Prevalence and Determinants of Screen-Viewing in Children Under Two Years in Suva, Fiji

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Note: This early-online version of the article is an unedited manuscript that has been accepted for publication. It has been posted to the website for making it available to readers, ahead of its publication in print. This version will undergo copy-editing, typesetting, and proofreading, before final publication; and the text may undergo minor changes in the final version.

ABSTRACT

Objective: To determine the prevalence of screen-viewing and factors affecting this behavior among children aged less than two years in Suva, Fiji. **Methods:** This cross-sectional study was conducted at three randomly selected maternal and child health (MCH) clinics among parents or accompanying guardians of 379 children. Data collection was carried out using a 20-item self-administrated questionnaire. **Results:** The prevalence of screen viewing in children was 66.2%. Screen viewing was more prevalent in children aged 12-24 months (89%) than in children below 12 months (57%). The risk of screen-viewing was high among those who had parents as daytime caregivers [RR (95% CI) = 0.93 (0.82 - 1.04), *P*=0.001], iTaukei RR (95% CI) = 0.79 (0.71 – 0.87), *P*=0.001), and children younger than 12 months (RR (95% CI) = 0.64 (0.57 - 0.71), *P*=0.001). Results show that availability of screen devices at home is significantly related to children's screen viewing [RR (95% CI) =1.03 (0.64 – 1.65), *P*=0.03]. **Conclusion:** The study found early exposure and early adaptation to screen viewing in children due to several determinants, and suggest need for anticipatory guidance to parents.
Keywords: *Caregiver, Obesity, Screen time*.

The screen device, is a major part of the contemporary life for children [1]. Now, more than ever, children from a very young age are allowed unlimited access to a wide variety of screen devices, and the prevalence is increasing [1-4]. Excessive screen-viewing has been linked to several pediatric health determinants and outcomes [5-6], and various risk factors for this behavior [2-3,7,8]. It is important to be cautious about screen viewing by children below two years as they are in a critical developmental period of their life.

In Fiji, there are 213 004 children aged younger than five years and of these 91 830 are from the Suva sub-division [9]. The aim of this study was to determine the prevalence of screen-viewing, and analyze the associated factors among children under two years in Suva.

METHODS

A cross-sectional study was conducted at three maternal and child health (MCH) clinics, randomly selected from the eight designated MCH clinics in the Suva subdivision. These included the Nuffield, Valelevu and Makoi MCH clinic. We enrolled caregivers who brought at least one child younger than two years to the clinics, and who were living in Suva for more than one year and attending the three MCH clinics during the study period.

The total population of children younger than two years was obtained from the Expanded Program on Immunization (EPI) monitoring registers of the three MCH clinics. The total population of registered children less than two years at the three clinics was found to be 5832. A proportional sampling method was then used to calculate the sample size using a 5% margin of error and 95%CI of parents or accompanying guardians of children aged less than two years at the three selected clinics. Considering a 5% non-response rate, the total sample size for this study was 379.

A 20-item questionnaire was administered directly by the researcher. The questionnaire included a set of standardized questions that included demographic characteristics (age, place of recruitment, childbirth order, number of children, ethnicity and daytime caregiver arrangement), and the screen viewing behaviors (watching/ engaging with screens for some time) of the children. Pilot testing was done at the Makoi and Nuffield MCH clinics with a sample of eight volunteer participants who met the inclusion criteria of the study ensuring that the questionnaire was readable and understandable by participants. It was also tested by the study supervisors to validate content of the tool. Following the pre-test, minor changes were made to the questions and structure of the data collection tools.

The outcome variable for this study was infant/toddler screen time, which was defined as the time spent watching screens such as television, DVDs, videos, smartphones, tablets or computers by children below the age of 2 years. Additional variables such as socio-demographic characteristics were studied as confounders to explore relationship with the main predictor (screen time). This included childbirth order, age of child (months), ethnicity, daytime caregiver arrangements, child's screen time, frequency of screen viewing and availability of screen devices.

Data collection was done from 1 March to 30 September, 2019. The researcher organized an initial meeting with the Sub-Divisional Medical Officer (SDMO) and sister-in-charge of the three MCH clinics. A week earlier than the actual data collection, an awareness meeting was also done with the medical officer, sister-in-charge and zone nurses of the MCH clinics to highlight the importance of this study and the support needed from the clinics.

