Prolonged Internet use and its Impact on Daytime Work Efficiency among School Teachers

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Abstract

Background: Internet addiction is prevalent among all professionals' groups and has many societal and health issues in prolonged internet users. But the research on the status of Internet addiction and its effect on feeling daytime sleepiness among school teachers are scanty which formed the basis of the study. **Methods:**A cross sectional study was conducted using Internet Addiction Scale (IAT) test and Epworth Sleepiness Scale (ESS) as instruments to assess internet addiction and its influence on daytime sleepiness among school teachers. The data was collected through online and analyzed for the statistical significance using software. **Results:**Out of 496 respondents, 42.74 and 57.26 per cent were females and males. About 52.82, 37.90 and 9.28 percent were 25-40, 41-50 and >50years age group respectively. The IAT score showed 45.97 per cent used internet normally. There were 34.88, 15.52 and 3.62 percent had mild, moderate and severe dependence upon internet respectively. However, no significant association was observed between demographic variables, age groups and internet addiction. The results of the ESS score revealed that 46.77 per cent respondents were unlikely to get daytime sleepiness while the remaining 42.34 per cent expressed the feeling of daytime sleepiness. About 10.89 per cent of respondents had higher ESS score (16 to 24) who needs to consider medical attention. A significant ($p<0.001$) positive association was found between males and females, and age groups with ESS scale score. All respondents in the study used internet more than two hours daily for purpose and spending leisure time. However, the duration of internet use by the both gender and age groups did not vary which showed that no difference in using internet for purpose and leisure time. **Conclusion:**It is concluded that presence of internet addiction and feeling daytime sleepiness is revealed among school teachers in the current study.

Key words: Internet addiction; daytime feeling sleepiness; school teachers

Introduction

The primary role of school teachers is to provide quality education and content delivery to young people to mold them as responsible and socially acceptable individuals.Nowadays, to impart better pedagogical techniques, digital media and internet have become a modern inevitable teaching tool and teachers have started utilizing it (Lockton & Ferguson, 2019).

During covid-19 period, 50 per cent of teachers have used smartphones and internet technology for more than four hours and even higher in certain conditions (Klapprothet. al. 2020). Continuous use of internet and its content leads to addicted state (Iwaibara et al. 2019) and causes various behavioral and health issues. Prolonged Internet Use (PIU) changes health, brain functioning and its chemistry (Cheng and Lee 2024).

The PIU has been categorized as spectrum of disorder and numerous studies have linked this internet prolonged use to stress, poor work performance and anxiety(Prakash, 2017; David Bickham, 2021; Kumar et al, 2023; Tadpatrikar, 2024).

Research reports publishedfrom different geographical regions of the world reveals that prevalence of internet addiction (IA) or PIU in medical professionals, medical students (Kumar et al. 2023), university students (Sahu et al. 2024), engineering students (Anand et al., 2019 a) school students and otheroccupational communities. In addition, PIU was also observed in health workers, social workers, nurses etc. Internet addicts preferred night as time of choice for prolonged internet use (Tenzin et al.,2019).He SQ and Chen IH (2024) found prevalence of internet addiction among school teachers and they suggested measures to solve it for better teaching using internet. Ppresence of internet addiction among high school teachers in Hungary was also reported (Toth et al., 2020).

Sleepiness during daytime in workplace is an important impairment for all employees. Choi et al. (2009) found a strong association between internet addicted adolescents with excessive daytime sleepiness. Excessive sleepiness would have less work turn out (Singh et al., 2019). Ling Huang (2023) observed disturbed sleep and depression in those junior college students addicted to internet. Similarly, in a study involving medical students found poor sleep quality among internet addicted students (Mohamed et al., 2024). However, there is a scanty information available about the PIU or IA in teachers who teach students at school level in India.On searching the information from published and online resources, no direct studies could be traced in India about internet addiction among school teachers. Moreover, teachers are pillars of educational activities, any changes in teachers routine would drastically affect students' excellence and performance Keeping the paucity of information in mind, the present study was designed to find out PIU in school teachers and its influence on daytime sleepiness among school teachers.

