

# Usage of mobile devices related to sleep among Sri Lankan doctors

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## Abstract

Over-usage and unsafe usage of mobile devices can affect the sleep negatively. This study was conducted among Sri Lankan doctors using an online questionnaire to assess their practices. Evidence from 633 doctors in this study showed, majority of 494 (78%) takes the phone to the bed when going to sleep and 403 (63.7%) used to watch at them at least 10 mins prior to sleep. The usage of effect minimizing options like blue-light filter, low / auto-adjustable brightness and dark theme were used only by 227 (35.9%), 384 (60.7%) and 201 (31.8%) participants, respectively. This highlighted the importance of increasing awareness.

## Introduction

The smart mobile devices have become an integral part. The usage among doctors is common and it has made life easier [1-3]. The adverse effects on sleep are commonly discussed concerning smart device. Studies have noted that the duration of spending with a mobile device and keeping the phone at the head-end is negatively associated with quality sleep [4-5]. However, international data about the medical professionals on this are lacking. This study is designed to assess the practices of smart device usage among Sri Lankan doctors along with measures taken to minimize the effects.

## Methods

This cross-sectional observational study was carried out as an online survey using "Google-Forms" over 6 weeks in late-2021. The link of self-administered questionnaire was distributed among Sri Lankan doctors through direct messages, emails, and social-media groups utilizing the contact details of the authors. It included the

information sheet and the consent. All the doctors who could access by these means were included while excluding the doctors who worked abroad permanent basis. By sharing that only through doctors, we assumed that the forms were filled only by the doctors. However, that is a limitation of the study. Once the questionnaire was submitted by the respondents it reached the datasheet of the primary investigator's account anonymously. Expected calculated sample size was 422 (As there are no previous estimates of doctors with altered sleep patterns pertaining to mobile phone usage in Sri Lanka, in order to capture the maximum sample size, a prevalence of 50% was considered along with 10% non-respondents' rate). Statistical analysis was done calculating the frequencies and chi-square for significances.

## Results

There were 633 participants with female preponderance (n=346, 54.7%). The age ranged from 27-63 years (mean-34-years). Thirty-five (5.5%) were consultants and 277 (43.7%) were either in or had completed post-graduate training. The doctors from many medical fields had participated while internal-medicine and related specialities being the commonest (n=233, 36.8%). The most used smart device used closer to sleep was the smart-phone (n=432, 68.2%) followed by the laptop (n=97, 15.3%) and the tablet (n=85, 13.4%).

When considering the daily usage, 488 (77.1%) had used for <5 hours while 103 (16.4%) and 42 (6.4%) used them for 5-8 hours and more than 8 hours per day respectively (Figure 2). The majority of 494 (78%) used to take the smart device daily to the bed when they go to sleep. The most mentioned reason (multiple) was setting-up alarms (n=429, 67.8%) followed by streaming through

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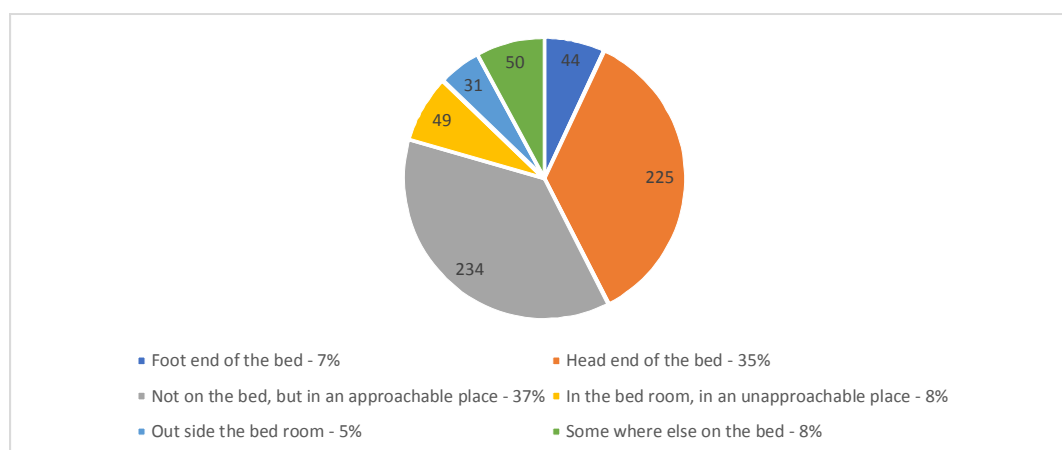


Figure 1. The places that mobile device commonly kept during the sleep.

