

Assessment of mobile screen time, sleep quality, and reaction time in young adults with premenstrual dysphoric disorder



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ABSTRACT

Background: Premenstrual syndrome is observed in the late luteal phase of the menstrual cycle. However, the studies related to the assessment of screen time, sleep quality, and reaction time (RT), in young adults with premenstrual dysphoric disorder are sparse in the Indian scenario. Hence, the present study was undertaken.

Aims and Objectives: The present study was undertaken to observe the assessment of screen time, sleep quality, and RT in young adults with premenstrual dysphoric disorder (PMDD). **Materials and Methods:** A total of 1200 participants were screened and 150 participants were recruited for the study. Willing females within the age group of 18–24 with positive responses to five or more of 11 Diagnostic and Statistical Manual of Mental Disorders-5 criteria were part of the study. A total of 150 willing, age-matched controls were also part of the study. Mobile screen time was recorded using Your Hour app. Sleep quality was assessed using an insomnia severity index questionnaire. Auditory and visual RT (VRT) was recorded using the RT apparatus. **Results:** Significantly higher screen time and significantly higher insomnia scores were observed in the participants with PMDD. Both the auditory and VRT were significantly longer in the PMDD cases when compared with healthy individuals. **Conclusion:** The study results support that longer screen time is associated with PMDD as it affects sleep adversely. Further, the RT is longer in PMDD cases than in healthy controls. Hence, reducing screen time may help as a simple remedy along with the regular management of PMDD.

Key words: Premenstrual dysphoric disorder; Anxiety; Distress; Sleep; Memory; Screen time

INTRODUCTION

Premenstrual syndrome is observed in the late luteal phase of the menstrual cycle. The symptoms include emotional, physical, and behavioral.¹ It was reported that at least 5–8% of females in the reproductive age experience some form of premenstrual syndrome. A severe form of premenstrual syndrome is called premenstrual dysphoric disorder (PMDD).² To diagnose PMDD one must

present symptoms such as depression, irritability, and anger which are negative psychological emotions. The symptoms of the disorder were reported to begin in the early reproductive age in females and the exact cause for the disorder is yet to be known. Eating behavior, high levels of stress, lifestyle changes, hormonal changes, and maybe neurotransmitters were linked with PMDD.^{3,4} As there is an increased availability of the Internet, and at the same time there is no control over the usage, young

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adults spend maximum time on the screen. This excess screen time has a negative impact on sleep duration as well as sleep quality.⁵ Sleep is directly linked with PMDD as it was reported that females with PMDD response to melatonin decrease, especially in the luteal phase.⁶ Further, females with PMDD also experience declined cognitive functions such as less attention and memory problems.⁷ Eating behavior is also reported to be associated with PMDD.⁸ All these factors together decline the quality of life of the individual. However, the studies related to the assessment of screen time, sleep quality, reaction time (RT), and quality of life in young adults with PMDD are sparse in the Indian scenario. Hence, the present study was undertaken.

Aim and objectives

The present study was undertaken to observe the screen time, sleep quality, and RT in young adults with PMDD.

MATERIALS AND METHODS

The present study was a cross-sectional study conducted from February 2024 to December 2024. The study protocol was approved by the institutional human ethics committee (IHEC-12-3-11). A total of 1200 participants were screened and 150 participants were recruited for the study. Willing females within the age group of 18–24 with positive responses to five or more of 11 Diagnostic and Statistical Manual of Mental Disorders-5 criteria were part of the study. A Total of 150 willing, age-matched controls were also part of the study.⁹ Participants under any type of medical treatment or adjunctive therapy were excluded from the study. After recruitment, the participants underwent a physical examination by a general physician. Soon after the physical examination, demographic data of the participants was recorded from both the cases and controls. Following the demographic data, the screen time of mobile phones over the past month was assessed and the average screen time per day was calculated. Mobile screen time was recorded using the Your Hour app installed on the mobile phones. Sleep quality was evaluated using an insomnia severity index questionnaire.¹⁰ Auditory and visual RT (VRT) was recorded using an RT apparatus manufactured by Anand agencies, Pune. Before recording the RT, the participants were trained on the instrument. After proper training, the RT for visual stimulus (red light and green light) and auditory stimulus (low pitch and high pitch sound) were recorded. Three readings were recorded and the best reading was considered and recorded. RT was recorded in both right and left-hand responses. All the data collection was performed at the convenient time of the participants.