Materials and Methods

The present study was performed by sending the relevant questionnaire to the participants through google form to different groups of professional (degree and PG degree holders) school teachers. The google form was forwarded through group admin after explaining them about the significance of the data collection and also assured them about the confidentiality maintenance and will not be used for any other purpose other than research. The study area covered (Namakkal, Salem, Erode and Coimbatore districts ofTamil Nadu, India) were part of four important districts where more popular government as well as private schools are located. Survey instrumentsvizInternet Addiction Test (IAT) scale and Epworth Sleepiness Scale (ESS) were forwarded online to nearly 700 teachers after informing them about the study. This study was given approval by the Human Ethics Committee of the Government Medical College, Namakkal, Tamil Nadu India (No.3088/ME2 (IHEC) 2023-24 dt. 27/09/2023). The questionnaire comprised about demographic details plusfew questions about the duration of internet use daily. The information was collected from February 2024 to May 2024, as sufficient time was required to contact the participants and many times we observed reluctance from teachers to answer the google form. Our aim was to get 400 respondents for our study and we presumed that there are about 2000 teachers in the proposed study.

The collected data was analyzed and presented as frequencies and percentage by running descriptive statistics for categorical data and inferential analysis was done using SPSS software (IBM SPSS Statistics, 29).

Results

Table 1. Demographic characteristics of respondents of internet users

Variables	**Frequency** (N=496)	**Percentage**
Gender		
Female	212	42.74
Male	284	57.26
Age (years)		
25 - 40	262	52.82
41 - 50	188	37.90
> 50	46	9.28

The variables gender and age groups show that more number of males and younger age groups have responded to the questionnaire compared to females and age group of more than 40 years old.At the same time, >50 years old group contributed only 9.28 per cent data of the study. This finding clearly shows that young age groups are active in using internet compared to other higher groups. which could be attributed to their capabilities of maneuvering on smartphones.

Table 2. Internet Addiction Test scale score of the respondents

IAT score range	Interpretation	Frequency	Percentage
0 to 30 points	normal level of Internet usage	228	45.97
31 to 49 points	mild level of Internet addiction	173	34.88
50 to 79 points	Moderate level of Internet addiction	77	15.52
80 to 100 points	severe dependence upon the Internet	18	3.63
	Total	496	100

On analysis of IAT scale score (Table 2), it was observed that only 3.63 per cent of the respondents had severe dependence on the internet while 15% had moderate level of internet addiction. A sizable population (46%) used internet normally. Another large number of respondents had mild level of addiction (35%). Nevertheless, this data gives an estimate that PIU is prevalent among school teachers in the selected study area. When compared with normal users, there is more than half of the respondents are prolonged internet users who needs remedies and immediate attention.

Table 3. Association of demographic variables with internet addicted score (N=496)

Variables	Normal level of Internet usage	Mild level of Internet addiction	Moderate level of Internet addiction	Severe dependence upon the Internet	Total	P value (Chi-square test)
Gender						
Female	112 (52.83)	65 (30.66)	28 (13.21)	7 (3.30)	212 (100.0)	0.070
Male	116 (40.85)	108 (38.03)	49 (17.25)	11 (3.87)	284 (100.0)	
Total	228	173	77	18	496	
Age (years)						
25 - 40	108 (41.22)	98 (37.40)	46 (17.56)	10 (3.82)	262 (100.00)	0.029
41 - 50	88 (46.81)	64 (34.04)	28 (14.89)	8 (4.26)	188 (100.00)	
>50	32 (69.57)	11 (23.91)	3 (6.52)	0 (0.00)	46 (100.00)	
Total	228	173	77	18	496	
Numbers in parenthesis are percentage						

There were no association recorded between demographic variables (gender and age groups) and IAT scale score. It was not significant between males and females with different state of addiction levels though there were more males in the study. This observation reveals no variation between gender and age groups with respect to internet use or getting addiction.

However, although no significant difference was seen between age groups for internet addiction, the age groups up to 40 years had higher percentage of addiction (65%) compared to the age group >50 years indicating that youngsters develop habit of going after the internet in their routine. On the other hand, the >50 years' group has less dependence upon internet addiction and no severe dependence.

