RESEARCH ARTICLE

SCREENTIME USAGE WITH SLEEP PATTERN AND OBESITY AMONG SCHOOL CHILDREN DURING COVID-19 LOCKDOWN

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ABSTRACT

Background: In worldwide the obesity and overweight has been more than 1.9 billion in adults, 38 million in children under the age of 5 years, and over 340 million in children and adolescents aged 5-19 years. India is widely populated country with a population of 1.3 billion people spread into many states having wide economic and social disparities, health inequalities and distinct cultures. The study was conducted to assess the association of screen time usage with sleep pattern and obesity among school children during COVID-19 lockdown. **Objectives:**

- To assess the screen time usage with sleep pattern among school children.
- To assess the screen time usage with obesity among school children.
- To associate the screen time usage with sleep pattern among school children.
- To associate the sleep Pattern with obesity among school children.
- To associate the sleep Pattern among school children with their selected demographic variables.

Methods: In this study based on descriptive design using quantitative method to assess the association of screen time usage with sleep pattern and obesity among school children during COVID-19 lockdown by using purposive sampling technique. The data collection period was one week. Total sample size was 51 participants, school children. Samples were collected from selected area of Puducherry (Lawspet PHC).

Result: In this study most of school children use the internet on daily basis is 51%, more than once a day 24% and once a day 25%. Majority of the school children 51% had inadequate sleep and 49% had moderate sleep pattern. This result can help to improve the sleep pattern and reduce screen time usage and obesity among school children. **Conclusion:** The present study reveal that school children have moderated and inadequate sleep pattern, majority of children spend on internet usage and gained overweight during COVID-19 lockdown. It is responsibility of the health care professional to create awareness on screen time usage, sleep pattern and obesity among school children during COVID-19 lockdown.

INTRODUCTION

Severe acute respiratory syndrome corona virus 2 (SARSCoV-2), was discovered in (Wuhan) China during the recent epidemic of pneumonia in January 2020. According to World Health Organization (WHO),"Corona virus disease (COVID-19) is an infectious disease caused by a newly discovered corona virus". The most common reported symptoms include fever (83%), cough (82%), and shortness of breath (31%), and Gastrointestinal symptoms (2–10%) of the patients [1].

In globally and also in India, the spread of corona virus disease (COVID-19) increases rapidly. The covid19 cases of children were less than 5% than the total positive (COVID-19) cases of individuals [2]. In worldwide, the novel corona virus disease (COVID-19) pandemic has added various challenges and changes, causing an unpredictable impact on human life, and social life and has affected the local and international economy. Due to this pandemic situation, the governments all around the world had implements strict measures such as complete or partial lockdown, isolation, quarantine and social distancing [3].

According to this pandemic situation, World Health Organization (WHO) has declared the corona virus disease (COVID -19) outbreak a pandemic and spreads rapidly worldwide and it affects more than 200 countries around the world. And they have also focused on avoiding contracting the virus through the practices of good hygiene, social distancing [4]. School-aged children were classified by age into two groups, children aged (5–11years) and adolescents aged (12-17years). The State Health Department, confirmed (COVID-19) cases were identified and reports were submitted for the weeks beginning (March1–September13), 2020. In United states they were reported, a total of 277,285 laboratory-confirmed cases of COVID-19 in school-aged children during (March 1–September 19, 2020) [5]. Children were the more vulnerable group to get more infections. This pandemic leads to the lack of outdoor physical activities, could increase weight of the children and also vitamin-D deficiency will occurs. Children are mostly encouraged to do their study works in online. So, they use internet for their study purposes. They also follow social media to chat with friends, social media plays major role in affecting children, getting addicted to various harmful substances [6]. During, lockdown our physical activity, sedentary behaviour, smart phone use, and sleep patterns changed. Recent evidence has shown that the sedentary behaviour causes cardiovascular diseases. Less physical activities & screen time usage around (3hrs-4hrs/day), and increased sitting time (>8 hrs/day) leads to the causes of all-mortality, low physical activities also affects the sleep pattern [7].