Statistical analysis

Data were analyzed using the SPSS 21.0 version. Student's t-tests were applied to observe the significance of the difference in the parameters between the groups. A probability value of <0.05 was considered significant.

RESULTS

Significantly higher screen time and significantly higher insomnia scores were observed in the participants with PMDD. Both the auditory and VRT were significantly longer in the PMDD cases when compared with healthy individuals (Table 1-3).

DISCUSSION

Menstrual disorders are known to affect overall health and decrease the quality of life. The studies on PMDD are sparse. The symptoms of PMDD are seen during the premenstrual phase of the monthly cycle. Disturbed emotional regulation was reported in the PMDD.¹¹ The prevalence of premenstrual disorders was reported to have a rising tendency in the past 10 years.¹² Electronic media influence is increasing day by day in the current lifestyle. It was reported that young adults spend around 7 h on screen. Hence, reducing screen time may help as a simple remedy along with the regular management of PMDD.² It was reported that excess screen time adversely affects mental health, and sleep quality and decreases the academic performance of students.^{13,14} Menstrual disorders such as irregular cycles, excessive bleeding, and premenstrual syndrome were significantly associated with lack of adequate sleep in young adults.^{7,15} Further, interestingly, it was reported that females with PMDD experience insomnia very commonly.⁷ Another study reported that the scores of the Pittsburgh Sleep Quality Index were above 5 in university students with PMDD.¹⁶ Hence, sleep disturbances are reported to be a contributing factor for menstrual disorders.¹⁷ In the present study, there was longer screen time and declined sleep quality in the PMDD cases than healthy controls. It is understood that excess screen time reduces sleep duration as well as sleep quality and in turn sleep disturbances adversely affect the menstrual cycle. Hence, as a prevention of menstrual disorders, one of the lifestyle changes can be

Table 1: Demographic data of the participants

Parameter	Cases (n=150)	Controls (n=150)	P-value
Age (years)	20.55±1.63	20.64±2.34	0.9168
Height (cm)	169.83±4.39	162±8.91	0.0122*
Weight (kg)	49.75±6.98	46.92±5.43	0.2793

Data were expressed as mean and SD. (P<0.05 is significant)

Table 2: Screen time, sleep quality, and visual reaction time of the participants

Parameter	Cases (n=150)	Controls (n=150)	P-value
Screen time (hours)	6.23±1.3	4.11±1.07	<0.0001***
ISI score	17.77±2.52	14.55±2.0	0.006**
VRT green right response	0.3662±0.03	0.3209±0.02	0.003**
VRT green left response	0.403±0.02	0.375±0.02	0.103
VRT red right response	0.347±0.01	0.301±0.01	0.005**
VRT red left response	0.415±0.02	0.301±0.01	0.0001**

Data were presented as mean and SD. (**P<0.01 is significant), ISI: Insomnia severity index, VRT: Visual reaction time

Table 3: Auditory reaction time of the participants

Parameter	Cases (n=150)	Controls (n=150)	P-value
ART high-pitch right response	0.286±0.01	0.235±0.04	0.01*
ART high pitch left response	0.302±0.01	0.243±0.04	0.006**
ART low pitch right response	0.342±0.03	0.262±0.03	0.0004***
ART low-pitch left response	0.358±0.03	0.271±0.02	0.0001***

Data were presented as mean and SD. (*P<0.05 is significant, **P<0.01 is significant, ***P<0.001 is significant)

reducing screen time and improving sleep quality. A study reported no significant change in cognitive functioning in PMDD cases.¹⁸ Declined visuospatial ability was reported in females with PMDD.¹⁹ Mood disorders and changes in appetite were also reported in females with PMDD.²⁰ In the present study, both the auditory and VRT were longer in the females with PMDD. The study results support that longer screen time is associated with PMDD as it affects sleep adversely. Further, the RT is longer in PMDD cases than in healthy controls.

Limitations of the study

Different menstrual phase-wise data were not collected in the study.

CONCLUSION

The study results support that longer screen time is associated with PMDD as it affects sleep adversely. Further, the RT is longer in PMDD cases than in healthy controls.

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VM, DK, VR- Design of the study, review of literature, analysis, and preparing the manuscript; **YGR-** Data collection, preparing the manuscript; **SSKG, SGK, AL-** Analysis and preparing the manuscript.

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