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A Study on the Influences of Digital Media on Changes in Sleep Patterns during Covid-19 Pandemic among Adolescents in Bengaluru

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ABSTRACT

The aim of this paper was to examine the digital media's influences on changes in sleep patterns during the Covid-19 pandemic To Determine the Causes of changes in sleep patterns and sleep disturbances. Snowball sampling was adopted. An online survey was circulated. A total of 118 samples were collected using a Google Form. The collected data was converted using SPSS software, and the necessary statistics were extracted for data analysis and interpretation. Data were processed by descriptive analysis and t-test.

More favourable results were obtained in favour of bedtimes before and after Covid Statistically, significant differences were found for the variables sleep hours and wake-up time, and usage of Instagram. The usage of digital media has resulted in changes in sleep patterns. Social networking site usage increased from 39 % before the covid to 50 % (59 of the respondents) during the covid, representing half of the study population.

Keywords: Sleep patterns, Covid-19 pandemic, Digital media influences, Sleep disturbances

INTRODUCTION.

As a result, children had no choice but to be occupied at home with their mobile phones, televisions, and other electronic gadgets, which caused significant changes in their behaviour These changes in sleep patterns have caused a variety of disruptions in their day-to-day lives, including their interaction with their parents, friends, and neighbours, as well as their attendance and concentration in their online classes. Their socialization patterns have also been affected by the switch in sleep patterns. These issues can also lead to psychological issues. This study shows that it can have a significant negative impact on health and well-being, the nature and extent of which are determined by the mental health of young minds. As a result, the goal of this systematic review and analysis is to determine the current impact of the COVID-19 outbreak on adolescents' sleep disturbance and sleep patterns.

As we all know, Bangalore is one of the smart cities where children are exposed to various social media platforms at a very young age, whether through families, peers, or even digital influence. The influence of digital media on sleep patterns among adolescents is the focus of this study. Adolescents are accustomed to various social media platforms such as Instagram, Facebook, YouTube, and WhatsApp,

and some are even addicted to them. They are also well-versed in various OTT platforms and have a penchant for watching web series.

The increased use of digital media, particularly before bedtime, has resulted in a variety of changes in adolescents' sleeping patterns., the ion sleep-wake patterns and sleep disturbances have become an important field of study for adolescents. Adolescent sleeping patterns have changed as a result of increased use of digital media, particularly before bedtime.

Difficulties falling asleep, Nightmares, Daytime Sleepiness, Concentration in class, and Irritated daytime Awakenings in the middle of the night, have increased and have become a common pattern among adolescents during the covid period.

As a result, social media use may be an important factor interfering with a regular sleep schedule. Understanding the effect of Covid-19 on adolescent sleep and identifying the factors that promote unhealthy changes is a high-priority research topic. There has been no previous research on this topic, particularly among adolescents in Bangalore.

Therefore -The objectives of the study are: To Determine the Causes of changes in sleep patterns and sleep disturbances among adolescents. To examine the level of influence Digital media has on the changes in sleep patterns. To portray accurately the comparison between the changes in sleep patterns before Covid-19 and Now during the pandemic. To identify the co-relationship between Sleep disturbances and Digital media influence

REVIEW OF LITERATURE

In the modern environment, social networking tools are utilized by all age groups for a variety of reasons, notably knowledge advancement, enhanced creativity in diverse industries, and networking, but it is also extensively used among adolescents for recreation (Sana Ali, 2018, p. 2). This social media engagement has been reported to alter not just by age but by gender as well. In a study conducted in Taiwan, direct elevated academic effects of social media usage were observed in the female group, whereas negative areas of participation besides academically beneficial domains were observed largely within the male group (Tsai CC, Lin SS, 2001).

A study of adolescents' social media engagement types – intense usage group and problematic usage group – found that both types had decreased physical and mental wellbeing, however, the problematic user type had amplified negative implications on health and behaviour relating to social support, psychological problems, and unsatisfactory academic experience. This investigation also reveals a clear correlation between prolonged screen addiction in 29 countries with internet bandwidth, affordability, and performance marking the youth population mainly within developing and developed countries as the most vulnerable group. (M. Boer et al., 2020).