Table 4. The Epworth Sleepiness Scale score of the respondents

ESS score range	**Interpretation**	**Frequency**	**Percentage**
0 to 7	Unlikely that you are abnormally sleepy	232	46.77
8 to 9	Average amount of daytime sleepiness	121	24.40
10 to 15	Excessively sleepy depending on the situation. May want to consider seeking medical attention	89	17.94
16 to 24	Excessively sleepy and should consider seeking medical attention.	54	10.89
	Total	496	100.0

The observation of ESS score of 10.89 per cent (Table 4) expressed excessively sleepy during daytime is a significant finding of the current studywhich may be due to less sleep hours in the previous nights as evident in the IAT score of 3.63 per cent got severe dependence on internet. Similar to IAT score, ESSscore also exhibits 52 per cent of the respondents feels sleepiness during daytime with different level of feeling sleepiness which may hinder their regular day activities.

Table 5. Association of demographic variables and subjective measure of sleepiness using Epworth Sleepiness Scale score (N=496)

Variables	ESS score				Total	P value (Chi-square test)
	0-7	8-9	10-15	16-24		
Gender						
Female	80 (37.74)	64 (30.19)	44 (20.75)	24 (11.32)	212 (100.0)	0.004
Male	152 (53.52)	57 (20.07)	45 (15.85)	30 (10.56)	284 (100.0)	
	232	121	89	54	496	
Age (years)						
25 - 40	105 (40.08)	62 (23.66)	59 (22.52)	36 (13.74)	262 (100.0)	0.002
41 - 50	97 (51.60)	53 (28.19)	23 (12.23)	15 (7.98)	188 (100.0)	
>50	30 (65.22)	6 (13.04)	7 (15.22)	3 (6.52)	46 (100.0)	
	232	121	89	54	496	
Numbers in parenthesis are percentage						

The result of the association between females and males for ESS score (Table 5) was significant and there were more female respondents who had higher scores and feeling more sleepiness compared to males. Similarly, a significant difference could be found between different age groups for ESS score.The result of ESS score more than 10 points in all the age groups were 46.26,20.23 and 22.75 per cent.Again the group >50 years'had more score (22.74%) than 41-50 years' group indicating that excessive sleepiness in that group may be due toage factors and presence of mild and moderate internet dependence,

Table 6. Duration, purpose and leisure time spending by the internet users in a day

Internet use practices	Frequency (N=496)	Percentage
Daily internet use for actual and necessary purpose (hours)		
< 1 hour	151	30.44
1 - 2 hours	245	49.40
3 - 4 hours	75	15.12
> 4 hours	25	5.04
Total	496	100.00

Daily internet use online for spending free time / leisure time / time pass (hours)		
< 1 hour	230	46.37
1 - 2 hours	170	34.27
3 - 4 hours	87	17.54
> 4 hours	9	1.81
Total	496	100

The answer to the unstructured questions on duration (Table 6) of internet use for purposeful use, majority of the participants utilised 1 to 2 hours daily (80%) and only 20% have used 3 to 4 hours which indicates that the participants judiciously used the internet. On the contrary, for the question of leisure time spending with the internet, 80% respondents have used 1 to 2 hours daily which is similar to the use of internet for actual purpose. Another interesting point noticed from the Table 7&8 that the percentage of males and females using internet nearly at same level. For both the questions, the responses did not significantly vary either between gender or different age groups. From this observation, it is presumed that the participants are using internet for more than 2-3 hours daily for different purposes.

Table 7.
Association of internet daily usage for actual and necessary purpose with age and gender

Variables		**< 1 h**	**1 - 2 h**	**3 - 4 h**	**> 4 h**	**Total respondent**	**P value (Chi-square test)**
Age (years)	25 - 40	91 (34.73)	120 (45.80)	35 (13.36)	16 (6.11)	262	0.065
	41 - 50	47 (25.00)	105 (55.85)	28 (14.89)	8 (4.26)	188	
	> 50	13 (28.26)	20 (43.48)	12 (26.09)	1 (2.17)	46	
	Total	151	245	75	25	496	
Gender	Male	87 (30.63)	135 (47.54)	46 (16.20)	16 (5.63)	284	0.694
	Female	64 (30.19)	110 (51.89)	29 (13.68)	9 (4.25)	212	

