



International Journal of Research In Paediatric Nursing

E-ISSN: 2664-1305
P-ISSN: 2664-1291
www.paediatricnursing.net
IJRPN 2024; 6(1): 43-47
Received: 26-12-2023
Accepted: 21-01-2024

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A study to assess the awareness regarding digital eye strain among mothers of children visiting a selected hospital, Bangalore

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DOI: <https://doi.org/10.33545/26641291.2024.v6.i1a.153>

Abstract

Background: Digital eye strain is a group of eye and vision related problems that results from prolonged usage of computers, tablets, e-readers, and cell phones. It also describes the inclusion of ocular, visual and musculoskeletal symptoms due to prolonged use of computers. Globally 60 million people using digital devices suffer from digital eye strain and an estimated 1 million each New Year. Prevalence of digital eye strain ranging from 5 to 65% has been reported in the pre COVID-19 era. With lockdown restrictions during the pandemic, outdoor activities were restricted for all age groups, and digital learning became the norm for almost 2 years. While the digital eye strain prevalence amongst children alone rose to 50 to 60%, the symptoms expanded to include recent onset esotropia and vengeance abnormalities as part of the digital eye strain spectrum.

Methodology: The research design selected to the study was descriptive cross-sectional study. The study was conducted among the mothers of children aged between 5 to 18 years visiting paediatrics OPD of SJMCH, Bangalore. A total 74 mothers were recruited using non-probability purposive sampling technique. A self-structured questionnaire was used to assess the awareness of digital eye strain among mothers. The data was analysed using descriptive and inferential statistics.

Results: The findings showed that out of 74 mothers, 63.5% of mothers have inadequate awareness, 33.8% have moderately adequate awareness and 2.7% have adequate awareness. There was a significant association between awareness regarding digital eye strain and baseline variable age of mothers. And other baseline variables like educational status, occupation, type of family, family income, number of children, age of children, use of digital devices and duration has no significant association with awareness.

Conclusion: The present study focuses on awareness regarding digital eye strain among mothers of children. The implications are given for various aspects like nursing practice, nursing administration, nursing education and nursing research. The study shows that out of 74 samples, the majority of them had an inadequate awareness regarding digital eye strain. This result emphasises that an improvement in awareness can help in better outcomes.

Keywords: Digital eye strain, awareness, digital eye, frequent discomfort, information faster

Introduction

Computer, smartphones and tablets have become an important source in our day to day life as they provide a convenient means to seek access and share information faster. Digital Eye Strain (DES) is characterised by a range of visual and musculoskeletal problems that results from prolonged use of digital devices and has been recognized as a health problem for over 20 years^[1]. The terms visual fatigue (VF) and computer vision syndrome (CVS) are also used for this condition. Given the massive growth in digital device usage in recent years, many millions of individuals of all ages are at risk of digital eye strain. While symptoms are usually transient, the condition can cause significant, frequent discomfort for sufferers^[2].

Numerous people experience visual uneasiness and vision related issues while using computerised gadgets for extensive stretches. This may be because of poor lighting, poor posture, glare on the screen, continuous usage without appropriate break and uncorrected vision. The serious level of inconvenience depends upon the hours of computer screen use. Many studies suggest that the following factors are associated with digital eye strain: uncorrected refractive error (Including presbyopia), accommodative anomalies, altered blinking pattern (Reduced rate and incomplete blinking), excessive exposure to intense light, closer working distance, and smaller font size^[3].

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Double vision, Eye fatigue, migraine, blurred vision, watery eyes, dry eyes, neck and shoulder torment are the most well-known indications. Since a symptom may be caused by one or more factors, a holistic approach should be adopted. Prevention is the main strategy for management of digital eye strain, which involves: (i) ensuring an ergonomic work environment and practice and (ii) visual examination and eye care to treat visual disorders. Special consideration is needed for people at a high risk of digital eye strain, such as computer workers and contact lens wearers [4].