According to a poll conducted in the US in 2018, Instagram, YT as well as Snapchat are the top three sites frequented by teenagers, with 95 percent owning personal smartphones and 45 percent admitting to being always online (M. Anderson and J. Jiang, 2018). Instagram has also ranked as the topmost used

application by adolescents in India per business standard publication in 2020.Instagram has been the worst application since the viewers confirmed that visual aesthetics arouse depressive episodes and trigger anxiety (A. Macmillan, 2017). As per UNICEF, 1 out of every 7 Indians aged 15 to 24 years experience depression. Meanwhile, as a direct consequence of the covid pandemic and indoor confinement, Netflix and Amazon Prime usage and subscriptions have increased among Indians aged 17–26, as the AI algorithm of such platforms recognizes user preferences and caters to one's wants, on the contrary, the user inevitably can become hooked onto one's screens- a contributing factor to consumption and addiction (Dr. A. Vaidya et al., 2022). . In Italy, sleep disturbances, irregularities in the sleep cycle, and alterations in the sleep cycle schedule were observed in all age groups from 1 to 18, with a 12 percent delay in sleep routine among 13–18-year-olds during the coronavirus pandemic (Bruni et al., 2022).

RESEARCH METHODOLOGY:

This study used comparative/explanatory research. We have used statistical methods, Descriptive Statistics was used to summarize the data.Paired T-test was used to see if there was a significant difference in sleep patterns before and after the Covid-19 pandemic.

Cronbach's alpha was used to measure and to assess the reliability of the data

Snowball sampling was adapted. An online survey was circulated to Adolescents of Bangalore between the age group of 13-19.A total of 118 samples were collected using a Google Form.The collected data was converted using SPSS software, and the necessary statistics were extracted for data analysis and interpretation.

RESULTS: There is a significant difference in respondents' bedtimes before and after Covid; the mean difference is (2.91 Vs 3.43). There is a difference in sleep hours and wake-up times (1.37 vs 2.29) Social networking site usage increased from 39 % before the covid to 50 % (59 of the respondents) during the covid, representing half of the study population.

Table:1-Demographic details

	Age	Frequency	Percent
Age	13	13	11.0
	14	7	5.9
	15	5	4.2
	16	34	28.8
	17	39	33.1
	18	11	9.3
	19	9	7.6
Gender	Male	45	38.1
	Female	73	61.9
Education	Middle School	5	4.2
	High	24	20.3

	School		
	PUC	79	66.9
	Under Graduate	10	8.5

The above table shows the demographic details of the participants 33 %(39) of Respondents the age of 17years, the second-highest 28.8%(38) of the respondents are from the age group of 16 years a total of 61.9% of respondents were females and 38.1%(45) of the respondents were male majority the respondents i.e.66.9% of them were studying in PUC.20.3%(24) of them were High school Students.

Table:2-Comparison of bedtime before and during the lockdown in adolescents

	Before Covid		After Covid	
	Fixed Bedtime			
	Frequency	Percent	Frequency	Percent
Yes	70	59.3	30	25.4
No	48	40.7	88	74.6
Total	118	100.0	118	100.0
Sleep timings				
	Frequency	Percent	Frequency	Percent
8-9 pm	5	4.2	2	1.7
9-10 pm	32	27.1	16	13.6
10-11 pm	50	42.4	29	24.6
11-12 pm	31	26.3	71	60.2
Wake up timings				
6-7 am	87	73.7	40	33.9
7-8 am	23	19.5	30	25.4
8-9 am	3	2.5	22	18.6
9-10 am	5	4.2	26	22.0
Afternoon Nap				
3 hours	2	1.7	10	8.5

2 hours	10	8.5	15	12.7
1 hour	17	14.4	23	19.5
No nap	89	75.4	70	59.3
Time is taken to fall asleep				
10-15 minutes	53	44.9	37	31.4
15-20 minutes	21	17.8	17	14.4
20-30 minutes	19	16.1	21	17.8
30 minutes and more	25	21.2	43	36.4

Reports the comparison of bedtime among adolescents,59.3% (70) of the respondents had a fixed bedtime before Covid, and 74% (88 of 118) respondents have reported that they do not have any fixed bedtime That is a notable difference during currently

(Table 2). While awing a comparison in the sleep timings it is found that 42.4%(50) of adolescents used to sleep between 10-11 pm and there is a significant change in the timings during the pandemic about 60%(71) of adolescents sleep late i.e between 11-12 pm compared to pre covid.

43.2 % (51) of adolescents reported that their sleep duration was 7-8 hours before covid, but it has since changed to 8-9 hours during covid. 20.3 % (24) of respondents reported sleeping for 8-9 hours. 4.2 % of the population used to sleep 9-10 hours before covid; now, 11 % (13) have reported sleeping 9-10 hours. 36.4%(43) of respondents take 30 minutes or more to fall asleep during covid. Wake up timings has a significant difference 73.7% of adolescents used to wake up between 6-7 am before covid and now it has decreased to 33.9%.

