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Original Research Article

A cross-sectional study to explore the excessive screen usage and its impact among children visiting the OPD of a government tertiary care hospital of Uttarakhand

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Abstract

Background: In the modern extant children's proclivity towards lucrative screens is on the rise. Screen viewing can displace a variety of missed opportunities to practice developmental milestones such as language and motor skills. Personalized family media planning is needed.
Objective: Determine the impact of excessive screen time among children visiting the government tertiary care hospital of Uttarakhand.
Study Design: Cross-sectional study conducted for a 9-month duration. 491 healthy children (aged 1to18 years) visiting the pediatric Department OPD were enrolled as study participants.
Results: In the study population, the majority were underweight. The majority of children view television and mobile devices for 30 minutes to 2 hours per day. Positive correlation of increased BMI was found with duration of television and mobile exposure. The earliest age of screen usage was 2-3 years. Circumstances in which children used screens were before sleeping and while eating, whereas most adolescents use them for recreation. After stopping the screen device, the commonest response was irritability. By overuse of the screen, the most common physical change was loss of appetite and weight loss. In social changes, changes in sleep patterns and attention span were observed. In behavioral changes most common was anger.
Conclusion: To promote child health and development in the digital era, there should be a family screen plan for when, how, and where screens should be used. There should be a daily screen-free time and a limitation of routine or regular screen time to less than 1 hour per day.

Keywords: Screen, Children, Impact, Knowledge, Usage.

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1. Introduction

In the 21st century, babies to adolescents are digital consumers, which has resulted in a change in our social environment and has led to the saturation of our culture and daily lives by screen devices. Recent decades have seen an upsurge in the diversity of available screens. With technological advancements, screen devices have become pervasive in daily life. Television (TV), mobile phones, smartphones, computers, movies, and video games have assumed central roles in our children's daily lives and have dominated the lives of many children and adolescents, and occupied the spaces where they spend their leisure time.

Recent years have also seen schools adopting to digital teaching in classrooms as well as homework portals, thereby paving the way to digital replacement of textbooks. Screen viewing manipulates a child's brain and leads to addiction comparable to cocaine addiction. Too much screen time may be wreaking havoc on a child's brain during key years of development. Screen dependency disorder is a new lifestyle disease brought upon by technology. Moreover, it also leads to sedentary behaviour in kids, which can pave the way to cardiovascular diseases when they grow up. As per a meta-analysis, longer duration of TV viewing time is consistently associated with a higher risk of type 2 diabetes, fatal or non-

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fatal cardiovascular diseases, and all-cause mortality.[1] It leads to detrimental effects on children's wellbeing and causes emotional, mental, and physical problems. In children, increases in the time spent on screens have been found to negatively affect cognitive development, social interaction, and lead to attention deficits, behavioural problems, and obesity.[2-6]

Although there are myriad of priori on screen time but there is a dearth of rigorous evidence regarding the same from India and almost none from Uttarakhand. So, this study aims to bridge the gap regarding ideal screen time in relation to age, the reason for which it was introduced, and morbidity associated with it in the paediatric population**.** This study is done to evaluate knowledge regarding the use of screens among children and parents in Uttarakhand.

2. Materials and Methods

This was a cross-sectional study conducted over the duration of 9 months from July 2019 to March 2020. It included 491 healthy children, aged 1 to 18 years, who visited the hospital for their regular health visits, which included developmental assessment, vaccinations, and routine check-ups. Children with systemic involvement and developmental delay, and hemodynamically unstable children were excluded from the study.

After taking informed consent from parents, a survey was done with the help of a questionnaire. The following information was collected: demographics (age, gender, educational status), anthropometric parameters (weight, height, and body mass index). Centre for Disease Control and Prevention (CDC) growth charts were used for boys and girls to assess their body mass index percentiles. Underweight is defined as a BMI less than the 5th percentile, normal between the 5th to 85th percentile, overweight between the 85th to 95th percentile, and obese more than the 95th percentile.

Screen devices were classified into 3 types: mobile phones, televisions, and computers. To measure children's screen time per day, the question was "How much time did your child spend yesterday by himself/herself watching television, playing games, watching video, and/or using other apps on a mobile phone or computer?" Response options were "none," "less than 30 minutes," "about 30 minutes to 2 hours," "2 to 4 hours," "4 to 6 hours," and "more than 6 to 8 hours."