Variables		< 1 h	1 - 2 h	3 - 4 h	> 4 h	Total respondent	P value (Chi-square test)
Age (years)	25 - 40	91 (34.73)	120 (45.80)	35 (13.36)	16 (6.11)	262	0.065
	41 - 50	47 (25.00)	105 (55.85)	28 (14.89)	8 (4.26)	188	
	Total	151	245	75	25	496	
Numbers in parenthesis are percentage							

Table 8

Comparison of the relationship between age and gender with the amount of time spent online for leisure activities or time passing

Variables		< 1 h	1 - 2 h	3 - 4 h	> 4 h	Total	P value (Chi-square test)
Age (years)	25 - 40	105 (40.08)	87 (33.21)	65 (24.81)	5 (1.91)	262	0.001
	41 - 50	95 (50.53)	70 (37.23)	19 (10.11)	4 (2.13)	188	
	> 50	30 (65.22	13 (28.26)	3 (6.52)	0 (0.00)	46	
	Total	230	170	87	9	496	
Gender	Male	118 (41.55)	100 (35.21)	58 (20.42)	8 (2.82)	284	0.015
	Female	112 (52.83)	70 (33.02)	29 (13.68)	1 (0.47)	212	
	Total	230	170	87	9	496	
Numbers in parenthesis are percentage							

Discussion

Demographic characteristics

In the present study the response from male teachers was higher by about 15% than female teachers. The younger age group formed higher percentage (52.8%) than other age groups This finding clearly shows that young age groups are active in using

internet compared to other higher groups. which could be attributed to their capabilities of maneuvering on smartphones. It was observed that the association between IA and gender was not significant in our study is different from the observation of IA recorded at higher percentage in males (Anand et al., 2018b).

The young age group participants were prolonged internet users as observed in the current study compared to older people concurs withpreviousfindings of Kumar et al. (2023) who found the age group below 30 years have higher addiction risk andyoung age groups are addicted to internet much easily compared to elders (Holdas, 2017) and those teachers who have access to smartphone with internet and purposeless use of it would end in internet addiction (Fukuda et al.,2023).

Internet addiction

From our results, 54.1% of respondents addicted to internet agrees with the findings of Mariavinifa et al. (2021) who recordedIAof 61.2 % in various group of professionals, and Kumar et al. (2023) observed IA of53.6% in working medicalprofessionals.No difference between male and females observed for IA in our study concurs with Holdas (2017) butdiffers with the report of more males (Anand et al., 2018; Hassan et al., 2020)addict to internet than females. The higher percentage of IA in our study is nearly similar to the report of 0-47 per cent IA prevalence in all Asian countries (Balhara et al., 2018). Recent studies have also observed internet surfing and getting addicted to it is on the rise. According to a meta-analysis in Asian countries, the IA prevalence was 20% in the year 2020 (Chia et al., 2020) and it was 6% (worldwide pooled prevalence) during the year 2014 (Cheng and Li., 2014).

In the present study, where the young age group (25-40 years) are experiencing the severe internet dependence compared to other groups but at the same time all age groups show significant dependence on the internet. This observation reflects the report of internet dependency is related to duration of the time spent (Kumar et al., 2023). However, no association existed between males and females for addiction and both are addicted. This observation in the present study agrees with recent report of more IA in young adults (Nowak et al., 2022).Again, internet dependence has been correlated to functional connectivity changes in brain in individuals which leads to behavioral and development changes (Chang and Lee.,2024)

From our study it can be inferred that 70% of theteachers are using the internet more than one hourfor actual purpose and 54% of the participants are using more than one hour for spending leisure time. In total they are using internet on an average for more than 2 hours daily. This observation is in agreement with He and Chen (2024) who reported the prevalence of the internet addiction among teachers.Similarly, Iwaibara et al., (2019) found a relationship between internet addiction and burnout among school teachers and suggested teachers to restrict the use of internet for more hours. In few earlier studies, it is reported that adolescents who spent >3 hours per day on internet increases the possibility of addiction (Holdas, 2017). On the other hand, Mohammed et al. (2024) observed individuals who are

spending six or more hours would likely get addicted to internet. This might have been the reason for the higher score in ESS for 54.03% of the respondents.

