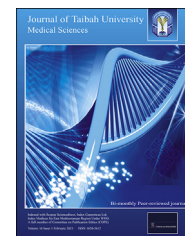




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Letter to the Editor

## Fasting among healthcare workers in the battle of COVID-19: Should we be worried?



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Dear Editors,

It is undebatable that all healthcare workers are still struggling to decrease the increasing rate of coronavirus disease (COVID-19) cases. They play a critical role in providing the best quality care to patients; however, fatigue, burnout, stress, anxiety, depression, and other health symptoms have become issues during the battle. However, healthcare workers never complain for the sake of the health of others. These are the real heroes we have today, and they are to be appreciated.

On 24 April 2020, those who held Islam as their religion were happy for the coming of the feast of Ramadan. It is the holy month when healthy adult Muslims are obligated by God (Allah) to fast or refrain from eating and drinking (including water) every day from dawn to sunset and abstain from smoking and sexual activity during this period, which is explained in the Holy Qur'an Surah Al-Baqarah (2–183). However, specific subgroups, including sick, frail subjects, and pregnant women, among others, are exempted. In addition to Ramadan fasting, most Muslims also perform Sunnah fasting as a complement to the obligatory fasting. There are various Sunnah fasting, such as fasting on Mondays and Thursdays, fasting for Daud, fasting 6 days of Shawwal, etc. The fasting period varies depending on the season and the geographic location, ranging from around 12 h/day to approximately 18 h/day for one month.<sup>1</sup>

Fasting involves dietary and sleep modifications and has significant medical and physiological effects on the body,

particularly on the immune system, which is essential to prevent COVID-19. Fasting increases the white blood cells, red blood cells, platelet count, and high-density lipoprotein cholesterol. Fasting also decreases blood cholesterol, low-density lipoprotein cholesterol, triglycerides, and very low-density lipoprotein cholesterol.<sup>2</sup> Therefore, fasting may become an issue among healthcare workers who choose to fast during their work as well as among their employers who do not expect their employees to experience any unpleasant medical condition. Fasting issues related to the immune system and performance among healthcare workers in the battle of COVID-19 have rarely been investigated. Thus, in this letter, we would like to answer the following questions: What are the effects of fasting on the immune system and performance of healthcare workers? Should we be worried? This is explained in the following description.

First, fasting is related to the immune system. There is a growing body of evidence from meta-analyses, systematic reviews, and original research on the effect of fasting on the regulation of the immune system, but this remains inconclusive. However, most studies reported the benefits of fasting on the immune system; Adawi, Watad, Brown, Aazza, Aazza, Zouhir, Sharif, Ghanayem, Farah, and Mahagna<sup>3</sup> found that fasting only mildly influences the immune system, which will return to normal status shortly afterward. Heydarpour, Darabi, Zamanian, Ahmari Tehran, and Mesdaghi<sup>4</sup> revealed that the immune system is strengthened by fasting owing to a significant increase in the levels of C<sub>3</sub>, C<sub>4</sub>, level, cortisol, and blood sugar. Therefore, there is nothing to worry about the immune system of healthcare workers during fasting. Additionally, healthcare workers may experience the signs of dehydration identified by the increase in haematocrit, haemoglobin, and plasma osmolarity, as attributed to the reduction of fluid intake.<sup>2</sup> However, a study showed no difference in the mineral and total water content between the group who fast and exercise and those who fast without exercise.<sup>5</sup>

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Second, it is related to performance. A systematic review and meta-analysis conducted by Abaïdia, Daab, and Bouzid<sup>6</sup> revealed that the parameters of physical performance were not affected by fasting when tested either in the morning or in the afternoon. It is also found that fasting could improve mood and daytime concentration, alleviate oxidative stress, and enhance cognitive functions.<sup>7</sup> Therefore, the performance of healthcare workers will be at a similar stage of their pre-fasting performance.

In conclusion, fasting is safe for healthy individuals, and it will not become a double burden for healthcare workers. In addition, fasting is advantageous to healthcare workers' health, physiological well-being, and mental health. The advantages include a significant reduction in body weight, body mass index, body fat, waist circumference, blood glucose, basal metabolic rate, systolic and diastolic blood pressure, stress, and anxiety levels.<sup>2</sup> Fasting also decreases inflammation, tumour necrosis factor, pro-inflammatory cytokines IL-1 $\beta$ , IL-6, and cancer promotion. Therefore, we do not need to be worried because there are no adverse events of fasting on health.<sup>2</sup> However, those with various illnesses such as coronary artery disease, diabetes mellitus, eye, and renal should get recommendation from health professionals. Sleep quality and a suitable nutritious diet should be optimized to reduce fatigue in the battle of COVID-19.

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#### Conflict of interest

The authors have no conflict of interest to declare.

#### Ethical approval

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#### Authors' contributions

JG conceptualised and designed the study, analysed and interpreted the data, and wrote the initial and final draft of the article. RT collected and organised that data, checked the final draft of the article, and provided logistic support. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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