To determine children's age at first use, parents were asked, "How old was your child when she/he first did various activities on a screen device?" The activities listed were touching or scrolling the screen, calling someone, playing games, using computers, watching television shows, and using apps. Response options were less than 1year, around 2years, around 3years, around 4years, and 5years.

To understand the circumstances under which children use screen devices, parents were asked, "When did the child use a screen device?" Response options were "before sleeping," "while eating," and "for recreation."

To understand the reaction of the child after stopping the use of the screen device, parents were asked, "How does she/he react after switching off the screen device?" Response options were "irritable," "aggressive," "sad," or "apathy."

To understand the morbidity pattern caused by the overuse of screen devices, the following were assessed:

1. Physical change- loss of appetite/overeating, weight loss/weight gain, vision problems, headache.
2. Social change- alteration in sleep pattern, change in attention span.
3. Behavioural change- anxiety, loneliness, mood swings, anger.

Data was entered and analysed by the Statistical Package of Social Sciences (IBM SPSS) software. A descriptive analysis of all patients in the study was performed. Correlation was checked by Pearson's correlation. Chi-square test was used. The level of significance taken for all the statistical tests was a P value of <0.05.

3. Results

A total of 491 children aged 1-18 years were enrolled in the study over a duration of 9 months from July 2019 to March 2020. Male: female ratio was 1.8:1. Children were divided into the following groups according to age: Toddlers (1-3 years), Pre-school children (3-6 years), School age children (6-12 years), and Adolescents (12-18 years), amongst which the majority belonged to the school age group as shown in **Table 1**.

When the analysis was done as per the body mass index, the majority of children (243) had normal BMI, as shown in **Table 2**.

Assessment of children's screen time was done individually for each device. The majority of children (22.61% male and 13.03% female) view television for 30 minutes to 2 hours per day. In case of mobile exposure, 13.24% males and 10.18% females view mobile devices for 30 minutes to 2 hours per day. The majority of children (25.66%) did not view mobile. Television and mobile viewing were statistically significant with male gender (P value 0.016 and 0.019, respectively. Whereas the maximum number of children do not view computers. Only 13 males and 8 females were exposed to computers.

Children who view TV for more than 2 hours constitute 84 underweight, 19 overweight, 28 obese, and 64 children with normal BMI. Positive correlation was found between BMI and time of TV exposure (r value 0.228, p value 0.000)

Children who view mobile for more than 2 hours constitute 27 underweight, 20 overweight, 27 obese, and 18 children with normal BMI. Positive correlation was found

between BMI and time of mobile exposure (r=0.366, p=0.000). Only 1 obese child views the computer for more than 2 hours. Positive correlation was found between BMI and time of computer exposure (r=0.172, p=0.000). Most children first used mobile phones and TVs at the age of 2-3 years, as shown in **Table 3**.

When assessment of the circumstances in which the children used screen device was done, observation were, 72 toddler, 57 pre-school children, 77 school age children and 60 adolescents used screen device before sleeping which was statistically significant (P=0.008, chi square=11.70), 118 toddler, 92 pre-school children, 39 school age children and 20 adolescents use screen while eating which was statistically significant (P=0.000,chi square=182.71) and 10 toddler, 26 pre-school children, 111 school age children and 83 adolescents use screen while recreation which was statistically significant (P value 0.000, chi square=232.02).

The most common reaction of children in all the age groups after stopping the use of screen devices was irritability. (**Figure 1**) Morbidity pattern caused by overuse of screen devices comprises physical, social, and behavioural changes. (**Table 4**) Physical changes included loss of appetite, overeating, weight loss, weight gain, vision problems, and headache. Social changes included changes in sleeping patterns and changes in attention span. Behavioural changes included anxiety, loneliness, mood swings, and anger.