Table-3 Comparison of sleep disturbances

		Before Covid		During Covid	
		Frequency	Percentage	Frequency	Percentage
Difficulties falling asleep	Yes	22	18.6	44	37.3
	No	54	45.8	42	35.6
	Sometimes	42	35.6	32	27.1
Nightmares	Yes	31	26.3	32	27.1
	No	67	56.8	64	54.2
	Sometimes	20	16.9	22	18.6

Daytime Sleepiness	Yes	40	33.9	54	45.8
	No	43	36.4	38	32.2
	Sometimes	35	29.7	26	22.0
Concentration in class	Yes	76	64.4	35	29.7
	No	24	20.3	41	34.7
	Sometimes	18	15.3	42	35.6
Irritated daytime	Yes	26	22.0	35	29.7
	No	58	49.2	41	34.7
	Sometimes	34	28.8	42	35.6
Awakenings in night	Yes	30	25.4	41	34.7
	No	48	40.7	41	34.7
	Sometimes	40	33.9	36	30.5
Snoring	Yes	8	6.8	11	9.3
	No	96	81.4	92	78.0
	Sometimes	14	11.9	15	12.7

Table :3 - 37.3% of the respondents face difficulty falling asleep during covid,45.8(54)of the adolescents have reported that they face daytime sleepiness.35.6% sometimes feel irritated during the daytime during covid.

Table-4- Usage of Digital media before 2 hours of bedtime

		Before Covid		During Covid	
		Frequency	Percent	Frequency	Percent
Social networking sites (FB, Insta, Whatsapp)	Never	44	37.3	34	28.8
	Occasionally/Sometimes	28	23.7	25	21.2
	Everyday	46	39.0	59	50.0
Video games	Never	86	72.9	81	68.6
	Occasionally/Sometimes	19	16.1	23	19.5
	Everyday	13	11.0	14	11.9

watching online videos	Never Occasionally/Sometimes Everyday	48 41 29	40.7 34.7 24.6	40 36 42	33.9 30.5 35.6
Reading E-books	Never Occasionally/Sometimes Everyday	80 33 5	67.8 28.0 4.2	75 32 11	63.6 27.1 9.3
video calls/ calls on phones	Never Occasionally/Sometimes Everyday	61 38 19	51.7 32.2 16.1	53 37 28	44.9 31.4 23.7
watching TV/ Web series	Never Occasionally/Sometimes Everyday	55 34 29	46.6 28.8 24.6	45 28 45	38.1 23.7 38.1

Here respondents were inquired about the usage of digital media two hours before sleeping so that we can have a clear picture of the influence of digital media and its influence on deep disturbances among adolescents. Social networking site usage increased from 39 % before the covid to 50 % (59 of the respondents) during the covid, representing the study population. 35% (42) of respondents have increased their daily online video viewing, compared to 24.6 percent (29) respondents previously. 23.7 percent (28) vs 16.1 % (19) respondents have begun cultivating the habit of video calls/phone calls before two hours of their bedtime. Every day during Covid, 38. % of adolescents began watching TV/web series.

Table:5 -Social media and OTT platform data

Most used social media				
	Before Covid		During Covid	
	Frequency	Percentage	Frequency	Percentage
Instagr	44	37.3	62	52.5

am				
Facebook	1	.8	2	1.7
YouTube	38	32.2	28	23.7
Whats App	28	23.7	18	15.3
Any other	7	5.9	8	6.8
Most used OTT platform before sleeping				
	Before Covid		During Covid	
	Frequency	Percentage	Frequency	Percentage
Netflix	22	18.6	32	27.1
Amazon Prime Video	18	15.3	15	12.7
Zee 5	4	3.4	6	5.08
Hotstar	10	8.5	13	11.01
Any other	64	54.2	52	44.06

52.5 percent (62) of the adolescents reported using Instagram before going to sleep, which is the highest usage, and there is also a significant increase in using Instagram during Covid 52.5 percent vs 37.3 percent before covid). YouTube usage has decreased from 32.2 percent before Covid to 23.7 percent during Covid. WhatsApp usage has also decreased in comparison.

The use of OTT platforms before sleeping for various purposes such as web series, reality shows, and so on has increased. According to 27.1 percent (32) of respondents, their use of Netflix during covid has increased when compared to pre covid, and use of Hotstar has increased when compared to pre covid.

Table:6-Comparison of sleep disturbances before and during Covid in children and adolescents.