Due to this pandemic situation, the people had to spend more time at their homes. This leads to use more electronic devices has become regular activities in our life. Mostly, for all students' classes are conducted through the online process. So, many activity patterns and sleep patterns changed in the lockdown period. The prolonged screen time usage affects the sleep pattern of the children [8]. Extension of lockdown affects the school children and adolescents, and they were confined to stay home in this pandemic situation. This restriction led to unconstrained sleep schedules, prolonged screen exposure limited outdoor activity and reduced peer interactions, affects the sleep pattern and sleep disturbance in children and adolescents. Due to this improper sleep schedule, the usage of digital media near bed time affects sleep patterns of children were changed, also they report lower sleep quality [9]. Obesity is a condition, when a person carries excess of body weight or body fat which leads to many chronic diseases. Due to this sudden lockdown, the changes occur in the activity pattern and weight status among people. Millions of students were affected by this school closure. In Italy, the children's lifestyles were changed and 41 children and adolescents with obesity in (COVID-19) lockdown [10].

Obesity is an abnormal or excessive fat accumulation which causes risk to human health. In this lockdown the range of Obesity were increased. Due to this lockdown, the schools were closed and it affects the Activity patterns and weight status of youths. Lack of exercise and increased screen time usage and sleeping time after covid-19 during lockdown leads to obesity [11]. India is a widely populated country with a population of 1.3 billion people, spread into many states. It faces great challenge in this COVID-19 pandemic. Social isolation helps to reduce the infection to family, friends. It leads to long term usage of digital devices that may alter the physical activity, and mental well-being.

Sedentary lifestyle, excessive screen exposure, leads to improper sleep habits and also increase BMI among children [12]. During lockdown, due to the restriction of government and life style changes causes poor psychological wellness. Poor physical and mental wellness due to the fear of contagious diseases, isolation, and reduced social contact. It, leads to the unhealthy behaviours such as improper diet, sleep, alcohol consumption, and lack of physical activities. Due to this pandemic situation, the life stress has been connected to unhealthy eating, and stressed people are more likely to crave food high in energy, fats and sugar [13].

IN WORLD LEVEL: In Globally, the corona virus disease (COVID-19) first case was reported at the end of 2019.According to world health organization (WHO) "The disease spread rapidly all around the world and declared worldwide pandemic". In, worldwide there were 1,436,198 confirmed cases of covid19 was reported and 6% of mortality rates. The children around (1% - 5%) were diagnosed as covid19,and 90%were diagnosed as asymptomaticdisease, and then 6.7% were confirmed as sever case [14]. From Jan-16, 2020 to Feb-8, 2020 were the Nationwide (COVID-19) cases of pediatrics around 2135 cases reported to the Chinese Centre for Disease Control and Prevention (CDC). On March 2,2020 a total number of 80174 (COVID-19) cases in China, and 8774 cases in other 64 countries were confirmed [15]. The novel corona virus (COVID-19) was mostly affecting the adults than the children, this highly leads to severe acute respiratory syndrome and even end up in death. The clinical manifestations among children were also lower than the adults [16].

In December ,2019 covid19 was first outbreak in Wuhan, (Chiba) and it spread all over the world and it becomes pandemic. On, January 7,2020, a new type of corona virus was founded and isolated by the Chinese Centre for Disease Control and Prevention (CDC). After that the World health organization (WHO) named it as covid19. On, March 18, 2020 the disease start spreading all over the world [17]. Due to this pandemic, many countries decided to close schools to follow isolation and social distancing to reduce covid-19 cases and to reduce the burden of health workers. The UN educational, scientific and cultural organization estimates that 138 countries closed schools. The 80% of the children education were affected around worldwide [18]. In worldwide, the obesity and overweight has been more than 1.9 billion in adults, 38 million in children under the age of 5yr, and over 340 million in children and adolescents aged 5-19 yrs.[19].

IN NATIONAL LEVEL

In India, the first case of covid-19 was reported in the state of Kerala on Jan 30,2020. The students were affected who were returned from Wuhan, China. Then, the covid-19 spread all over the World. On, October 10,2020 the cases range of 29-182 per residents in various states [20].

IN PUDUCHERRY

In Southern India, over ≈1.25 million population is located in Puducherry district. Its earliest recorded case of COVID-19 was in March 2020; it had 7 total cases by the end of May, 67 by end of June, and 663 by end of July, 2020. The district followed national COVID-19 management guidelines, including testing all symptomatic persons and their high-risk

contacts [21]. To move ahead of the rudimentary knowledge about the association of screen time usage with sleep pattern and obesity in school children during lockdown, we required in-depth insight into individual experiences. So the researchers were interested to conduct study on this topic "Associate the screen time usage with sleep pattern and obesity among School children during (COVID-19)lockdown".