Table 1: Age & gender distribution of study participants (n=491)

	Male (n=315)		**Female(n=176)**	
	No.	%	No.	%
Toddler (1-3 Years)	101	32.06	27	15.34
Preschool children (3-6 years)	62	19.69	60	34.09
School-age children (6-12 years)	95	30.16	59	33.52
Adolescent (12-18 Years)	57	18.09	30	17.05

Table 2: Body mass index of study participants (n=491)

	Toddler (n=128)		**Preschool children (n=122)**		**School-age children (n=154)**		**Adolescent (n=87)**	
	No.	%	No.	%	No.	%	No.	%
Underweight	75	58.59	47	38.53	33	21.43	30	34.48
Normal	43	33.59	57	46.73	99	64.29	44	50.59
Overweight	6	4.69	2	1.63	9	5.84	9	10.34
Obese	4	3.13	16	13.11	13	8.44	4	4.59

Table 3: Age at first use of any digital device by study participants (n=491*)

			Age at first use of any digital device									
	Overall		**<1yr (n=53)**		**1-2yr (n=167)**		**2-3 years (n=305)**		**3-4 years (n=208)**		**4-5 years (n=24)**	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
TV	418	85.13	27	50.94	86	51.49	176	57.71	114	54.82	15	62.5
Mobile	317	64.56	22	41.51	75	44.92	123	40.33	88	42.30	9	37.5
Computer	22	4.41	4	7.55	6	3.59	6	1.96	6	2.88	0	0

*Multiple Response

Table 4: Morbidity pattern caused by the overuse of screen devices (n=491*)

		Toddlers (n=128)		Preschool children (n=122)		School-age children (n=154)		Adolescent (n=87)	
Physical changes	Loss of Appetite	74	57.8%	65	53.27%	83	53.89%	54	62.06%
	Overeating	54	42.18%	57	46.72%	71	46.1%	33	37.93%
	Weight loss	11	8.59%	101	82.78%	112	72.72%	47	54.02%
	Weight gain	15	11.7%	21	17.21%	42	27.27%	40	45.97%
	Vision problem	16	12.5%	26	21.31%	53	43.41%	41	47.12%
	Headache	10	7.8%	29	23.77%	43	27.92%	32	36.78%
Social changes	Change in sleep pattern	21	16.4%	36	29.5%	39	25.32%	19	21.83%
	Change in attention span	16	12.5%	29	23.77%	53	34.41%	28	32.18%
Behavioral changes	Anxiety	6	4.6%	27	22.13%	43	27.92%	34	39.08%
	Loneliness	4	3.12%	21	17.21%	21	13.63%	26	29.88%
	Mood swings	28	21.87%	24	19.67%	53	34.41%	29	33.33%
	Anger	52	40.62%	38	31.14%	62	40.25%	42	48.27%