Daytime sleepiness

The positive association of demographic variables with ESS score in our study strongly suggest that feeling daytime sleepiness is related to duration of internet use. Further a significant association was found between males and females. However, no association was recorded between gender for leisure time spending on internet. These findings of our study is similar to Semenova et al. (2021) who found a significant positive association between internet addiction and excessive daytime sleepiness in adolescents. In another study, a significant positive relationship was identified between IA and ESS (Nowak et al., 2022). Further, Singh et al., (2019)observed feeling of sleepiness during the daytime for those who maintain poor sleep hygiene which may result in compromise work quality. Excessive daytime sleepiness was positively correlated to the IAT score (Sathe et al., 2021). Mahmoud et al. (2024) found a strong relationship of IA and sleep quality disturbance in 81% of the medical students participated in the study and found a strong association between internet addiction, depression and sleep disturbances.

Conclusion

It could be inferred from the present study.IA is on the rise in teaching community at school level which has to be modified to suit the modern technology for finding solutions to the learners' difficulties.In addition,feeling of daytime sleepiness are prevalent among teachers where steady workflow is needed in a whole day and both the gender equally addicted to internet which warrants immediate remedial actions.

Limitations

The current study has limitations. The data generated may not represent entire state as we focused only important vibrant four districts of Tamil Nadu. Due to paucity of information on internet addiction among teachers, a detailed comparison could not be made with earlier studies.

Conflict of interest

The authors declare that there are no conflict of interest in this research

References

1. Anand N, Jain PA, Prabhu S, Thomas C, Bhat A, Prathyusha PV, Bhat SU, Young K, Cherian AV (2018a). Internet use patterns, Internet addiction, and psychological distress among engineering university students: A study from India. Indian J Psychological Medicine, Sep-Oct;40(5):458-467.
2. Anand N, Thomas C, Jain PA, Bhat A, Thomas C, Prathyusha PV, Aiyappa S, Bhat S, Young K, Cherian AV (2018b). Internet use behaviours, internet addiction and psychological distress among medical college students: A multi-centre study from South India. Asian Journal of Psychiatry.37:71-77.
3. Balhara YPS, Mahapatra A, Sharma P, Bhargava R (2018). Problematic internet use among students in South-East Asia: current state of evidence. Indian Journal Public Health. 62:197–210.
4. Chang MLY, Lee IO (2024) Functional connectivity changes in the brain of adolescents with internet addiction: A systematic literature review of imaging studies. PLOS Ment Health 1(1): e0000022.
5. Cheng C, Li AY.(2014). Internet addiction prevalence and quality, of (real) life: a meta-analysis of 31 nations across seven world regions. Cyberpsychological Behaviour Society Network,17(12):755–760.
6. Chia DXY, Ng CWL, Kandasami G (2020). Prevalence of internet addiction and gaming disorders in southeast Asia: a meta-analysis. InternationalJournal Environment Research Public Health.;17(7):2582.
7. David S. Bickham. (2021)Current Research and Viewpoints on Internet Addiction in Adolescents. International Journal Community Medicine Public Health, 8(9):4525-4530
8. KumarKrishan, KapilGoel and AseemMehra (2023). Internet addiction and Its association with demographic variables, depression, anxiety, and psychological well-being in college students. Annals of Neurosciences 1–7.
9. Nowak M, K.Rachubinska, M. Starczewska, E. Grochans.(2022). Seeking relationships between Internet addiction and depressiveness, daytime sleepiness, as well as perceived social support in young adults. European Review for Medical and Pharmacological Sciences, 26: 1374-1381
10. Mariavinifa X., Govindarajan P. K., John William A. Felix (2021). Prevalence and associated factors of internet addiction among college students using smartphone in Tamil Nadu: a cross-sectional study. International Journal of Community Medicine and Public Health, 8(9):4525-4530
11. Semenova N, Tereshchenko S, L LE, Zaytseva O, Shubina M (2021). Internet addiction and excessive daytime sleepiness in adolescents. European Psychiatry. 13;64(Suppl 1): S579.
12. Singh LK, Suchandra KHH, Pattajoshi A, Mamidipalli SS, Kamal H, Singh S, Sachacher B, Mehta V. (2019).Internet addiction and daytime sleepiness among professionals in India: A web-based survey. Indian J Psychiatry.61(3):265-269.