METHODS AND MATERIAL

After obtaining consent from each school children, the researcher collected information from the school children. It took around 15 -20 minute to each children. Data was collected as per availability of the case and on average 10 samples were selected per day. The data collection period was one week.
Data was collected and checked with school children among selected community area in Puducherry. The collected data was summarised and tabulated by utilizing descriptive statistics which includes frequency, percentage, mean percentage, standard deviation and inferential statistics. Chi-square test used to find the association of screen time usage with sleep pattern and obesity among school children during covid-19 lockdown.

RESULTS

Section A:Description of the demographic variables and anthropometric parameters among school children during COVID-19 lockdown: Out of the 51 school children during COVID-19 lockdown who were interviewed, Majority of the school children 29 (56.8%) were in the age group of 13-15 years. Most of the school children were female 27 (52.9%). Majority of the school children were completed 24 (47.1%) in 5th -7th standard. Most of the school children's mothers were house wife 36 (70.5%). Most of the school children's fathers were private employee 37 (72.5%). Majority of the school children family were number of children is two 39(76.5%). Most of the school children comes under nuclear family 27 (52.9%). Most of the school children were second child in order of birth 28 (54.9%). Majority of the school children were middle class family 41 (80.4%).
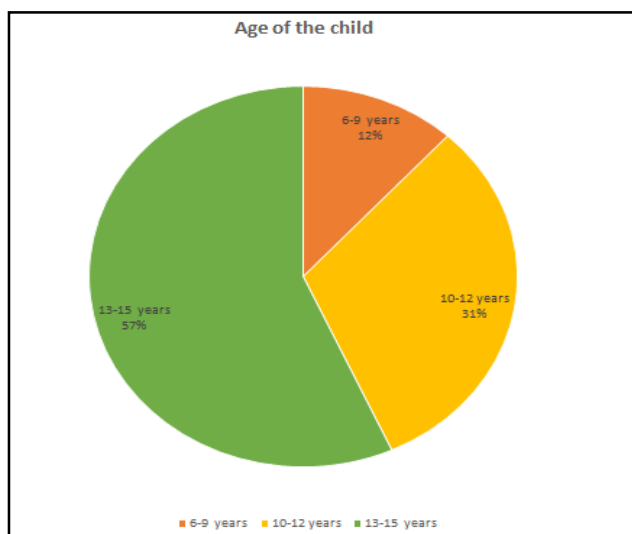

Fig. 1. Percentage distribution of age of the child among school children

Most of the school children were followed by Hindu religion 41 (80.4%). Majority of the school children were lived in urban area 33 (64.7%). Majority of the school children were BMI before COVID 19 lockdown 33 (64.7%) and mean BMI was 17.84. Majority of the school children were BMI after COVID 19 lockdown 23 (45.1%) and mean BMI was 19 respectively.
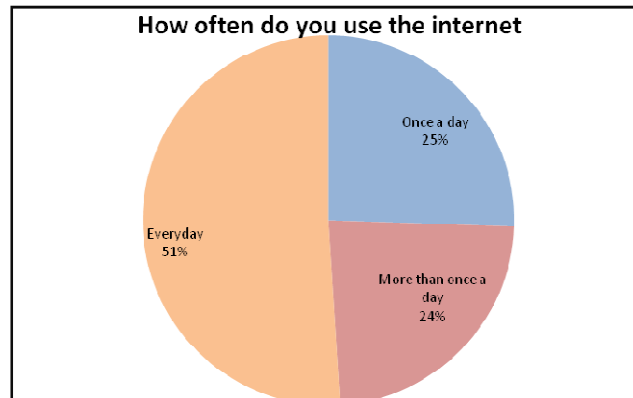

Fig. 2. Percentage distribution of How often do you use the internet among school children

Section B: Assessment of the screen time usage among school children during COVID-19 lockdown: The majority of schoolchildren use the internet on a daily basis. 26 (51%) people voted. Most of the school children were more than 2 hours spends on the internet 21 (41.2%).Majority of the school children were gaming in online 28 (54.9%).Most of the school children were using smart phone at home 45 (88.2%).Majority of the school children were having personal smart phone 36(70.6%).Most of the school children were using 1-300MB monthly data plan 43 (84.3%).Majority of the school children were reading activities in device 21 (41.2%). Most of the school children were somewhat comfortable using device for schoolwork 24 (47.1%). Majority of the school children were used in device for movies 25 (49%). Most of the school children were friends house use to access the internet 30 (58.8%) respectively.