*Multiple Response

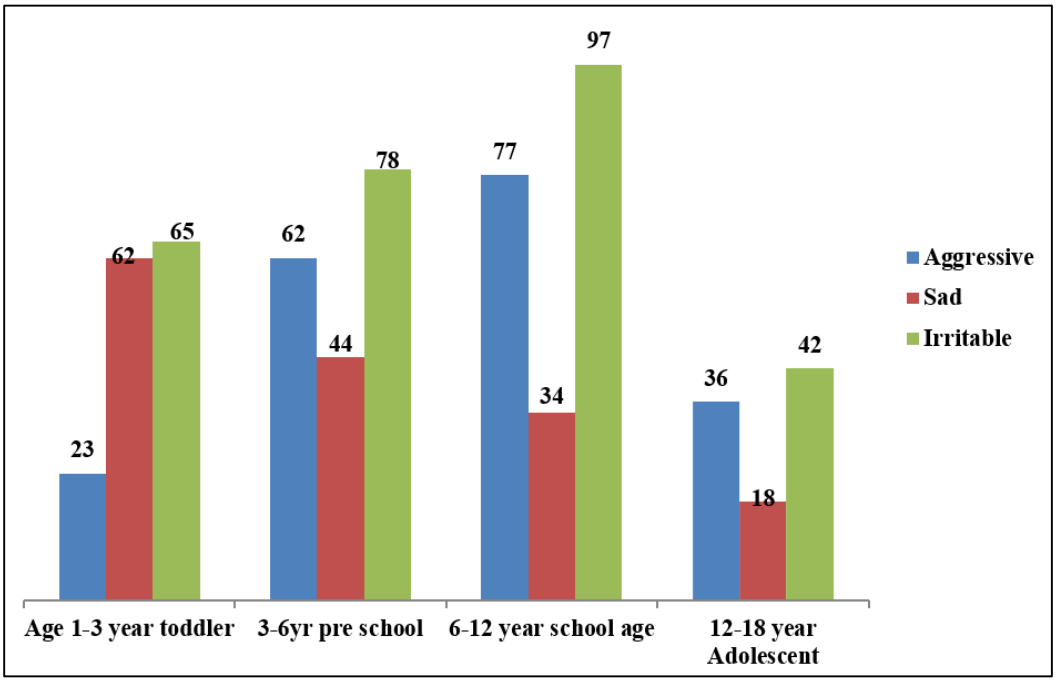

Figure 1: Reaction noticed after ceasing screen use across various age groups (n=491*)

4. Discussion

In this study, 491 children were enrolled; the majority of them were school-going children in the age group 6-12 years. On assessing the screen viewing time per day, maximum screen time was 30 minutes to 2 hours per day for television. In case of mobile viewing, most children do not view mobile at all. This may be due to the population belonging to low socio-economic status where only the father owns the mobile, and as the father has to go out for work, so children don't have much access to mobile. Both Television and mobile viewing were statistically significant with male gender. High screen time for males' gender is disturbing and detrimental to health as it is inversely proportional to outdoor play time. The maximum number of children who do not use computers in our study. This may also be due to the financial constraints of the family. On the contrary, Kabali et al found that, on average, children spend 47 minutes on mobile devices, 45 minutes a day watching television, and 15 minutes per day playing games on video consoles.[7] This difference in more use of mobile devices may be due to the disparity in socio-economic status in both studies.

Time with screens is an important risk factor for childhood obesity, which was comparable to our study. The more screen time, the higher the chance of a child becoming obese. Television viewing is linked to increased BMI.[8] Screen viewing leads to all energy 'in' and no energy 'out' and leads to weight gain after hours of watching a screen device.[9]

For each hour of television viewing per day, children consume an additional 167 calories, which could result in obesity in the future.[10] The correlation between screen time of various modes of screens concerning body mass index was assessed. In the present study, amongst 26 overweight and 37 obese children, 19 and 28 children viewed television for more than 2 hours, and there was a positive correlation between TV exposure time and weight (r=0.228, p=0.000). A similar observation was made with the mobile screen and increased weight. Amongst 26 overweight and 37 obese children, 20 and 27 children respectively viewed mobile for more than 2 hours, and there was a positive correlation amongst them (r=0.366, p=0.000). The reason for weight gain may be the habit of snacking while watching the screen device, secondly, it may be due to the decreased physical activity while watching the screen, and thirdly, it may be due to the exposure of children to different food advertisement which stimulates the appetite.

In the present study, most children first used mobile phones and TVs at the age of 2-3 years. On the contrary, Kabali et al observed that the age at which the children first used the mobile device was 1 year.[7]

Most parents let their children use screens before sleeping. In the toddler and pre-school age group maximum number of children use screens while eating, whereas the school age and adolescent age group uses them for recreation. Kabali et al,[7] enrolled some different situations for the circumstances in which the children used screen devices and found that three of four parents gave children a mobile device when doing chores and to keep them calm, 1of 4 to put children to sleep. This suggests that screen devices are used as "digital pacifiers" to distract children, and parents use the screen device as a means to manage children's behaviour, whereas older-aged children use the screen for recreation.

According to psychologist Aric Sigman, children exhibit screen-related addictive behaviour and cause symptoms like attention deficit disorder, weight gain, poor eyesight, headaches, poor nutrition, and, in young children, these side effects can be seen along with emotional symptoms like guilt, anxiety, and loneliness.[11] According to Claudette Avelino Tandoc, many children get irritable and agitated when disturbed from their activity on mobile devices and are prone to suffer mood swings.[11] Screen devices, mainly mobile phones, emit blue light, which puts a break on melatonin, causing sleep disturbances, headaches, and can even lead to visual defects.[12-14] Increased screen time also causes backache and other musculoskeletal discomfort.[14]