Management options for digital eye strain include following correct ergonomics like reducing average daily screen time, frequent blinking, improving lighting, minimizing glare, taking regular breaks from the screen, changing focus to distance object intermittently, and following the 20-20-20 rule to reduce eye strain. Innovations in this field include high-resolution screens, inbuilt anti-reflective coating, matte-finished glass, edge-to-edge displays, and image smoothing graphic effects. Further explorations should focus on recommendations for digital screen optimization, novel spectacle lens technologies, and inbuilt filters to optimize visual comfort [5]. There is a strong need to create awareness on digital eye strain among mothers to update their knowledge on digital eye strain and its prevention, so that, we can minimize the use of e-gadgets by children and ensure safe use of e-gadgets with more precautions to safeguard the children from digital eye strain.

Objectives

- To assess the awareness of mothers regarding digital eye strain.
- To determine the association between the awareness of mothers on digital eye strain with the selected demographic variables.

Research Hypothesis

H1: There will be a significant association between awareness regarding digital eye strain among mothers of children and selected variables at 0.05 level of significance.

Methodology

Research Approach: Quantitative research approach

Research Design: Descriptive study design.

Sampling technique: Non-Probability Purposive Sampling

Sample size: 74 samples

Setting of the study: Paediatric Outpatient Department of St John's Medical College Hospital, Bangalore

Tool used for data collection: Following tools used for the data collection.

Section 1: Proforma to elicit baseline variables: It consists of 9 items related to demographic data of participants and their children.

Section 2: Self structured questionnaire to assess the awareness of mothers regarding digital eye strain: It consists of 24 questions

Procedure

Data will be collected after obtaining formal permission from the concerned authority and the Institutional Ethical Committee (IEC) clearance. A descriptive cross-sectional research design will be adopted for this study. The subject will be identified based on inclusion and exclusion criteria using non-probability purposive sampling technique. The purpose of the study will be explained to the subjects and written consent will be taken. By conducting interview, demographic variables will be collected by using baseline proforma. In this study demographic variables refers to the age, education, occupation, family income, type of family, number of children, age of children, name of gadgets they are using and how long per day are the using. After which the awareness of mothers regarding digital eye strain will be obtained by interview method using self-structured questionnaire consisting of 24 questions including the areas like causes, symptoms, prevention and management which require total of 20-30 minutes. Statistical analysis will be done by SPSS. Description of the subjects with respect to baseline variables will be presented using frequency and percentage. Mean, mean percentage, standard deviation will be used to describe the awareness of mothers regarding digital eye strain. Association will be analyzed by using chi-square, t-test or ANOVA test.

Results

The findings related to baseline variables of mothers

Section 3: Findings related to association of awareness with selected baseline variables.

Table 1: Frequency and percentage distribution of baseline variables of mothers. n=74

SL. No	Variables	Frequency[n]	Percentage [%]
1	Age of mothers in years		
	25-37	55	74.3
	38-50	19	25.7
2	Education of mothers		
	Primary school	1	1.7
	Middle school	4	5.4
	High school	17	23
	Post high school	15	20.3
	Graduate	23	31.1
3	Occupation of mothers		
	Semiskilled	54	73
	Skilled	5	6.8
	Semi-profession	3	4
	Profession	12	16.2
4	Family income		
	<=9226	5	6.8
	9232-27, 648	32	43.2

	27, 6524-46, 089	13	17.6
	46, 095-68, 961	11	14.9
	68, 967-92, 185	3	4.1
	92, 191-1, 84, 370	5	6.8
	>=1, 84, 376	5	6.8
	Type of family		
5	Nuclear family	21	28.4
	Joint family	53	71.6
	Number of children		
6	1	23	31.1
	2	45	60.8
	3	5	6.8
	4	1	1.4
	Age of children		
7	Pre-schooler	15	20.3
	Schooler	42	56.8
	Adolescent	17	23
	Use of gadget		
8	Yes	72	97.3
	No	2	2.7
	Duration of Gadgets used		
9	Less than 1 hr	6	8.1
	1-2hrs	29	39.2
	2-3hrs	22	29.7
	3-4hrs	14	18.9
	4-5hrs	2	2.7
	More than 5 hrs	1	1.4
	Type of devices used		
10	Mobile phone	40	54.1
	Tablet	3	4.1
	Computer	7	9.5
	Television	24	32.4

b. The findings related to awareness of mothers regarding digital eye strain

Table 2: Range, Mean and Standard deviation of awareness of mothers. n=74

Awareness	Maximum Score	Range	Mean	Standard deviation
	24	3 -19	10.74	4.188

Table 2 reveals that, maximum score was 24 with range of 3-19. Mean is 10.74 with standard deviation is 4.188

