

# The Association Between Smartphone Use and Breast Cancer Risk Among Taiwanese Women: A Case–Control Study [Response to Letter]

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Ya-Wen Shih<sup>1</sup>  
Hsiu-Ting Tsai<sup>1,2</sup> 

<sup>1</sup>School of Nursing, College of Nursing, Taipei Medical University, Taipei, Taiwan;  
<sup>2</sup>Post-Baccalaureate Program in Nursing, College of Nursing, Taipei Medical University, Taipei, Taiwan

## Dear editor

We thank Dr SMJ Mortazavi for interest in our recent publication.<sup>1</sup>

Regarding to his first comments on “smartphone blue light filter”. We agree with his opinion in terms of blue light suppressing the secretion of melatonin, which possibly causes circadian rhythm disruption.<sup>2</sup> Though most applications are available in modern smartphones, people are mostly not aware of the dangers of the blue light, hence they usually do not apply the blue light filter for protection, especially in Taiwan and China.<sup>3</sup> That is why we did not consider this factor would affect our result. All participants stand on the same baseline.

The second concern was about the control of environmental light before bedtime. The environmental lights’ exposure intensity and frequency vary from the individual and complicated causal mechanisms in a naturalistic setting. Notably, Lin et al, discovered smartphone use has a mediator effect of circadian rhythm delay with daily and bedtime pre-sleep. They indicated that using a smartphone before bedtime mediated delayed circadian rhythm and reduced the total sleep time.<sup>4</sup> Furthermore, Chang et al also demonstrated that using the light-emitting device before bedtime increased the risk of delayed sleep-phase disorder and sleep-onset insomnia.<sup>5</sup> In addition it was reported that as smartphone light can suppress melatonin production, which is not only a sleep-promoting hormone, but also plays an important role in inhibiting the release of estrogen, resulting in a propensity for breast cancer.<sup>4,5</sup> These illustrated that the light emitted by smartphones could be harmful to human well-being.

Thank you for your contributions and comments. This is a very important health issue, as smartphones become indispensable to life gradually, it already changes in the living styles of human beings. No study has investigated the relationship between smartphone use and breast cancer. This case–control study purposely investigated the relationship between smartphone use and breast cancer risk. However, the findings of this research are that excessive smartphone use significantly increased the risk of breast cancer. Particularly for participants with smartphone addiction, close distance between breasts and smartphones, and the habit of smartphone use before bedtime.

Therefore, we hope these findings may provide a basis for further scientific research and we will consider these confounding factors you mentioned in our future research.

Correspondence: Hsiu-Ting Tsai  
Post-Baccalaureate Program in Nursing,  
College of Nursing, Taipei Medical  
University, No. 250 Wu-Xing Street, Taipei  
11031, Taiwan, Republic of China  
Tel +886-2-2736-1661 ext. 6330  
Fax +886-2-2736-1664  
Email hsiuting@tmu.edu.tw

## Disclosure

The authors report no conflicts of interest in this communication.

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