



## Letter to the Editor

## COVID-19 related information and psychological distress: Too much or too bad?

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## Dear Editors,

The role of mass media information and misinformation has been widely discussed during the COVID-19 pandemic (Lee et al., 2020; Garfin et al., 2020; Su et al., 2021). However, little is known about the psychological impact of COVID-19 related information on the general population. We conducted a systematic national assessment to delineate the psychological impact of the *quality* and *quantity* of COVID-19 related information in the general public.

A multi-item valid and reliable questionnaire was deployed online (via social media sites and Amazon mTurk) across the United States after approval from the Institutional Review Board. Standard closed format questions were used to collect information on the sociodemographic characteristics of the study population and the PHQ-4 scale was used to assess the prevalence of depression, anxiety, and psychological distress (i.e., symptoms of both depression and anxiety) (Khubchandani et al., 2021; Olagoke et al., 2020). The level of concern in the study participants about the *quantity* of COVID-19 related information (i.e., the number of information sources, options for information, and volume of information) was distributed as: very concerned (16%), concerned (33%), slightly concerned (32%), not concerned at all (19%). Similarly, we assessed the level of concern in the study participants about the *quality* of COVID-19 related information (i.e., truthfulness, accuracy, and reliability of the information on symptoms, prevalence, effects, etc.), and the responses were distributed as: very concerned (30%), concerned (34%), slightly concerned (28%), not concerned at all (8%).

A total of 1856 individuals participated in the study and the majority of the study participants were: females (51%), whites (74%), non-Hispanic (81%), married (56%), without children at home (53%), bachelors degree holders (78%), and employed full time (68%). The prevalence of depression, anxiety, and severe psychological distress as assessed by the PHQ-4 were: 39%, 42%, and 13% respectively [Table 1]. Demographic characteristics and psychological outcomes were compared among groups that were very concerned/concerned versus slightly/not concerned at all about the quantity and quality of COVID-19 related information. Those who were concerned about the *quantity* of COVID-19 related information were statistically significantly ( $p < 0.05$ ) more

likely to be: 18–25 years old (56%), African-Americans (57%), Hispanics (57%), married (53%), with children at home (54%), urban dwellers (56%), having incomes  $< \$60,000$  (52%), and  $<$  bachelor's degree (56%). Among those who had depression, anxiety, or severe psychological distress, a statistically significantly higher proportion of individuals reported being concerned or very concerned about the quantity of COVID-19 related information [Table 1]. Those who were concerned about the *quality* of COVID-19 related information were statistically significantly ( $p < 0.05$ ) more likely to be: African-Americans (70%), non-Hispanics (65%), those with  $<$  bachelor's degree (67%), living in the Midwestern U.S (69%), and reported their political affiliation as independent (65%) or other (78%).

Logistic regression analyses were conducted to assess the association between psychological outcomes and level of concerns about the quality and quantity of COVID-19 related information [Table 2]. In unadjusted analysis (model 1), being concerned or very concerned about the quantity of COVID-19 related information was associated with statistically significantly higher odds of depression (OR = 1.75 times), anxiety (OR = 1.80 times), and severe psychological distress (OR = 1.79 times). Despite adjusting for all the sociodemographic characteristics (model 2), the odds of depression, anxiety, and severe psychological distress remained statistically significantly higher for those who were concerned or very concerned about the quantity of COVID-19 related information. Being concerned or very concerned about the quality of COVID-19 information was not statistically significantly associated with depression and anxiety, although a trend was seen with severe psychological distress [Table 2].

Individuals who were younger, racial/ethnic minority, lower-income and education, urban, married, and with children at home were more likely to be concerned about the quantity of COVID-19 related information. Studies suggest that these groups have been disproportionately affected by the many socioeconomic stressors of the COVID-19 pandemic. Also, perceived vulnerability to COVID-19 is linked to depression in vulnerable groups. It can be postulated that mass media may have played a role in further accentuating the psychological distress in these groups (Khubchandani et al., 2020, Khubchandani et al., 2021; Olagoke et al., 2020; Holman et al., 2020). In contrast to a few studies from outside the United States, the most critical finding of this study is

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**Table 1**  
Demographic characteristics, psychological distress, and COVID-19 information related concerns.

