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The more exposure to media information about COVID-19, the more distressed you will feel

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Dear Editor,

As the coronavirus disease 2019 (COVID-19) pandemic escalates, media outlets are being flooded with all kinds of information about COVID-19, including an increasing number of rumors and untruths. And the public are also eager to receive the latest information about COVID-19 from the media. However, it is suggested that repeated media exposure to public health crises, including infectious diseases, can cause heightened psychological distress (Garfin et al., 2020; Holman et al., 2014). We still don't know whether high levels of COVID-19 media exposure can result in amplified anxiety and depression in the general population as well (Holmes et al., 2020). So, in the current study, we examined the association between media exposure to information about COVID-19 and psychological distress in the general population in China.

Chinese citizens aged ≥18 years were invited to participate with an online questionnaire about the COVID-19 epidemic during Jan 31 and Feb 7, 2020, when the number of COVID-19 infections in China reached its peak and a nationwide stay-at-home order had been issued. Media exposure to information about COVID-19 was assessed by asking respondents how many hours per day (≤1, 2, 3, 4, 5, 6, ≥7) they spent receiving information about COVID-19 from different media sources (e.g., television, radio, newspaper, online websites, and social media) in the past one week (Holman et al., 2014). Psychological distress was measured by the Patient Health Questionnaire (PHQ-9) and the General Anxiety Disorder Scale (GAD-7). Besides, we collected respondents' information on demographics, history of mental illness, and social support (based on the Oslo Social Support Scale [OSSS-3]) (Kocalevent et al., 2018), as well as other COVID-19 exposure covariates by asking respondents whether they were diagnosed with COVID-19; whether they had a history of contact with COVID-19 cases; whether someone close to them was diagnosed with COVID-19; and whether they or someone close to them was working on the front lines of COVID-19 (Table 1). Multivariate linear regression was used to explain the association between media exposure to information about COVID-19 and psychological distress in the general population after adjustment for covariates.

In total, 300 Chinese adults completed the questionnaire; their basic characteristics are show in Table 1. Median level of COVID-19 media

Table 1
Baseline characteristics of respondents (n = 300).

Characteristic	Mean (SD) or n (%)
Age, years	26.5 (SD 6.7)
Gender	
Male	59 (19.7%)
Female	241 (80.3%)
Education	
Associate degree or lower	35 (11.7%)
Bachelor's degree	180 (60%)
Master's degree or higher	85 (28.3%)
Marriage	
Single	257 (85.7%)
Married	39 (13.0%)
Divorced	4 (1.3%)
Monthly income, yuan	
< 2000	97 (32.3%)
2000–4000	44 (14.7%)
4000–6000	50 (16.7%)
6000–8000	31 (10.3%)
8000–10,000	19 (6.3%)
> 10,000	59 (19.7%)
Employment	
Full-time student	127 (42.3%)
Full-time employed	137 (45.7%)
Part-time employed	17 (5.7%)
Unemployed	18 (6%)
Retired	1 (0.3%)
Living area	
Hubei*	14 (4.7%)
Others	286 (95.3%)
Diagnosis of COVID-19	
Yes	0
No	300 (100%)
History of contact with COVID-19 cases	
Yes	35 (11.7%)
No	264 (88.3%)
Someone close to them diagnosed with COVID-19	
Yes	0
No	300 (100%)
Working on the front lines of COVID-19	
Yes	29 (9.67%)
No	271 (90.33%)

(*continued on next page*)

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Table 1 (*continued*)

Characteristic	Mean (SD) or n (%)
Someone close to them working on the front lines of COVID-19	
Yes	42 (14%)
No	258 (86%)
History of mental illness	
Yes	72 (24%)
No	228 (76%)
OSSS-3	9.5 (SD 2.2)
Media exposure to COVID-19, hours per day	
≤1	26 (8.7%)
2	52 (17.3%)
3	55 (18.3%)
4	42 (14%)
5	31 (10.3%)
6	25 (8.3%)
≥7	69 (23%)
PHQ-9	8.3 (SD 6.4)
GAD-7	7.7 (SD 6.2)

* Hubei Province is the epicenter of the COVID-19 epidemic in China.
Abbreviations: COVID-19 = coronavirus disease 2019; OSSS = Oslo Social Support Scale; PHQ-9 = Patient Health Questionnaire 9 Items; GAD = General Anxiety Disorder Scale 7 Items

exposure was 4 (IQR 2–6) hours per day. Mean scores on the PHQ-9 and the GAD-7 were 8.3 (SD 6.4) and 7.7 (SD 6.2) respectively. Multivariate linear regression found that a higher level of COVID-19 media exposure was significantly associated with higher PHQ-9 scores (B = 0.565 [95% CI 0.330–0.799], t = 4.743, P < 0.001) and higher GAD-7 scores (B = 0.741 [95% CI 0.503–0.979], t = 6.138, P < 0.001), even after adjustment for demographics, history of mental illness, social support, and other COVID-19 exposure covariates. The dose-response relationships between COVID-19 media exposure and PHQ-9 and GAD-7 scores are shown in Fig. 1.