Section C: Assessment of the level of sleep pattern among school children during COVID-19 lockdown

LEVEL OF SLEEP PATTERN AMONG SCHOOL CHILDREN DURING COVID-19 LOCKDOWN.	FREQUENCY (N)	PERCENTAGE (%)
Inadequate sleep	26	51
Moderate sleep	25	49
Adequate sleep	0	0
Total	51	100

Table 1 shows frequency and percentage wise distribution of level of sleep pattern among school children during COVID-19 lockdown. Majority of the school children 26 (51%) had inadequate sleep and 25 (49%) had moderate sleep pattern respectively.

Table: 2 depicts mean and standard deviation of level of sleep pattern (domain wise) among school children during COVID-19 lockdown. The highest score was Disorder of initiating and maintaining sleep domain (13.05±2.99) and lowest score was Sleep hyperhidrosis domain (3.549±1.346) respectively.
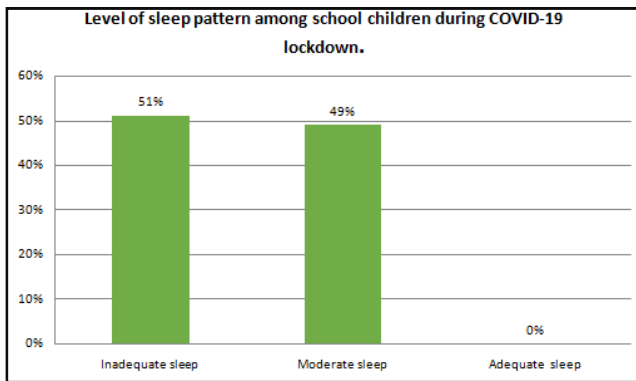
Fig. 3. Percentage wise distribution of level of sleep pattern among school children during COVID-19 lockdown

Table 2. Mean and Standard deviation of level of sleep pattern (domain wise) among schoolchildren during COVID-19 lockdown

(N = 51)

LEVEL OFSLEEP PATTERN (DOMAIN WISE)	MEAN	STANDARD DEVIATION
Disorder of initiating and maintaining sleep (H)	13.05	2.99
Sleep breathing disorders sleep	5.058	1.190
Disorders of arousal	4.862	1.131
Sleep-wake transition disorders	10.08	2.522
Disorders of excessive somnolence	8.372	2.705
Sleep hyperhidrosis (L)	3.549	1.346
Total	44.97	11.88

Section D: Assessment of the obesity among school children during COVID-19 lockdown: Majority of the school children were one or two times a week maintain a regular meal pattern 31 (60.8%). Most of the school children were one or two times a week balanced diet by including healthy ingredients 32 (62.7%). Majority of the school children were 1 or 2 times a week takes fruits and vegetables23 (45.1%).
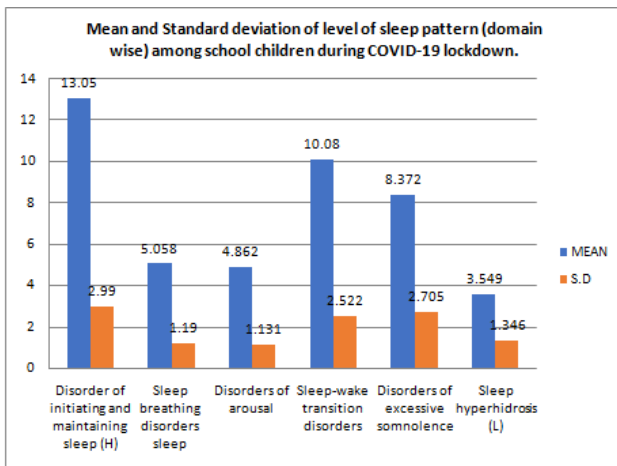

Fig. 4. Mean and Standard deviation of level ofsleep pattern (domain wise) among school children during COVID-19 lockdown.