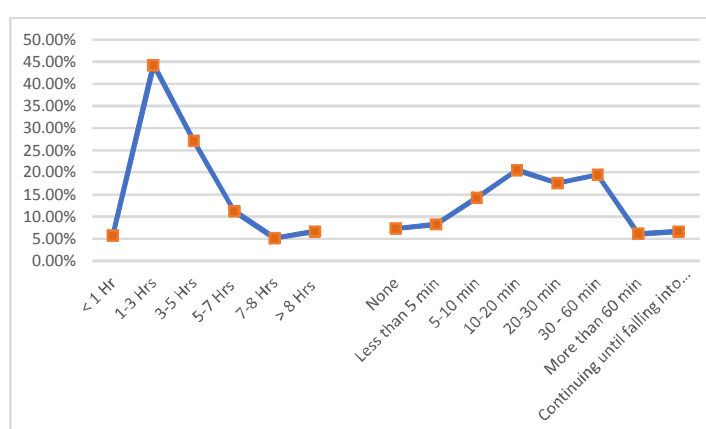


Figure 2. The daily usage and the usage just before the sleep.

social-media ( $n=355$ , 56.1%) and official/on-call purposes ( $n=335$ , 53%). When they take the mobile device to the bed, 225 (35.5%) used to keep them at the head-end of the bed and further results on this variable are illustrated in Figure 1. Furthermore, 223 (35.2%) had mentioned that they charge the phone daily either on the bed or somewhere closer. Majority, 403 (63.7%) mentioned that they watch smart device at least 10 mins just before sleep (Figure 2).

Majority ( $n=471$ , 74.4%) were aware that over-usage of mobile devices can affect the sleep and 135 (21.3%) had already perceived (Their own perception on direct questioning) that their sleep is adversely affected. On further analysis, it was observed that daily usage of mobile device more than 3 hours was significantly associated ( $p=0.04$ ) with the perception of mobile use influencing sleep. However, there was no statistical significance observed with the participants having the perception of mobile use affecting the sleep and taking the mobile device to bed ( $p=0.16$ ) and increased use of device in bed for more than 10 minutes ( $p=0.44$ ). Furthermore, taking the mobile device to bed ( $p=0.46$ ) or using the mobile device

more than 3 hours a day ( $p=0.15$ ) or using the mobile device >10 minutes just before the sleep (0.09) were not significantly associated with the perception of them having poor sleep. Frequencies of utilization of effect minimizing options are illustrated in Table 1.

Table 1. The utility of effect minimizing options

Effect minimizing options	Utilization of the options	Frequencies (%)
<b>Blue light filter</b>	Utilizing the option	227 (35.9%)
	Not utilizing the option	77 (12.2%)
	Unaware about the option	329 (51.9%)
<b>Display brightness</b>	Utilizing the option	384 (60.7%)
	Not utilizing the option	235 (37.1%)
	Unaware about the option	14 (2.1%)
<b>Dark theme</b>	Utilizing the option	201 (31.8%)
	Not utilizing the option	332 (52.4%)
	Unaware about the option	100 (15.8%)

# Discussion

As doctors, the usage of smart devices is a daily routine with finger-tip availability of medical information. Sri Lanka use the paper based medical recording system for majority of clinical work. However, personal smart device usage plays a leading role in their routine.

Biological clock is essential in maintaining healthy sleep-wake cycle. Electronic screens emit short-wavelength enriched light called blue-light [6]. Exposure to this blue-light suppresses the production of melatonin which can adversely affect the sleep leading to insomnia, longer sleep latency, worse sleep efficiency, sleep disturbances and daytime dysfunction [6-8]. Therefore, the “hygienic-use” of smart device is an important strategy in managing sleep related disorders in modern society. Studies done on adolescents and adults have shown the usage of them for more than 3 hours a day, using them before the sleep and keeping the device at the head end during the sleep is known to cause unhealthy sleep with adverse health outcome [8,9]. However, in our cohort that could not be shown in the analysis because we had just asked the perception of the sleep without assessing the quality of the sleep objectively.

In our cohort, 1/4<sup>th</sup> used the mobile device more than 5 hours and majority had taken the mobile phone to the bed daily. Commonest reasons (setting-up the alarm and social media), they should have avoided or used alternatives. Keeping the device at the head-end is not advisable and however, 35% of the participants practiced of keeping them at the head-end. Moreover, even though 60% used an auto-adjustable/low brightness on the screen, the overall awareness of the effect minimizing options were unsatisfactory. Furthermore, the impression is that the doctors are not using the protective behaviour pattern even though the awareness of mobile use leads to poor sleep. This study highlights the importance of enhancing the awareness even in the medical community and the public about this modern world “hygienic-usage” mobile device for a healthy sleep to minimize multiple long-term mental/physical/social health concerns, especially in the younger generation.

# Authors contributions

All authors were involved in the design and conduct of the study. HB drafted the manuscript and analysed data with input from HA, TW, DD and SK. All authors contributed to and approved the final manuscript.

# Competing interests

All the authors declare that no competing interests.

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# Ethics approval

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