To the best of our knowledge, this is the first study that demonstrates a dose-response relationship between media exposure to information about COVID-19 and psychological distress in the healthy population. The negative effects of repeated media exposure on mental health can be seen in other community crises, including the 9/11 terrorist attack, the Boston Marathon Bombings, and the 2014 Ebola epidemic (Garfin et al., 2020; Holman et al., 2014). Media-fueled psychological distress can engender misplaced help-seeking behaviors that will consume large amounts of health care resources. Our study suggests that it may be true of the COVID-19 epidemic as well and necessitates future actions to buffer the negative effects of repeated media exposure to information about COVID-19.

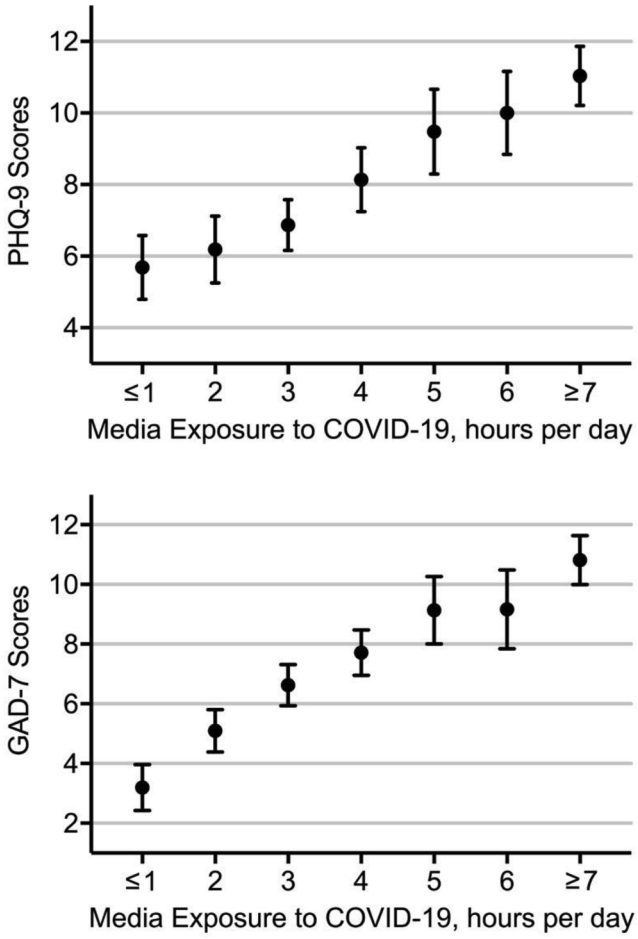

Fig. 1. Dose-response relationship between media exposure to information about COVID-19 in the past one week and psychological distress in the healthy population. COVID-19 = coronavirus disease 2019; PHQ-9 = Patient Health Questionnaire 9 Items; GAD = General Anxiety Disorder Scale 7 Items. Top. PHQ-9 scores by the number of hours per day (≤1, 2, 3, 4, 5, 6, ≥7) of COVID-19 media exposure. Bottom. GAD-7 scores by the number of hours per day (≤1, 2, 3, 4, 5, 6, ≥7) of COVID-19 media exposure. Data are presented as means ± s.d.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.bbi.2020.05.031.

References

Garfin, D.R., Silver, R.C., Holman, E.A., 2020. The novel coronavirus (COVID-2019) outbreak: amplification of public health consequences by media exposure. Health Psychol. 39 (5), 355–357. https://doi.org/10.1037/hea0000875.

Holman, E.A., Garfin, D.R., Silver, R.C., 2014. Media's role in broadcasting acute stress following the Boston Marathon bombings. Proc Natl Acad Sci U S A 111 (1), 93–98. https://doi.org/10.1073/pnas.1316265110.

Holmes, E.A., O'Connor, R.C., Perry, V.H., Tracey, I., Wessely, S., Arseneault, L., Ballard, C., Christensen, H., Cohen Silver, R., Everall, I., Ford, T., John, A., Kabir, T., King, K., Madan, I., Michie, S., Przybylski, A.K., Shafran, R., Sweeney, A., Bullmore, E., 2020. Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. Lancet Psychiatry. https://doi.org/10.1016/S2215-0366(20)30168-1.

Kocalevent, R.-D., Berg, L., Beutel, M.E., Hinz, A., Zenger, M., Härter, M., Nater, U., Brähler, E., 2018. Social support in the general population: standardization of the Oslo social support scale (OSSS-3). BMC Psychol. 6 (1), 31. https://doi.org/10.1186/s40359-018-0249-9.

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