Most of the school children were 3 to 4 times a week, eat like pulses, groundnuts, sweet potato, cassava and cereals 29 (56.9%). Majority of the school children were three to four times a week, consume chocolate and sweets 17(33.3%). Most of the school children were three to four times a week, consume raw fruits and vegetables 33 (64.7%). Majority of the school children were five to six times a week, consume milk and other daily products 26 (51%).

Most of the school children were One to two times a week consume junk food like popcorn, chip etc. as snacks28 (54.9%).Majority of the school children wereOne to two times a week, consume fast food like Pizza, burger, pasta or noodles as snacks or meals 27 (53%). Most of the school children were One to two times a week, consume sugar sweetened beverages like juice, soft drinks 101 (50.5%) respectively.

Table 3: Frequency and Percentage wise Distribution of demographic and anthropometric parameters amongschool children during COVID-19 lockdown.

(N=51)

SL. NO	DEMOGRAPHIC VARIABLES AND ANTHROPOMETRIC PARAMETERS	FREQUENCY (N)	PERCENTAGE (%)
1	Age of the child		
	6-9 years	6	11.8
	10-12 years	16	31.4
	13-15 years	29	56.8
2	Gender of the child		
	Male	24	47.1
	Female	27	52.9
3	Child Educational status		
	2nd -4th standard	23	45.1
	5th -7th standard	24	47.1
	8th -10th standard	4	7.8
4	Occupation of mother		
	House wife	36	70.5
	Private employee	14	27.5
	Government employee	1	2
5	Occupation of father		
	Own business	6	11.8
	Private employee	37	72.5
	Government employee	8	15.7
6	Family monthly income		
	Below 5000	3	5.9
	5000-10000	32	62.7
	Above 10000	16	31.4
7	Number of children in the family		
	1	7	13.7
	2	39	76.5
	3 or above	5	9.8
8	Type of family		
	Nuclear family	27	52.9
	Joint family	11	21.6
	Separate	13	25.5
9	Order of birth		
	First child	23	45.1
	Second child	28	54.9
	Third and above	0	0
10	Economic status		
	Low class family	7	13.7
	Middle class family	41	80.4
	High class family	3	5.9
11	Religion		
	Hindu	41	80.4
	Christian	8	15.7
	Muslim	2	3.9
12	Residence		
	Rural	18	35.3
	Urban	33	64.7
13	Child BMI before COVID 19 lockdown		
	Under weight	33	64.7
	Normal weight	13	25.5
	Over weight	5	9.8
	Obesity	0	0
13a	Child BMI before COVID 19 lockdown		
	Mean	17.84$\pm$3.55	
14	Child BMI after COVID 19 lockdown		
	Under weight	21	41.2
	Normal weight	23	45.1
	Over weight	7	13.7
	Obesity	0	0
14a	Child BMI after COVID 19 lockdown		
	Mean	19.0$\pm$3.64	

Table 4. Frequency and percentage wise distribution of screen time usage among school children during COVID-19 lockdown

(N=51)

SL. NO	SCREEN TIME USAGE AMONG SCHOOL CHILDREN DURING COVID-19 LOCKDOWN.	FREQUENCY (N)	PERCENTAGE (%)
1	**How often do you use the internet?**		
	Once a day	13	25.5
	More than once a day	12	23.5
	Everyday	26	51
2	**On average, how many hours per day do you spend on the internet**		
	Less than 1 hour a day	9	17.6
	1-2 hours	21	41.2
	More than 2 hours	21	41.2
3	**What do you like doing most online?**		
	Chat rooms	10	19.6
	Gaming	28	54.9
	Social network (Facebook, Instagram)	13	25.5
4	**What type of technology do you use at home**		
	Desktop PC	1	2
	Laptop	5	9.8
	Smart phone	45	88.2
5	**Do you have a personal smart phone?**		
	Yes	36	70.6
	No	15	29.5
6	**If you have a smart phone does it have a data plan?**		
	No data Plan	1	2
	1-300MB monthly data plan	43	84.3
	300-2GBmonthly data plan	7	13.7
7	**What school related activities do you have in your device?**		
	Reading	21	41.2
	Writing	15	29.4
	Projects	15	29.4
8	**Overall, how comfortable are you using your device for schoolwork?**		
	Not at all comfortable	17	33.3
	Somewhat comfortable	24	47.1
	Very comfortable	10	19.6
9	**What other activities do you use your device for?**		
	Social media	18	35.3
	Movies	25	49
	Digital art	8	15.7
10	**What other places in your community do you use to access the internet?**		
	Library	4	7.8
	Friend's house	30	58.8
	Neighbourhood house	17	33.4