In the present study Morbidity pattern caused by the overuse of screen devices comprises Physical changes, including loss of appetite, overeating, weight loss, weight gain, vision problems, and headache. Social changes included changes in sleeping patterns and changes in attention span. Behavioural changes included anxiety, loneliness, mood swings, and anger, which was supported by findings of a study by Thakur et al,[15] noting that viewing television causes poor peer relationships and increases the risk for social isolation, anxiety disorder, agoraphobia, and antisocial behaviour, including aggression. Children with 2 or more hours of daily screen time are more likely to have increased psychological difficulties, including hyperactivity, emotional and conduct problems, difficulties with peers, and poor school performance.[16,17] Muppalla et al did a study on the effects of excessive screen time on child development and concluded that excessive screen usage can lead to problems in social-emotional development.[18] Nakshine et al concluded in their study that excessive screen time has a negative impact, like sleep deprivation, increased depression, and skipping school.[19] We also noted similar findings in our study.

In this era of screens, screens are not only in every home, but in almost every pocket. Spending a lot of time in front of a screen device in the early years of development can lead to increased screen time later in childhood, which can contribute to problems with peers and at school. Parents play a vital role in the impact of children's screen viewing; co-viewing with an adult can help make it an active process and facilitate learning from it.[20] Playing is essential for the development of social, cognitive, emotional, physical, and moral aspects. Children retain more of what they learn while playing, and play provides children the opportunities for different types of development - physical, social, emotional, intellectual, language, and skill development. So, parents need to be attentive and should engage their children in independent goal-oriented, high-quality quality and more focused play.[21]

5. Conclusion

To conclude, all screen and no outdoor play makes Jack an irritable, angry, and stout fellow. Screen device has negative effects on children's healthy development, including weight status, aggressive feelings, sleep disturbances, and social isolation. It also has potential for positive effects on child health, so we should find ways to optimize the role of screens in our society.

6. Recommendations

The American Academy of Paediatrics in 2016 recommended the following guidelines-[22]

1. For children younger than 18 months, avoid screens other than video-chatting. Parents of children 18 to 24 months of age should choose high-quality programming and watch it with their children to help them understand what they are seeing.
2. For children aged 2 to 5 years, limit screen time to 1 hour per day of high-quality programs. Parents should co-view media with children.
3. For children 6 years and older, place consistent limits on the screen time and the types of media, and the screen should not take the place of adequate sleep, physical activity, and other behaviours essential to health.
4. Designate screen-free time and screen-free locations at home, such as bedrooms.

In April 2019, WHO released guidelines which proposed that children under 2years should not be exposed to any screen time at all. Children aged 2 to 5years should also be limited to no more than an hour of sedentary screen time each day.[23]

So, parents should develop a family screen plan that considers the health, education, and entertainment needs of each child as well as the whole family. Parents of young children should watch the screen with their child to help children understand what they are seeing. Parents need to be educated about the negative effects of screens.

Paediatricians should encourage the development of screen literacy and should guide the parents on how to make a healthy screen environment for their children.

Parents should be fully informed about the content of the screen that their child is using, just in the way as parents know the ingredients in the food that their child is taking. Indian guidelines should be formulated and implemented to help parents and children to develop healthy screen habits.

We need to find ways to optimize the role of screens in our society, taking advantage of their positive attributes and minimizing the negative ones.

7. Limitation

The limitation of this study was, only patients coming to the outpatient department were enrolled. So, there is a need to replicate a similar study with a large sample size with multiple settings, i.e., both hospital and population-based. As the data was collected by the parents, they might not accurately remember the previous details, so the existence of recall bias cannot be nullified.

8. Source of Funding

None.

9. Conflict of Interest

None.

