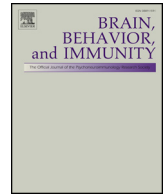




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## COVID-19-related information sources and psychological well-being: An online survey study in Taiwan



Dear editors

Timely and accurate information is foundational to mitigating and curing the coronavirus disease 2019 (COVID-19) for both the public and the scientific community (Hua and Shaw, 2020). Misinformation on COVID-19, however, has also been proliferating on the Internet, especially on social media (Bastani and Bahrami, 2020). Moreover, repeated media exposure to crisis-related information elevates anxiety and stress responses among people (Garfin et al., 2020). The public may also receive information on COVID-19 from medical staff and laypeople. We were interested in the associations between the COVID-19-related information sources and people's psychological well-being. We were also interested in whether the associations differed between health care workers and the public.

The Online Survey Study on COVID-19 in Taiwan recruited participants who were  $\geq 20$  years old and lived in Taiwan through a Facebook advertisement on April 10 to April 20, 2020. We also posted the link of the Facebook advertisement to social media groups joined by health care workers. In the online survey, participants were asked whether they received COVID-19-related information frequently from the following sources: the Internet (including blogs, Internet news, and social media, such as Facebook, Line, Twitter, and Plurk), friends, traditional media (including television, newspapers, and radio broadcasting), formal lessons on COVID-19 (whether online or in-person), medical staff in health care settings, coworkers, and family members. We also assessed participants' level of subjective psychological well-being on a 5-point Likert scale from 1 (much worse) to 5 (much better) (Ko et al., 2006).

In total, the data of 1904 respondents (1282 female and 622 male participants; mean age = 38.0 years and standard deviation [SD] = 10.8 years) were analyzed. The mean score for psychological well-being were 3.3 (SD = 0.9). The major source of information on COVID-19 was the Internet (80.6%), followed by traditional media (53.5%). The associations of each information source with psychological well-being were examined using multiple regression analyses to control for sex, age, education and worry about COVID-19. We found that for non-health-care workers, receiving COVID-19 information from the Internet and from medical staff was negatively and positively related with psychological well-being, respectively; both relationships were significant. For health care workers, receiving COVID-19 information from formal lessons was significantly positively related with psychological well-being.

This study found that approximately 80% of participants received COVID-19 information online. The Internet makes information on COVID-19 more accessible, especially for those staying indoors due to the pandemic, with the websites of official public health organizations being the highest-quality source of online information on COVID-19 and how to prevent it (Hernández-García and Giménez-Júlvez, 2020).

However, use of the Internet as an information source on COVID-19 was significantly associated with poorer psychological well-being for non-health-care workers. Because of the cross-sectional design of the present study, this association may be directional. Misinformation on COVID-19 is rife, especially on social media, despite the efforts of the WHO and Taiwan's Ministry of Health and Welfare in dispelling such misinformation (Bastani and Bahrami, 2020). Because its recipients are unlikely to be able to adjudicate truth from falsity, misinformation results in confusion and anxiety. Furthermore, poor mental health may limit some from searching for information from a variety of sources, and they may obsessively search for COVID-19 information to alleviate their anxiety. These results imply the importance of mental health education, not only education on COVID-19, during this pandemic.

Because Taiwan's Ministry of Health and Welfare recommended health care workers to attend formal lessons (whether online or in-person) on COVID-19, they were more likely to receive COVID-19 information from formal lessons, which resulted in greater psychological well-being. A study in China reported depression, anxiety, insomnia, and distress in a high proportion of health care workers who were ever exposed to information on COVID-19 (Lai et al., 2020). It was the uncertainty surrounding COVID-19, in addition to physical and psychological exhaustion, that resulted in such mental health problems (Neto et al., 2020). Thus, our study and previous studies have demonstrated the necessity of providing timely and transparent formal lessons on COVID-19 for health care workers.

We found that the non-health care workers receiving COVID-19 from medical staff in health care settings had better psychological well-being. People, especially older adults, may receive COVID-19 information from the physicians on their regular or emergent visits for their existing chronic illnesses. Research demonstrated that COVID-19 affects older adults more as well as people with comorbidities, such as hypertension, cardiovascular disease, diabetes, chronic respiratory disease, and chronic kidney disease (Shahid et al., 2020). These groups of people have a greater need for health information. Thus, we suggested that all medical staff, not only frontline staff, must have complete and accurate information on COVID-19 to educate the public; the Internet and television are practical vehicles for public health education during this pandemic (see Table 1).

### 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.

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**Table 1**  
Associations of COVID-19 information sources with subjective psychological well-being.

	Non-health care workers			Health care workers		
	Beta	t	P	Beta	t	P
Males <sup>a</sup>	0.021	0.768	0.443	0.079	1.967	0.050
Age	0.174	6.154	< 0.001	0.080	1.983	0.048
High educational level <sup>b</sup>	0.060	2.180	0.029	0.027	0.689	0.491
Worry toward COVID-19	−0.188	−6.832	< 0.001	−0.181	−4.598	< 0.001
Information from the internet	−0.086	−3.072	0.002	−0.029	−0.674	0.500
Information from friends	0.004	0.143	0.887	−0.029	−0.648	0.517
Information from traditional media	0.029	0.989	0.323	−0.062	−1.340	0.181
Information from academic lessons	−0.003	−0.099	0.921	0.146	2.910	0.004
Information from medical staff	0.091	2.885	0.004	−0.080	−1.455	0.146
Information from work colleagues	−0.004	−0.128	0.898	−0.064	−1.247	0.213
Information from family members	0.047	1.493	0.136	0.056	1.283	0.200

<sup>a</sup> Female as reference.

<sup>b</sup> High school or below as reference.

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### Author contributions

CFY and NYK designed and conducted the study. YLC, DJL, CCC and YHL analyzed the data. CFY, WHL, PWW, STH and YPC drafted the manuscript. All authors contributed to data analysis, drafting or revising the article, gave final approval of the version to be published, and agree to be accountable for all aspects of the work.

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