Descriptive Statistics	Mean	Std. Deviation
Age (in years)	16.25	1.618
Gender	1.62	.488
Education	2.80	.648

Did you have a fixed bedtime before Covid?	1.41	.493
What was your bedtime before the pandemic (Covid)	2.91	.837
How many hours do you sleep? (Before pandemic)	1.88	.829
By what time do you wake up before Covid?	1.37	.737
How long do you take your afternoon nap? (before the pandemic)	3.64	.712
How long do you take to fall asleep after you get to your bed,(before the pandemic)	2.14	1.205
Do you have difficulties falling asleep	2.17	.720
Have you encountered Nightmares?	1.91	.654
Do you feel sleepy during the Daytime?	1.96	.800
Are you able to concentrate in class	1.51	.748
Do you feel irritated during the daytime?	2.07	.713
Do you wake up in the middle of the night?	2.08	.769
Do you snore while sleeping?	2.05	.431
How long do you use your phone/tab/laptop before going to sleep? (Before pandemic)	1 .92	1.018
Which is the most used social media platform before sleeping (before covid)	2.60	1.353
Which OTT platform do you spend your maximum time before sleeping? (Before covid)	3.64	1.662
Social networking sites (FB, Insta, WhatsApp)	2.02	.877
Videogames	1.38	.678
watching online videos	1.84	.795
Reading E-books	1.36	.565

video calls/calls on phones	1.64	.746
watching TV/Web series	1.78	.818
Do you have a fixed bedtime now?	1.75	.437
What is your bedtime during covid 19 pandemic	3.43	.790
How many hours do you sleep? (During a pandemic)	2.06	1.007
By what time do you wake up during a pandemic (Covid-19)	2.29	1.155
How long do you take your afternoon nap? (during a pandemic)	3.30	.990
How long do you take to fall asleep after you get to your b? (Now)	2.59	1.269
Do you have difficulties falling asleep	1.90	.799
Have you encountered Nightmares?	1.92	.674
Do you feel sleepy during the Daytime?	1.79	.815
Are you able to concentrate in class	1.76	.792
Do you feel irritated during daytime	2.06	.809
Do you wake up in the middle of the night?	1.96	.810
Do you snore while sleeping?	2.03	.470
How long do you use your phone/tab/laptop before going to sleep? (during a pandemic)	2.43	1.143
Which is the most used social media platform Before sleeping? (During Covid)	2.22	1.397
Which OTT platform do you spend your minimum time before sleeping? (During covid)	3.32	1.734
Social networking sites (FB, Insta, Whatsapp)	2.21	.866
Videogames	1.43	.698

watching online videos	2.02	.837
Reading E-books	1.46	.662
video calls/calls on phones	1.79	.804
watching TV/Web series	2.00	.877
Do you use a smartwatch?	1.72	.451

Table:6

The above table shows a paired comparison of the variables; the mean difference between before and during covid is visible in the table. There is a significant difference in respondents' bedtimes before and after Covid; the mean difference is (2.91 Vs 3.43). There is a difference in sleep hours and wake-up times (1.37 vs 2.29)

The mean difference also demonstrates that there is no difference in snoring (2.05 vs 2.03), nightmares (1.91 vs 1.92), and videogame viewing (1.38 vs 1.43).32.3% of adolescents have reported that they have difficulties sleeping currently whereas it was 18.6% before covid and 64.4% of the respondents have problems currently in concentrating during their online classes.

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Did you have a fixed bedtime before Covid? - Do you have a fixed bedtime now?	-.339	.630	.058	-.454	-.224	-5.85	117	.000
What was your bedtime before the pandemic(Covid) - What is your bedtime during covid 19 pandemic	-.525	.903	.083	-.690	-.361	-6.32	117	.000
How many hours do you sleep?(before pandemic) - How many hours do you sleep? during a pandemic)	-.178	1.196	.110	-.396	.040	-1.62	117	.109
By what time do you wake up before Covid? - By what time do you wake up during a pandemic (Covid-19)	-.915	1.144	.105ss	-1.124	-.707	-8.69	117	.000

How long do you take your afternoon nap?(before pandemic) - How long do you take your afternoon nap?(during pandemic)	.339	.787	.072	.196	.482	4.68	117	.000
How long do you take to fall asleep after you get to yourbed,(before the pandemic) - How long do you take to fall asleep after you get to your bed?(Now)	-.458	1.06	.098	-.651	-.265	-4.69	117	.000
Do you have difficulties falling asleep - Do you have difficulties falling asleep	.271	.770	.071	.131	.412	3.83	117	.000
Have you encountered Nightmares? - Have you encountered Nightmares?	-.008	.547	.050	-.108	.091	-.168	117	.867
Do you feel sleepy during the Daytime? - Do you feel sleepy during the Daytime?	.169	.777	.072	.028	.311	2.37	117	.019
Are you able to concentrate in class - Are you able to concentrate in class	-.254	.742	.068	-.389	-.119	-3.72	117	.000
Do you feel irritated during the daytime? - Do you feel irritated during daytime	.008	.790	.073	-.136	.152	.12	117	.907
Do you wake up in the middle of the night? - Do you wake up in the middle of the night?	.127	.812	.075	-.021	.275	1.70	117	.092
Do you snore while sleeping? - Do you snore while sleeping?	.017	.369	.034	-.050	.084	.49	117	.619
How long do you use your phone/tab/laptop before going to sleep?(before pandemic) - How long do you use your phone/ tab/ laptop before going to sleep? (during pandemic)	-.517	1.218	.112	-.739	-.295	-4.61	117	.000
Which is the most used Social media platform before sleeping (before covid) - Which is the most used Social media platform Before sleeping? (During Covid)	.381	1.205	.111	.162	.601	3.44	117	.001

