 (6.8)	99 (78)	28 (22)		87 (68.5)	40 (31.5)		100 (78.7)	27 (21.3)		99 (78)	28 (22)	
Washing hands after touching contaminated objects				0.023			0.086			0.116			0.074
Always	1315 (70)	1159 (88.1)	156 (11.9)		961 (73.1)	354 (26.9)		1112 (84.6)	203 (15.4)		1111 (84.5)	204 (15.5)	
Most of the time	417 (22.2)	351 (84.2)	66 (15.8)		281 (67.4)	136 (32.6)		334 (80.1)	83 (19.9)		351 (84.2)	66 (15.8)	
Sometimes	108 (5.7)	87 (80.6)	21 (19.4)		71 (65.7)	37 (34.3)		87 (80.6)	21 (19.4)		80 (74.1)	28 (25.9)	
Occasionally	30 (1.6)	23 (76.7)	7 (23.3)		20 (66.7)	10 (33.3)		22 (73.3)	8 (26.7)		24 (80)	6 (20)	
Never	9 (0.5)	7 (77.8)	2 (22.2)		5 (55.6)	4 (44.4)		7 (77.8)	2 (22.2)		7 (77.8)	2 (22.2)	
Average number of hours per day staying at home to avoid COVID-19				0.289			0.026			0.005			0.056
0-9	493 (26.2)	426 (86.4)	67 (13.6)		373 (75.7)	120 (24.3)		430 (87.2)	63 (12.8)		428 (86.8)	65 (13.2)	
10-19	405 (21.6)	360 (88.9)	45 (11.1)		289 (71.4)	116 (28.6)		341 (84.2)	64 (15.8)		341 (84.2)	64 (15.8)	
20-24	981 (52.2)	841 (85.7)	140 (14.3)		676 (68.9)	305 (31.1)		791 (80.6)	190 (19.4)		804 (82)	177 (18)	
Feeling that too much unnecessary worry has been made about COVID-19				<0.001			0.002			<0.001			<0.001
Always	213 (11.3)	162 (76.1)	51 (23.9)		128 (60.1)	85 (39.9)		154 (72.3)	59 (27.7)		148 (69.5)	65 (30.5)	
Most of the time	455 (24.2)	405 (89)	50 (11)		322 (70.8)	133 (29.2)		384 (84.4)	71 (15.6)		386 (84.8)	69 (15.2)	
Sometime	457 (24.3)	416 (91)	41 (9)		344 (75.3)	113 (24.7)		390 (85.3)	67 (14.7)		401 (87.7)	56 (12.3)	
Occasional	312 (16.6)	263 (84.3)	49 (15.7)		221 (70.8)	91 (29.2)		256 (82.1)	56 (17.9)		264 (84.6)	48 (15.4)	
Never	442 (23.5)	381 (86.2)	61 (13.8)		323 (73.1)	119 (26.9)		378 (85.5)	64 (14.5)		374 (84.6)	68 (15.4)	

* The Chi-square statistic is significant at $p < 0.05$ level.

3.6. Precautionary measures against COVID-19 and association with psychological impact

The majority practiced the precautionary measures against COVID-19 in the 14 days prior to responding to the survey as shown in Table 5. Majority of the respondents stayed at home for 20-24 hours a day to avoid COVID-19. About 35.5% of respondents almost always felt that too much worry had been made about COVID-19.

The practice of washing hands after touching contaminated objects and the wearing of masks regardless of the presence or absence of symptoms were associated with low stress scores ($p < 0.05$). While the practice of always washing hands with soap and water was associated with both low stress ($p = 0.034$) and anxiety ($p = 0.007$) scores.

The long hours of staying at home (20-24 hours) was associated with high scores in the anxiety ($p = 0.026$) and depression ($p = 0.005$) subscales. Those who always felt that there was too much unnecessary worry about COVID-19 had high scores for IES-R ($p < 0.001$), and subscale scores for stress ($p < 0.001$), anxiety ($p = 0.002$) and depression ($p < 0.001$).

3.7. Additional health information and association with psychological impact

Table 6 shows that 70% of respondents wanted additional health information about COVID-19. Those who wanted additional information, details on symptoms, advice on prevention and treatment, regular updates for latest information and for the outbreaks in their local area, advice for people who might need more tailored information, information on the availability and effectiveness of medicine/vaccine for COVID-19 and updates on the route of transmission of the virus were all associated with significantly high scores for DASS anxiety subscale and IES-R. Those who need latest updates on the number of people infected and their location, travel advice and updates on how other countries handle the outbreak were associated with significantly high anxiety scores ($p < 0.05$).

