

Mental health status and isolation/quarantine during the COVID-19 outbreak: A large-sample-size study of the Chinese population

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COVID-19, which first emerged in December 2019,¹ has caused a global pandemic.² Quarantine/isolation is an effective measure to control virus transmission, but may have negative effects on mental health.³ At present, there are few studies on the relation between mental health and quarantine/isolation during the COVID-19 outbreak.

The study was conducted online through the Wenjuanxing platform (Online Survey Platform) from 14 to 21 February 2020. In total, 14 505 participants aged at least 18 years provided informed consent to participate. Depression, anxiety, and stress symptoms were assessed using the Chinese version of the Depression, Anxiety, and Stress Scale (the severity of the symptoms was divided into five grades: normal, mild, moderate, severe, and extremely severe).⁴ Participants reported whether they had been in isolation/quarantine during the pandemic. If participants reported that they had been isolated due to COVID-19 infection, suspected COVID-19 infection, close contact with people with suspected/confirmed infection, or arrival/return from a severely affected area, they were assigned to the medically isolated subgroup. Participants who responded that they had quarantined, but who did not meet the criteria for the medically isolated subgroup, were assigned to the self-reported quarantine subgroup. This study was approved by the Ethics Committee of Shenzhen Kangning Hospital.

Of the 14 505 participants, 7.2%, 19.9%, and 72.9% reported medical isolation, self-reported quarantine, and no isolation/quarantine, respectively, in the male sample; and 3.5%, 21.3%, and 75.2% reported medical isolation, self-reported quarantine, and no isolation/quarantine, respectively, in the female sample (Table S1). Of the participants who reported medical isolation, 38.2%, 48.9%, and 30.1% reported severe and above depression, anxiety, and stress, respectively. These rates are higher than those for the self-reported quarantine and the no isolation/quarantine subgroups. Logistic regression further showed that no isolation/quarantine

was protective against mental health problems compared with medical isolation (Table 1). These results suggest that medical isolation may affect mental health, which is in accord with previous studies.^{5,6} Because medical isolation means confirmed/suspected infection, or close contact with those people, or from severely affected areas, such individuals might be understandably upset and worried about their health and prognosis. Many medically isolated people experience fear due to their higher risk of infection,⁷ anxiety concerning insufficient supplies, loneliness and boredom due to decreased communication with others,⁶ and fear or anger about negative news and rumors on the Internet.⁵

The medically isolated subgroup reported severe and above depression rates of 48.7% (isolation periods of ≤1 week), 46.8% (isolation periods of 1–2 weeks), and 22.1% (isolation periods of >2 weeks). The corresponding rates of severe and above anxiety and stress in this subgroup, respectively, were 57.7%, 56.1%, and 35.6%, and 44.9%, 38.0%, and 13.8% (Tables S2–S4). Logistic regression showed that the adjusted odds of severe and above depression (Table S2) and stress (Table S4) were significantly lower among individuals in isolation for >2 weeks (odds ratio = 0.419 and 0.278) versus ≤1 week. Given the long incubation period of COVID-19,⁸ people who had medically isolated for more than 2 weeks reported fewer psychological problems, perhaps because they realized the decreasing likelihood that they were infected. Although these rates significantly decreased with time (especially stress), they remained high after 2 weeks. Longer isolation may be associated with worse psychological outcomes due to chronic stress and negative emotions.⁹

Furthermore, the results suggest significantly higher rates of psychological problems (severe and above depression, anxiety, or stress symptoms) in participants aged 18–29 years (vs ≥30 years), in frontline anti-epidemic workers (vs students and other occupations), in people with a middle school education or lower (vs ≥college-educated), in people who had paid little attention to epidemic information (≤6 times/day vs ≥7 times/day), and in people who felt nervous about having sufficient supplies (vs no nervousness) during medical isolation among the medically isolated group (Tables S2–S4). These findings provide a reference for effective interventions, such as focusing on frontline workers and relatively young and low-educated individuals; ensuring the accuracy of information disseminated; and providing basic living security. Several of these precautions have been recommended by psychiatrists.¹⁰ Interestingly, isolating individuals who received basic supplies from the service department during the outbreak (vs those who did not) reported more severe and above psychological problems among the medically isolated group (Tables S2–S4). This finding may be because the provision of supplies indicates a greater risk of COVID-19 infection, and, as a result, more severe psychological problems.