Variable	Total Sample N(%)	Concerns about the “Quantity” of COVID-19 related Information		Concerns about the “Quality” of COVID-19 related Information	
		Slightly or Not Concerned at all	Concerned or Very Concerned	Slightly or Not Concerned at all	Concerned or Very Concerned
		N (%)	N (%)	N (%)	N (%)
<b>All Participants</b>	1856(100)	939(51)	917(49)	672(36)	1184(64)
<b>Sex</b>					
Male	906(49)	461(51)	455(49)	338(37)	568(63)
Female	950(51)	478(50)	472(50)	334(35)	616(65)
<b>Age Group</b>					
18–25 years	342(18)	151(44)	191(56)*	124(36)	218(64)
26–40 years	822(44)	419(51)	403(49)	291(35)	531(65)
41–60 years	519(28)	281(54)	238(46)	193(37)	326(63)
≥61 years	173(9)	88(51)	85(49)	64(37)	109(63)
<b>Race</b>					
White	1369(74)	704(51)	665(49)*	495(36)	874(64) *
African-Americans	209(11)	91(43)	118(57)	63(30)	146(70)
Asian	178(10)	95(55)	81(45)	76(43)	102(57)
Multiracial	43(2)	20(47)	23(53)	17(40)	26(60)
Other	57(3)	27(47)	30(53)	21(37)	36(63)
<b>Ethnicity</b>					
Hispanic	355(19)	153(43)	202(57)*	146(51)	209(59) *
Non-Hispanic	1501(81)	786(52)	715(48)	526(35)	975(65)
<b>Marital Status</b>					
Single/never married	603(33)	333(55)	270(45)*	216(36)	387(64)
Married	1042(56)	492(47)	550(53)	376(36)	666(64)
Engaged/living with a partner	95(5)	48(50)	47(50)	34(36)	61(64)
Divorced/separated/widow	116(6)	66(57)	50(43)	46(40)	70(60)
<b>Children at Home</b>					
No	981(53)	533(54)	448(46)*	347(35)	634(65)
Yes	875(47)	406(46)	469(54)	325(37)	550(63)
<b>Education</b>					
< Bachelor’s degree	412(22)	183(44)	229(56) *	135(33)	277(67) *
≥ Bachelor’s degree	1444(78)	710(49)	734(51)	537(37)	907(63)
<b>Current Employment Status</b>					
Full-time	1261(68)	625(50)	636(50)	469(37)	792(63)
Part-time	297(16)	155(52)	142(48)	107(36)	190(64)
Not employed	298(16)	159(53)	139(47)	96(32)	202(68)
<b>Annual Household Income</b>					
0-\$60,000	938(51)	452(48)	486(52)*	335(36)	603(64)
≥60,001	918(49)	487(53)	431(47)	337(37)	581(63)
<b>Area of Residence</b>					
Rural	403(22)	198(49)	205(51)*	131(33)	272(67)
Urban	760(41)	336(44)	424(56)	292(38)	468(62)
Suburban	693(37)	405(58)	288(42)	249(36)	444(64)
<b>Region in USA</b>					
Northeast	242(13)	112(46)	130(54)	97(40)	145(60) *
Midwest	621(34)	321(52)	300(48)	190(31)	431(69)
South	564(30)	302(53)	262(47)	198(35)	366(65)
West	429(23)	204(48)	225(52)	187(44)	242(56)
<b>Political Orientation</b>					
Democrat	852(46)	420(49)	432(51)	324(38)	528(62) *
Republican	510(27)	253(50)	257(50)	193(38)	317(62)
Independent	358(19)	200(56)	158(44)	125(35)	233(65)
Other	136(7)	66(49)	70(51)	30(22)	106(78)
<b>Depression (PHQ-2)</b>					
No	1128(61)	632(56)	496(44) *	404(36)	724(64)
Yes	728(39)	307(42)	421(58)	268(36)	460(64)
<b>Anxiety (GAD-2)</b>					
No	1082(58)	613(57)	469(43) *	394(36)	683(64)
Yes	774(42)	326(42)	448(58)	278(36)	496(64)
<b>Severe Psychological Distress (PHQ-4)</b>					
No	1607(87)	844(52)	763(48) *	92(37)	1015(63)
Yes	249(13)	95(38)	154(62)	80(32)	169(68)

\* indicates  $p < 0.05$  for statistical significance. N(%) indicates frequency and percentage of individuals who selected an option on the variables.

that the quantity but not the quality of COVID-19 related information is associated with poor mental health outcomes and psychological distress (Chao et al., 2020; Lee et al., 2020; Olagoke et al., 2020; Su et al., 2021). Studies before and during the pandemic consistently highlighted a greater association between social media and screen time usage with poor mental health outcomes (Chao et al., 2020; Madhav et al., 2017). Given the results of this study and from previous research, a few strategies to combat psychological distress arising from COVID-19 related media consumption could be: reducing duration and frequency of media

consumption, reducing the number of sources of COVID-19 related information, use of authentic and scientific media sources, avoiding negative emotional states like boredom and loneliness, practicing healthy and alternate coping techniques for stress (e.g. mindfulness), and improvement in lifestyle behaviors such as sleep hygiene and exercise routines (Su et al., 2021; Olagoke et al., 2020; Holman et al., 2020; Sanderson et al., 2020). The reduction in quantity of media consumption can also have beneficial effects on reducing poor quality information consumption related to COVID-19.

**Table 2**

Regression analyses to predict psychological distress based on quantity and quality of COVID-19 related information.

Outcome	Quantity of COVID-19 Information		Quality of COVID-19 Information	
	Model 1 OR (95%CI)	Model 2 AOR (95%CI)	Model 1 OR (95%CI)	Model 2 AOR (95%CI)
Depression	1.75(1.45–2.11) *	1.54(1.25–1.89)*	0.96 (0.79–1.16)	1.03(0.84–1.27)
Anxiety	1.80(1.49–2.17) *	1.58(1.30–1.94)*	1.05(0.83–1.24)	1.10(0.90–1.35)
Severe Psychological Distress	1.79(1.37–2.36) *	1.61(1.21–2.12)*	1.23(0.93–1.64)	1.31(0.98–1.75)

\* indicates  $p < 0.05$ . OR = odds ratios, AOR = adjusted odds ratios, 95%CI = confidence intervals. The binary outcomes were depression, anxiety, and severe psychological distress (yes vs. no). The predictor variables were quantity and quality of COVID-19 related information ('slightly or not concerned at all' served as a reference group compared to 'concerned/very concerned'). Model 1 illustrates unadjusted regression analysis to predict psychological outcomes. Model 2 shows multiple regression analysis after adjusting for all the sociodemographic characteristics from Table 1.

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### Declaration of competing interest

Authors have no conflicts of interests to declare.

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