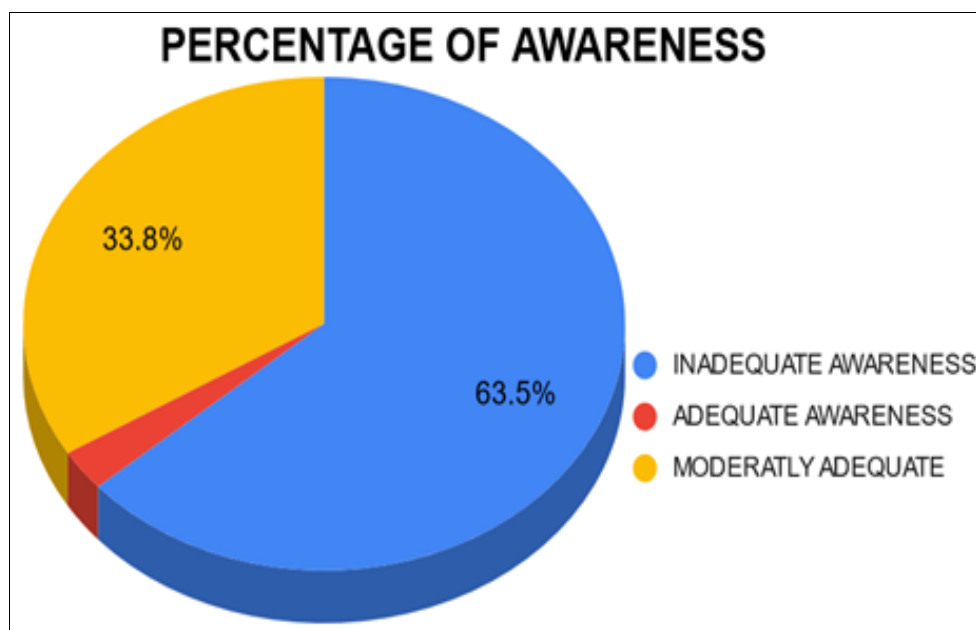


Fig 1: Awareness regarding digital eye strain among mothers

The above figure shows the majority of the respondents (63.5%) had inadequate awareness regarding digital eye strain.

Section 3: The findings related to association between awareness and selected baseline variables.

Table 3: Frequency, percentage, Fischer’s exact value of association of awareness with baseline variables

SL. No	Baseline data	Awareness						Fischer's exact value	P-Value
		Adequate		Moderately adequate		Inadequate			
		Frequency	%	Frequency	%	Frequency	%		
1	Age of mothers								
	25-37	0	0.0%	19	76.0%	36	76.6%	5.95	0.051 S
	38-50	2	100.0%	6	24.0%	11	23.4%		
2	Education								
	Primary education	0	0.0%	0	0.0%	1	2.1%	14.9	0.184 NS
	Middle school	0	0.0%	0	0.0%	4	8.5%		
	High school	0	0.0%	6	24.0%	11	23.4%		
	Post high school	0	0.0%	3	12.0%	12	25.5%		
	Graduate	0	0.0%	10	40.0%	13	27.7%		
	Professionals	2	100.0%	6	24.0%	6	12.8%		
3	Occupation								
	Semi-skilled	0	0.0%	16	64.0%	38	80.9%	13.6	0.062 NS
	Skilled	0	0.0%	2	8.0%	3	6.4%		
	Semi professional	0	0.0%	2	8.0%	1	2.1%		
	Professional	2	100.0%	5	20.0%	5	10.6%		
4	Type of family								
	Nuclear family	2	100.0%	16	64.0%	34	72.3%	3.08	0.78 NS
	Joint family	0	0.0%	9	36.0%	11	23.4%		
5	No: of children								
	1 Child	1	50.0%	8	32.0%	14	29.8%	10.9	0.074 NS
	2 Child	0	0.0%	16	64.0%	29	61.7%		
	3 Child	1	50.0%	0	0.0%	4	8.5%		
	4 Child	0	0.0%	1	4.0%	0	0.0%		
6	Age of children								
	5 – 6 years	0	0.0%	7	28.0%	8	17.0%	2.84	0.726 NS
	7 – 12 years	2	100.0%	13	52.0%	27	57.0%		
	13 – 18 years	0	0.0%	5	20.0%	12	25.5%		
7	Use of gadgets								
	No	1	0.0%	1	4.0%	1	2.1%	0.275	1 NS
	Yes	2	100.0%	24	96.0%	46	97.9%		
8	Duration of gadget used								
	Less than 1 hour	0	0.0%	2	8.0%	4	8.5%	10.4	0.353 NS
	1 – 2 hours	0	0.0%	12	48.0%	17	36.2%		
	2 – 3 hours	2	100.0%	4	16.0%	16	34.0%		
	3 – 4 hours	0	0.0%	7	28.0%	7	14.9%		
	4 – 5 hours	0	0.0%	0	0.0%	2	4.3%		
	More than 5 hours	0	0.0%	0	0.0%	1	2.1%		
9	Type of device used								
	Mobile phone	1	50.0%	14	56.0%	25	53.2%	2.35	0.88 NS
	Tablet	0	0.0%	0	0.0%	3	6.4%		
	Computer	0	0.0%	3	12.0%	4	8.5%		
	Television	1	50.0%	8	32.0%	15	31.9%		