Table 1. Rates of various symptoms for the different isolation/quarantine status groups and unadjusted logistic regression results

Symptoms (dependent variable)	Isolation/quarantine status	<i>N</i>	<i>n</i> (%; 95%CI)	UOR (95%CI)
Severe and above depression symptoms	No reported isolation/quarantine	10 786	806 (7.5, 7.0–8.0)	Reference
	Self-reported quarantine	3012	244 (8.1, 7.2–9.1)	1.091 (0.940–1.267)
	Medical isolation	707	270 (38.2, 34.7–41.8)	7.650 (6.468–9.048)
Severe and above anxiety symptoms	No reported isolation/quarantine	10 786	1180 (10.9, 10.4–11.5)	Reference
	Self-reported quarantine	3012	381 (12.6, 11.5–13.9)	1.179 (1.042–1.334)
	Medical isolation	707	346 (48.9, 45.3–52.6)	7.802 (6.653–9.150)
Severe and above stress symptoms	No reported isolation/quarantine	10 786	621 (5.8, 5.3–6.2)	Reference
	Self-reported quarantine	3012	189 (6.3, 5.5–7.2)	1.096 (0.926–1.296)
	Medical isolation	707	213 (30.1, 26.9–33.6)	7.058 (5.896–8.449)

CI, confidence interval; UOR, unadjusted odds ratio.

In summary, these findings demonstrate that medically isolated individuals during the COVID-19 outbreak experienced high rates of psychological problems, especially in the early days of isolation. The psychological problems of medically isolating individuals must be addressed.

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Disclosure statement

The authors declare no conflict of interest.

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Supporting information


Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

Table S1. Demographic characteristics of the participants.

Table S2. Prevalence and distribution of severe and above depression symptoms and relevant factors among the medically isolated group.

Table S3. Prevalence and distribution of severe and above anxiety symptoms and relevant factors among the medically isolated group.

Table S4. Prevalence and distribution of severe and above stress symptoms and relevant factors among the medically isolated group.

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Withdrawal from long-term use of caffeinated drinks can cause schizophrenia-like symptoms: A case report

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In recent years, energy drinks containing large amounts of caffeine have become popular among young people, and various health problems caused by caffeine have become a major issue.¹ Caffeine stimulates the central nervous system and has been associated with some risk of dependence.²

We report on a male adolescent who presented with schizophrenia-like symptoms after abruptly ceasing long-term use of energy drinks. A 16-year-old Japanese boy with no history of manic/hypomanic, major depressive, or psychotic episodes reported perceiving 'another self' in his head. He had no history of illegal drug use or family history of psychiatric disorders. Some reports have described caffeine-induced psychotic symptoms,³ but to the best of our knowledge, no report has indicated the occurrence of psychotic symptoms during caffeine withdrawal. This is the first reported case of temporary psychosis-like symptoms during caffeine withdrawal.

At age 14 years, the patient had developed a nightly practice of drawing and would use energy drinks to stay awake after midnight. His intake of energy drinks had gradually increased to 3550 mL per 24 h, equivalent to 1280 mg of caffeine per day. When he was in junior high, he had sometimes had the urge to kill someone, and, to distract himself from this urge, he had resorted to self-harm by injuring his own arm using a ballpoint pen. By age 16 years, his high school homeroom teacher had become concerned that he was drinking energy drinks too often and appearing lethargic during class. He was strongly persuaded to discontinue consuming energy drinks, and he stopped abruptly. For the next several days, he felt intense fatigue and had difficulty in concentrating. Ten days after ceasing energy-drink consumption, he began having thoughts of the 'other self.' This 'other self' ordered him to write down his conversations with it on a piece of paper. Four days later, during a class, he had an urge to kill someone. His body felt like it was being controlled by his 'other self,' and he actually picked up a knife; however, he thought better of it. He was scared and shaking, and consulted his health teacher. Hence, accompanied by a concerned teacher and his mother, he visited a psychiatrist at our hospital.

At the first interview, however, the 'voice' had weakened and the urge to hurt others was gone. He was slightly fatigued during the daytime but no longer craved energy drinks. Brain computed tomography revealed no abnormalities. His score on the Wechsler Adult Intelligence Scale, 3rd edition, was 93, within normal range.

In this case, long-term use of caffeine had been suddenly discontinued, and delusions had developed several days later. We tentatively diagnosed 'caffeine-induced psychotic disorder, with onset during withdrawal,' on the basis of the diagnostic criteria of the DSM-5. He did not take any antipsychotic drugs. The delusions gradually disappeared, and the patient regained a sense of self-control over his thoughts within 1 month. In the more than 2 years since, the symptoms have not recurred. The relationship between caffeine