4. Discussion

This survey was conducted in the first month that COVID-19 was declared a pandemic and enhanced community quarantine was implemented in the Philippines. To our knowledge, this was the first study that examined the psychological impact of COVID-19 to the general population in the country. During this time, 16.3% of the respondents reported moderate to severe psychological impact; 16.9% of the respondents reported moderate to severe depressive symptoms; 28.8% reported moderate to severe anxiety symptoms; and 13.4% reported moderate to severe stress signals. However, these levels were lower than the rates reported by Salari et al. (2020) which were 33.7%, 31.9% and 29.6% for depression, anxiety, and stress respectively. In China, the majority reported worse psychological impact with overall mean IES-R scores more than 24 points, indicating the presence of post-traumatic stress disorder symptoms (Wang et al., 2020a; Wang et al., 2020b). Different populations in the world have been experiencing pandemic fear which can worsen feelings of anxiety that can lead to mental health disorders. Previous experiences of outbreaks like those caused by SARS, Ebola, and MERS-CoV contribute to heightening the impact of the present pandemic.

The study shows that females are more affected than males. The less educated, single people, children and adolescents, those who have no children reported high levels of stress, anxiety, depression and psychological impact. These subgroups, considered at greater risk for adverse psychological outcomes during a public health crisis, may be experiencing low social and emotional support, increased perceived threat to well-being and feelings of fear, isolation and uncertainty (Perrin et al., 2009).

The students reported greater psychological impact as well as more depressive, anxiety and stress symptoms compared to those who are employed. The results were comparable to reports among the Chinese students (Wang et al., 2020b). Contributing factors include effects on daily life and routine, academic delays, and perhaps reduced social support (Cao et al., 2020).

During pandemics, healthcare workers are at the front lines. They are subjected to long working hours, risk of infection, shortages of protective equipment, loneliness, exhaustion and separation from families (Kang et al., 2020). They are at a significant risk of adverse mental health outcomes. However, our study shows that HCPs had lower levels of psychological impact, and symptoms of stress and depression than non-HCPs, comparable to the survey done among health care workers in Singapore (Tan et al., 2020). This can be due to their strong sense of duty and ability to adapt to crisis. It can also be because the survey was done during the early parts of the pandemic when cases were still low and the health care system was not yet overwhelmed. As the pandemic ensues, mental health policies are needed to support our HCPs and other front-line workers.

In this study, most respondents rated their current health status as good. They feel that they are less likely to contract COVID-19 and more likely to survive the infection if they do get infected. They were also confident of their own doctors' abilities. These perceptions seemed to be protective against adverse mental health state. It was reported that almost half of the respondents had at least one physical symptom within the last two weeks, but only 5% had a recent visit with their doctors for consultation. This disparity between symptoms suggestive of COVID-19 and health-seeking behavior may be due to factors like physical limitations caused by community quarantine, closed outpatient clinics, fear of getting infected in hospitals, and lack of public transportation. The presence of any of these symptoms and consequent imposed quarantine by a health authority was associated with psychological distress as also found among the Chinese population (Wang et al., 2020a). In severe instances where presence of symptoms cause social discrimination and avoidance, or lack of basic needs cause hopelessness, the more vulnerable individuals commit suicide (Garger, 2020; Mamun and Griffiths, 2020; Rajkumar, 2020a; Sher, 2020).

In the Philippines where universal health care is not yet fully implemented, the 60% of respondents who had medical health coverage had less anxiety symptoms as compared to those who had none. The government's health aid through the Philippine Health Insurance Corporation (2020) which assured to cover the full cost of COVID-19 hospitalization to its members may have had a positive effect on the public's mental health.

During the initial phase of the lockdowns in the Philippines, majority of the respondents spent an average of 0-9 hours on social media to derive information and news. Those who had access and were satisfied to updated information experienced less psychological impact and lower levels of stress, anxiety and depression. Still many express the need for additional and up-to-date information. They were showing signs of anxiety and moderate psychological impact which may lead to "headline stress disorder" (Dong and Zeng, 2020). Shared information that is relevant and unambiguous may alleviate panic and stress (Hiremath et al., 2020). A more consistent public education is needed to decrease uncertainties that are associated with more emotional reactions.