13. Tadpatrikar A, Sharma MK, Amudhan S and Desai G. (2024).Theprevalence and correlates of internet addiction in India as assessed by Young's Internet Addiction Test: A systematic review and meta-analysis. Indian Journal of Psychological Medicine; XX:1–10.
14. Holdoš J.(2017). Type D personality in the prediction of internet addiction in the young adult population of Slovak Internet users. Current Psychology, 36 (4) pp. 861-868,
15. Hassan T, M.M. Alam, A. Wahab, M.D. Hawlader. (2020). Prevalence and associated factors of internet addiction among young adults in Bangladesh. Journal of the Egyptian Public Health Association, 95 (1), p. 3.
16. Prakash S. (2017). Internet addiction among junior doctors: A cross-sectional study. Indian Journal of PsychologicalMedicine, 39:422-5.
17. Sathe, HarshalShriramSaraf, AnantprakashSiddharthkumarTalapalliwar, Manoj Patil, Vrushti Kumar, Vinay Karia, Sagar. (2021). Excessive daytime sleepiness and sleep quality in medical students and their association with smartphone and internet addiction: A cross-sectional study. Annals of Indian Psychiatry, 5(2): p 139-143
18. Mohammad, M.A, Alyami, M.H.F and Awed, H.S. (2024). The association between internet addiction and sleep quality among medical students in Saudi Arabia. Annals of Medicine, 56 (1), 2307502.
19. Mahmoud, OSA, Hadad, S, Abdelraheem,T.(2022). The association between Internet addiction and sleep quality among Sohag University medical students. Middle East Current Psychiatry, 29: 23.
20. He SQ, Chen IH. (2024). Internet addiction among teachers: A systematic review. Environment and Social Psychology, 9(6): 2513.
21. Ling-Huang, Chieh-Yu-Liu, Min-Huey Chung. (2023). Sleep quality and internet addiction among junior college students; the mediating role of depression: A cross sectional study. Archives of Psychiatric Nursing, 6: 1-7.
22. Lockton, M. and Fargason, S. (2019). Disrupting the status quo: How teachers grapple with reforms that compete with long-standing educational views. Journal of Educational Change, 20(4), 469–494.
23. Iwaibara A, Fukuda M, Tsumura H. (2019). At-risk Internet addiction and related factors among junior high school teachers—based on a nationwide cross-sectional study in Japan. Environmental health and preventive medicine; 24: 1-8.
24. Fukuda M, Chowdhury M, Chowdhury T (2023). At-risk internet addiction and related factors among senior high school teachers in Japan based on a Nationwide survey. NeuropsychopharmacologyReports, 43(4): 553-560.
25. Chang MLY, Lee IO (2024) Functional connectivity changes in the brain of adolescents with internet addiction: A systematic literature review of imaging studies. PLOS Ment Health 1(1): e0000022.

26. Klapproth F, Federkeil L, Heinschke F, (2020). Teachers' experiences of stress and their coping strategies during COVID-19 induced distance teaching. Journal of Pedagogical Research; 4(4): 444-452.
27. Sahu RK, Rajput DS, Jadeja N, Shukla A, DwivediRR.(2024). Internet addiction and its impact among higher educational students from 10 universities in the Indian state of Chhattisgarh. Addict Health.16(2):107–114.
28. Tenzin K., Dorji T., Choeda T., Wangdi P., Oo M. M., Tripathy J. P., Tenzin T., Tobgay T. (2019). Internet addiction among secondary school adolescents: A mixed methods study. Journal of the Nepal Medical Association, 57(219), 344–351.
29. Tóth, G. Kapus, K. Hesszenberger, D. Pohl, M. Kósa, G. Kiss, J. Pusch, G. Fejes, É. Tibold, A. Feher, G. (2021). Prevalence and risk factors of internet addiction among Hungarian high school teachers. Life, 11: 194.
30. Choi K, Son H, Park M, Han J, Kim K, Lee B, Gwak H. (2009). Internet overuse and excessive daytime sleepiness in adolescents. Psychiatry Clinical Neurosciences. 63(4):455-62.