Table 5. Frequency and percentage wise distribution of obesity among school children duringCOVID-19 lockdown

(N=51)

SL. NO	OBESITY AMONG SCHOOL CHILDREN DURING COVID-19 LOCKDOWN	FREQUENCY (N)	PERCENTAGE (%)
1	**A regular meal pattern consists of 3 main meals and 2 snacks, during covid 19 pandemic how often did you maintain a regular meal pattern?**		
	Not routinely	14	27.5
	One or two times a week	31	60.8
	Three to four times a week	6	11.7
2	**During covid 19 pandemic how often do you have a balanced diet by including healthy ingredients (egg, vegetables, ghee, butter, wheat, millets, ragi) in your meal**		
	Not routinely	4	7.8
	One or two times a week	32	62.7
	Three to four times a week	15	29.4
3	**Children often include fruits and vegetables in their diet. During covid 19 pandemic, which is the frequency of your fruits and vegetables intake?**		
	Not routinely	9	17.6
	One or two times a week	23	45.1
	Three to four times a week	19	37.3
4	**During covid 19 pandemic how often do you eat like pulses, groundnuts, sweet potato, cassava and cereals?**		
	One to two times a week	19	37.2
	Three to four times a week	29	56.9
	Five to six times a week	3	5.9
5	**During covid 19 pandemic how often do you consume chocolate and sweets?**		
	One to two times a week	17	33.3
	Three to four times a week	17	33.3
	Five to six times a week	17	33.3
6	**During covid 19 pandemic how often do you consume raw fruits and vegetables?**		
	One to two times a week	12	23.5
	Three to four times a week	33	64.7
	Five to six times a week	6	11.8
7	**During covid 19 pandemic, how often do you consume milk and other daily products?**		
	One to two times a week	9	17.6
	Three to four times a week	16	31.4
	Five to six times a week	26	51
8	**During covid 19 pandemic, how often do you consume junk food like popcorn, chip etc as snacks?**		
	One to two times a week	28	54.9
	Three to four times a week	14	27.5
	Five to six times a week	9	17.6
9	**During covid19 pandemic how often do you consume fast food like Pizza, burger, pasta or noodles as snacks or meals?**		
	One to two times a week	27	53
	Three to four times a week	12	23.5
	Five to six times a week	12	23.5
10	**During covid 19 pandemic, how often do you consume sugar sweetened beverages like juice, soft drinks?**		
	One to two times a week	32	62.7
	Three to four times a week	6	11.8
	Five to six times a week	13	25.5

Section E: Association between screen time usage with level of sleep pattern among school children during COVID-19 lockdown: The screen time usage variable *How often do you use the internet* had shown statistically significant association between screen time usage with level ofsleep pattern among school children during COVID-19 lockdown with chi-square value at p<0.05 level.

Section F: Association between obesity with level of sleep pattern among school children during COVID-19 lockdown: The obesity variables had not shown statistically significant association between obesity with level ofsleep pattern among school children during COVID-19 lockdown respectively.

Section G: Association between level of sleep pattern among school children during COVID-19 lockdown with their selected demographic variables and anthropometric parameters: The demographic variables and anthropometric parameters had not shown statistically significant association between level of sleep pattern among school children during COVID-19 lockdown respectively.

CONCLUSION

In our study most of school children use the internet on daily basis is 51%, more than once a day is 24% and once a day is 25%. Majority of the school children 51% had inadequate sleep and 49% had moderate sleep pattern. This result can help to improve the sleep pattern and reduce screen time usage and obesity among school children. It is the responsibility of the health care professionals to create awareness on screen time usage, sleep pattern and obesity among school children during COVID-19 lockdown.

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