It appeared that those who practice hand hygiene and wear face masks as precautionary measures have protective effects on psychological status. Wearing a face mask is generally recognized to prevent a sick person from transmitting the virus while also protecting the wearer from getting infected. At the time of the survey, many establishments have imposed a "no mask-no entry" policy.

The restriction in social mobility to control the pandemic is stressful as it prevents face-to-face connections and traditional social interactions (Zhang et al., 2020). Those who can go out like the workers who provide essential services exhibited less symptoms of anxiety and

Table 6
Additional health information required and association with psychological impact ($n = 1879$).

Variable	*n* (%)	Stress			Anxiety			Depression			Impact of event		
		Normal and Mild *n* (%)	At least Moderaten (%)	*p*-value*	Normal and Mild *n* (%)	At least Moderate *n* (%)	*p*-value*	Normal and Mild *n* (%)	At least Moderate *n* (%)	*p*-value*	Normal and Mild *n* (%)	At least Moderate *n* (%)	*p*-value*
Need for additional information about COVID-19				0.209			0.003			0.14			0.011
Yes	1316 (70)	1131 (85.9)	185 (14.1)		910 (69.1)	406 (30.9)		1083 (82.3)	233 (17.7)		1083 (82.3)	233 (17.7)	
No	563 (30)	496 (88.1)	67 (11.9)		428 (76)	135 (24)		479 (85.1)	84 (14.9)		490 (87)	73 (13)	
Need for details on symptoms of COVID-19 infection				0.153			0.002			0.065			0.005
No	672 (35.8)	592 (88.1)	80 (11.9)		508 (75.6)	164 (24.4)		573 (85.3)	99 (14.7)		584 (86.9)	88 (13.1)	
Yes	1207 (64.2)	1035 (85.7)	172 (14.3)		830 (68.8)	377 (31.2)		989 (81.9)	218 (18.1)		989 (81.9)	218 (18.1)	
Need on advice on prevention of COVID-19 infection				0.223			0.032			0.236			0.044
No	653 (34.8)	574 (87.9)	79 (12.1)		485 (74.3)	168 (25.7)		552 (84.5)	101 (15.5)		562 (86.1)	91 (13.9)	
Yes	1226 (65.2)	1053 (85.9)	173 (14.1)		853 (69.6)	373 (30.4)		1010 (82.4)	216 (17.6)		1011 (82.5)	215 (17.5)	
Need for advice on treatment of COVID-19				0.177			0.004			0.198			0.010
No	591 (31.5)	521 (88.2)	70 (11.8)		447 (75.6)	144 (24.4)		501 (84.8)	90 (15.2)		514 (87)	77 (13)	
Yes	1288 (68.5)	1106 (85.9)	182 (14.1)		891 (69.2)	397 (30.8)		1061 (82.4)	227 (17.6)		1059 (82.2)	229 (17.8)	
Need for regular updates for latest information about COVID-19 infection				0.292			0.014			0.177			0.050
No	606 (32.3)	532 (87.8)	74 (12.2)		454 (74.9)	152 (25.1)		514 (84.8)	92 (15.2)		522 (86.1)	84 (13.9)	
Yes	1273 (67.7)	1095 (86)	178 (14)		884 (69.4)	389 (30.6)		1048 (82.3)	225 (17.7)		1051 (82.6)	222 (17.4)	
Need for latest updates for outbreaks in the local area				0.338			0.013			0.376			0.017
No	639 (34)	560 (87.6)	79 (12.4)		478 (74.8)	161 (25.2)		538 (84.2)	101 (15.8)		553 (86.5)	86 (13.5)	
Yes	1240 (66)	1067 (86)	173 (14)		860 (69.4)	380 (30.6)		1024 (82.6)	216 (17.4)		1020 (82.3)	220 (17.7)	
Need for advice for people who may need more tailored information, such as those with pre-existing illness				0.433			0.004			0.203			0.018
No	645 (34.3)	564 (87.4)	81 (12.6)		486 (75.3)	159 (24.7)		546 (84.7)	99 (15.3)		558 (86.5)	87 (13.5)	
Yes	1234 (65.7)	1063 (86.1)	171 (13.9)		852 (69)	382 (31)		1016 (82.3)	218 (17.7)		1015 (82.3)	219 (17.7)	
Need for information on availability and effectiveness of medicine/vaccine for COVID-19 infection				0.254			0.002			0.148			0.013
No	580 (30.9)	510 (87.9)	70 (12.1)		441 (76)	139 (24)		493 (85)	87 (15)		504 (86.9)	76 (13.1)	
Yes	1299 (69.1)	1117 (86)	182 (14)		897 (69.1)	402 (30.9)		1069 (82.3)	230 (17.7)		1069 (82.3)	230 (17.7)	
Need for latest updates on the number of people infected by COVID-19 and their location				0.546			0.003			0.271			0.053
No	643 (34.2)	561 (87.2)	82 (12.8)		486 (75.6)	157 (24.4)		543 (84.4)	100 (15.6)		553 (86)	90 (14)	
Yes	1236 (65.8)	1066 (86.2)	170 (13.8)		852 (68.9)	384 (31.1)		1019 (82.4)	217 (17.6)		1020 (82.5)	216 (17.5)	
Need for travel advice				0.359			0.026			0.239			0.317
No	773 (41.1)	676 (87.5)	97 (12.5)		572 (74)	201 (26)		652 (84.3)	121 (15.7)		655 (84.7)	118 (15.3)	
Yes	1106 (58.9)	951 (86)	155 (14)		766 (69.3)	340 (30.7)		910 (82.3)	196 (17.7)		918 (83)	188 (17)	
Need for updates on the routes of transmission of COVID-19				0.341			0.003			0.119			0.019
No	707 (37.6)	619 (87.6)	88 (12.4)		532 (75.2)	175 (24.8)		600 (84.9)	107 (15.1)		610 (86.3)	97 (13.7)	
Yes	1172 (62.4)	1008 (86)	164 (14)		806 (68.8)	366 (31.2)		962 (82.1)	210 (17.9)		963 (82.2)	209 (17.8)	
Need for updates on how other countries handle the COVID-19 outbreak				0.136			0.006			0.105			0.07
No	637 (33.9)	562 (88.2)	75 (11.8)		479 (75.2)	158 (24.8)		542 (85.1)	95 (14.9)		547 (85.9)	90 (14.1)	
Yes	1242 (66.1)	1065 (85.7)	177 (14.3)		859 (69.2)	383 (30.8)		1020 (82.1)	222 (17.9)		1026 (82.6)	216 (17.4)	