References

1. Grontved A, Hu FB. Television viewing and risk of type 2 diabetes, cardiovascular disease, and all-cause mortality: a meta-analysis. *JAMA*. 2011;305(23):2448–55.
2. Chonchaiya W, Pruksananonda C. Television viewing associates with delayed language development. *Acta Paediatr*. 2008;97(7):977–82.
3. Mendelsohn AL, Brockmeyer CA, Dreyer BP, Fierman AH, Berkule-Silberman SB, Tomopoulos S. Do verbal interactions with infants during electronic media exposure mitigate adverse impacts on their language development as toddlers? *Infant Child Dev*. 2010;19(6):577–93.
4. Verlinden M, Tiemeier H, Hudziak JJ, Jaddoe VWV, Raat H, Guxens M, et al. Television viewing and externalizing problems in preschool children: the Generation R Study. *Arch Pediatr Adolesc Med*. 2012;166(10):919–25.
5. Johnson JG, Cohen P, Smailes EM, Kasen S, Brook JS. Television viewing and aggressive behavior during adolescence and adulthood. *Science*. 2002;295(5564):2468–71.
6. Mendoza JA, Zimmerman FJ, Christakis DA. Television viewing, computer use, obesity, and adiposity in US preschool children. *Int J Behav Nutr Phys Act*. 2007;4:44.
7. Kabali HK, Irigoyen MM, Nunez-Davis R, Budacki JG, Mohanty SH, Leister KP, et al. Exposure and use of mobile media devices by young children. *Pediatrics*. 2015;136(6):1044–50.
8. Jago R, Baranowski T, Baranowski JC, Thompson D, Greaves KA. BMI from 3-6 y of age is predicted by TV viewing and physical activity, not diet. *Int J Obes (Lond)*. 2005;29(6):557–64.
9. Manganello JA, Taylor CA. Television exposure as a risk factor for aggressive behavior among 3-year-old children. *Arch Pediatr Adolesc Med*. 2009;163(11):1037–45.
10. Wiecha JL, Peterson KE, Ludwig DS, Kim J, Sobol A, Gortmaker SL. When children eat what they watch: impact of television viewing on dietary intake in youth. *Arch Pediatr Adolesc Med*. 2006;160(4):436–42.
11. TNN. Screen dependency disorder is real and it is damaging your child's brain! [Internet]. Times of India. 2018 [cited 2025 Sep 4]. Available from: https://timesofindia.indiatimes.com/life-style/health-fitness/photo-stories/screen-dependency-disorder-is-real-and-it-is-damaging-your-childs-brain/photostory/64598085.cms
12. Wang PY, Chen KL, Yang SY, Lin PH. Relationship of sleep quality, smartphone dependence, and health-related behaviors in female junior college students. *PLoS One*. 2019;14(4):e0214769.
13. Cajochen C, Frey S, Anders D, Späti J, Bues M, Pross A, et al. Evening exposure to a light-emitting diodes (LED)-backlit computer screen affects circadian physiology and cognitive performance. *J Appl Physiol (1985)*. 2011;110(5):1432–8.
14. Domoff SE, Borgen AL, Foley RP, Maffett A: Excessive use of mobile devices and children's physical health. Hum Behav&Emerg Tech 2019. 1:169-75. 10.1002/hbe2.145
15. Thakur Y, Khokhar C.P: Mass media and children. *Psycho-lingua.* 2001;31:135–8.
16. Page AS, Cooper AR, Griew P, Jago R. Children's screen viewing is related to psychological difficulties irrespective of physical activity. *Pediatrics*. 2010;126(5):e1011–7.
17. Johnson JG, Cohen P, Kasen S, Brook JS. Extensive television viewing and the development of attention and learning difficulties during adolescence. *Arch Pediatr Adolesc Med*. 2007;161(5):480-6.

18. Muppalla SK, Vuppalapati S, Pulliahgaru AR, Sreenivasulu H. Effects of excessive screen time on child development: an updated review and strategies for management. *Cureus*. 2023;15(6):e40608.
19. Nakshine VS, Thute P, Khatib MN, Sarkar B. Increased screen time as a cause of declining physical, psychological health, and sleep patterns: a literary review. *Cureus*. 2022;14(10):e30051.
20. Abrol U, Khan N, Shrivastva P. Role of parents in children's television viewing. *Childhood*. 1993;1(4):212–9.
21. Schmidt ME, Pempek TA, Kirkorian HL, Lund AF, Anderson DR. The effects of background television on the toy play behavior of very young children. *Child Dev*. 2008;79(4):1137–51.
22. AAP Council on Communications and Media. Media and young minds. *Pediatrics*. 2016;138(5):e20162591.
23. World Health Organization. Guidelines on physical activity, sedentary behaviour and sleep for children under 5 years of age [Internet]. Geneva: World Health Organization; 2019. Available from: https://iris.who.int/handle/10665/311664.

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