Table shows that there was an association between the age of mothers and awareness with the p value of 0.051 level of significance.

Discussion

The results revealed that 74.3% of mothers belong to the age group 25-37 years, 25.7% of them belong to 38-50 years. 1.4% of them completed their primary school, 5.4% completed middle school, 23% completed high school, 20.3% completed their post high school, 31.1% of them were graduates, 18.9% of them were professionals. 73% of them were semiskilled, 6.8% were skilled, 4.1% were semi-professional, 16.2% were professional.70.3% belong to nuclear family, 27% belong to joint family, 31.1% of mothers having 1 child, 60.8% were having 2 child, 6.8% were having 3 child, 1.4% were having 4 child. 6.8% of the mothers had income of >/=1, 84, 376, 9232-27, 648 and, </=9226, 43.2% had income between 92, 191-1, 84370,

17.6% of them between 68, 967-92, 185, 14.9% had income between 46, 095-68, 961, 4.4% had income between 27, 654-46, 089. 20.3% of children were in the age between 5-6 years, 56.8% were in the age group between 7-12 years 23% were in 13-18 years. 97.3% of children were using digital devices, 2.7% were not using digital device. Among them 54.1% were using mobile phones, 4.1% were using tablet, 9.5% were using computers, 32.4% were using television.8.1% of children were using digital devices less than 1 hour, 39.2% were using 2 hour, 29.7% were using 2-3 hours, 18.9% were using 3-4 hours, 2.7% were using 4-5 hours, 1.4% were using more than 5 hours.

The study showed that 63.5% of mothers were having inadequate awareness, 33.8% were having moderate awareness, 2.7% were having adequate awareness regarding digital eye strain.

There is significant association between age of mother and awareness of mothers regarding digital eye strain. At 0.05

level of significance.

The results serve as a database for the future study. The study suggested that the majority of mothers were having inadequate awareness [63.5%] regarding digital eye strain. In the questionnaire 23.9% of mothers were aware about the term digital eye strain, 27.7% of mothers were aware about its causes, 26.8% were aware about the symptoms and 21.6% were aware about the prevention and management of digital eye strain.

Conclusion

The findings of the study proved that the majority of mothers were having inadequate awareness regarding digital eye strain. This results also stressed the need for introducing educational programs to the parents and children to prevent the incidence of digital eye strain among children.

Acknowledgement

I praise and thank God Almighty for his abundant grace and blessings that he has showered upon us throughout our study. I offer our sincere appreciation and deep sense of gratitude to all who helped us in accomplishing this task successfully. I extend our sincere gratitude to Dr. Chitra Dinakar, H.O.D, Department of Paediatric Medicine for her valuable guidance and support. I express our deep sense of gratitude and respect to Mrs. Susan Kumar, H.O.D, Department of Medical Surgical Nursing for her timely guidance, valuable suggestions and support during every step of the study.

Conflict of Interest:

Not available

Financial Support:

Not available

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How to Cite This Article

Stains S, Kumar S. A study to assess the awareness regarding digital eye strain among mothers of children visiting a selected hospital, Bangalore. *International Journal of Research in Paediatric Nursing* 2024; 6(1): xx-xx.

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