* The Chi-square statistic is significant at $p < 0.05$ level.

depression compared to those who stay 20 to 24 hours at home. Those who exhibit COVID-related symptoms or potential contacts of COVID were isolated and separated from loved ones. The imposed quarantine as seen in previous outbreaks has associated negative psychological effects that may be linked to fears of having the infection and spreading it to family members; frustration and boredom from being isolated; duration of uncertainty and scarcity of basic supplies (Brooks et al., 2020). While isolation may be a necessary preventive measure, adequate information, opening lines of communication and provision of essential supplies to those confined may improve psychosocial outcomes (Brooks et al., 2020).

The present study has some limitations. First, the survey was done online and administered in the English language. Majority of respondents were well educated with access to the internet. Second, the snowball sampling strategy was initiated within the social network of academicians and healthcare professionals and may not be representative of the general population. Third, the survey was rolled in the early phase of the pandemic and the psychological outcomes may change over the course of the public health crisis.

5. Conclusion

During the early phase of the COVID-19 pandemic in the Philippines, one-fourth of the respondents reported moderate-to-severe anxiety, one-seventh reported moderate-to-severe stress levels and one-sixth reported moderate-to-severe depression and psychological impact of the outbreak. Female gender, youth age of 12-21 years, single status, students, presence of specific physical symptoms (i.e., headache, cough, chills), recent imposed quarantine by a health authority, prolonged stay at home, poor self-reported health status, feeling of too much unnecessary worry has been made about COVID-19, concerns about family members getting sick, and feeling of being discriminated by other countries were associated with a greater psychological impact of the pandemic and higher levels of stress, anxiety and depression. Timely and accurate health information, having children older than 16 years old, perception of good health status and confidence in their own health care providers were associated with lesser psychological impact of the pandemic and lower levels of stress, anxiety and depression. The findings of this study can be used to frame appropriate psychological interventions to avert occurrence of mental health problems preventing psychological crisis.

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Declaration of Competing Interests

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