Which OTT platform do you spend your maximum time before sleeping?(Before covid) - Which OTT platform do you spend your minimum time before sleeping?(during covid)	.322	1.432	.132	.061	.583	2.44	117	.016
Social networking sites(FB,Insta,Whatsapp) - Social networking sites (FB,Insta,Whatsapp)	-.195	.617	.057	-.307	-.082	-3.43	117	.001
videogames - videogames	-.051	.469	.043	-.136	.035	-1.18	117	.241
watching online videos - watching online videos	-.178	.579	.053	-.284	-.072	-3.34	117	.001
Reading E-books - Reading E-books	-.093	.523	.048	-.189	.002	-1.94	117	.055
video calls/calls on phones - video calls/calls on phones	-.144	.543	.050	-.243	-.045	-2.88	117	.005
watching TV/Web series - watching TV/Web series	-.220	.741	.068	-.355	-.085	-3.23	117	.002

The above table:7 shows that the Sig(2tailed), it is found that there is a small p-value in the majority of the questions shown above. There is less than a .05 p-value i.e.a, a .000 value in comparison questions of fixed bedtime, changes in the bed timings, and, waking up timings.

There is also a significant difference observed with the range of values acquired were p-value being .002 in watching tv/web series,005 p-value in using social media, and 001 p-value in using a mobile phone before going to bed. hence p-value proves the differences which lie between pre and during covid and the overall comparison between the two.

Table:8 -Intraclass Correlation Coefficient

	Intraclass Correlation[b]	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Average Measures	.658[c]	.564	.741	2.926	117	5148	0.000

Table 8: Interclass correlation value of Reliability is .658 which proves that further studies are significant and the questionnaire can be modified for expanding the same study

CONCLUSION:

This is a systematic study that examined the influences of digital media on changes in sleep patterns during the Covid-19 pandemic among adolescents in Bengaluru city. As we are aware of the increase in the usage of digital media following Covid, this study focused on proving that the increase in the usage of digital media has resulted in changes in sleep patterns and caused sleep disturbances among young minds. 59.3% (70) of the respondents had a fixed bedtime before Covid,74% (88 of 118) respondents have reported that they do not have any fixed bedtime,32.3% of adolescents have reported that they have difficulties while sleeping currently whereas it was 18.6% before covid,64.4% of the respondents have problem currently in concentrating during their online classes. . 35% (42) of respondents have increased their daily online video viewing, compared to 24.6 percent (29) respondents previously. 23.7 percent (28) vs 16.1 % (19) respondents have begun cultivating the habit of video calls/phone calls before two hours of their bedtime, social media have a broad reach into the lives of many young people and therefore have the potential to strongly influence their decisions. (Moreno, 2014). There is not much difference in snoring patterns from pre covid and Post Covid.

Adolescents have reported significant differences in their Adolescents have reported a significant difference in their napping patterns during the day. During Covid, 19.5 percent of respondents take a one-hour nap every day. 29.7 percent of adolescents have also reported being irritated during the day. It is because they spend a lot of time at night using their phones and their sleep pattern is disrupted, so they feel irritated during the day, which indirectly results in their interaction with parents, family, and friends being ruined or leading to antisocial behaviour. Adolescents who had a set routine prior to covid have altered their daily routine and gradually increased their screen time. 35 percent (42) of respondents increased their daily online video viewing, up from 24.6 percent (29) previously.

23.7 percent (28) vs. 16.1 percent (19) of respondents have started making video/phone calls before two hours of bedtime. Every day during Covid, 38% of adolescents started watching TV/web series. As a result, this study investigates the causes of sleep pattern changes and sleep disturbances in adolescents. The extent to which digital media influences sleep pattern changes,it also accurately compares changes in sleep patterns before Covid-19 to now, during the pandemic relationship between Sleep disturbances and Digital Media influence

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