During the data collection period, the participants at each MCH clinics were invited to respond to an anonymous, one-on-one questionnaire administered by the researcher, while waiting to see the healthcare providers at the clinics. With support of the MCH nurse on duty, an announcement about the study was done to all waiting participants in the three major languages, English, Hindi and *iTaukei*. In the announcement, information about the survey was shared and an open invitation made to potential participants to be part of the study. Recruitment of participants was done by the researcher. Participants who brought more than one eligible child to the clinic completed the questionnaire only for the youngest child. For those who volunteered to participate, a next round of one-on-one information was provided. Participants provided informed verbal and written consent prior to taking part in the study. Questionnaires were filled in by the researcher with each participant at a designated confidential space within the MCH clinic. Translation of the questionnaire was done in Hindi and *iTaukei* depending on the need of participants. In cases where both parents were present, both were included when filling the questionnaire and it was left to the parents to decide who took the lead in answering.

Data analysis: Data was entered in KoBo Toolbox for data cleaning and coding and then transferred to Microsoft Excel for further analysis. Data was analysed using descriptive statistics. Chi square test was used for categorical variables to assess the relationship between risk factors and screen viewing. A *P* value less than 0.05 was considered statistically significant.

RESULTS

A total of 361 participants (88.9% response rate) answered the questionnaire completely and were included in the analysis. The study participants responding were predominantly female (82%). Majority (69.8%) of children were younger than 12 months of age, and were the youngest child (53.5%) in birthorder (**Table I**).

The prevalence of screen viewing in under two-year-olds was found to be 66.2%; higher in 12-24 months (89.9%) than in children below 12 months (57.1%). Most children (33.4%) used screens several times a week, regardless of age while 27.5% watched screens several times a day; 6.3% watched screens once a day. Most children (59%) spent less than 2 hours per day as screen time, while 41% spent 2 or more hours on screen time per day. Television was the most popular form of screen viewing, followed by smartphones. The main reasons given for children's screen time use were: used as a distraction tool (29.9%); to calm child or to prevent negative behavior (26%); and educational use (22%). Other reasons given for children's screen use were as part of family time, and used for the toddler to rest. Majority of children (98.1%) had screen devices at home, and it was significantly related to children's screen viewing [RR (95% CI) = 1.03 (0.64 – 1.65); *P*=0.03]. The most common devise used for screen viewing activity were either television (51%) smartphones (45%).

Frequency of screen viewing was high among first-borns (76.6%) (P=0.03), in children who had nannies as daytime caregivers (95%) (*P*=0.01) and in Fijians of Indian descent (80.3%) (P=0,002). The factors associated with screen-viewing are shown in **Table II**.

DISCUSSION

This study found that prevalence of screen viewing is high (66.2%) and that children are spending a substantial amount of time in front of screens. This was consistent with previous research [5, 10, 11, 12], with around 40% of children under two years watching more than two hours of television per day [10,11]. This study also found that screen viewing is more prevalent in children 12-24 months, similar to results of the study by Barber et al., (2017) that also showed that child TV time increased with age in a non-linear way [13]. The findings are consistent with another study, which found that most children start using mobile devices in their first year of life [14].

The main screen device as highlighted by the study included television and smartphones. These findings were consistent with the findings of a previous study in Philadelphia [14]. Children were more likely to view screens when under care of grandparents than with parents. An association was also found between the major ethnic groups and screen viewing, similar to a previous report in 2-3-year-olds [15]. This association with ethnicity implies that culturally specific interventions may be required to address the screen viewing issue.

Results of this study cannot be generalized to all children in Fiji as the diversity of the study in terms of ethnicity was not fully proportional and representative, as *iTaukei* were over-represented. The baseline demographical information did not show equal representation of sample in terms of age and ethnicity.

Prevalence of screen viewing is high in children aged less than two years in Suva, Fiji. The high prevalence rate of screen viewing in children below two is a concern given the WHO recommendation of no screen time for children below two years. More research is necessary on the types of interventions that can mitigate the effects of screen exposure in children's development. Anticipatory guidance and alternatives to screen viewing activity that support positive development should be made available to families attending pediatric practices and MCH clinics in Fiji.

Ethics clearance: The ethic approval was obtained from the College Health Research Ethics Committee (CHREC) in Fiji National University and the Ministry of Health and Medical Service's National Health and Research Ethics Committee.

Contributors: ND: designed the study, collected and analyzed the data. MM, AT: helped design reviewing, and supervise the research study. All authors contributed to writing and revising the manuscript in addition to reading and approving the final version.

Funding: None; *Competing interest*: None stated.

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WHAT THIS STUDY ADDS?

- The prevalence of screen-viewing in children younger than 2 years was 66.2% in Suva, Fiji.

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Table I Demographic Characteristics of Study Participants (*n*=361)

Characteristic	No (%)
Place of recruitment	
Makoi MCH clinic	136 (38)
Nuffield MCH clinic	124 (34)
Valelevu MCH clinic	101 (28)
Child age	
< 12 mo	252 (69.8)
12 - 24 mo	109 (30.2)
Childbirth order (n=355)	
Youngest child	190 (53.5)
First born	154 (43.4)
Middle child	11 (3.1)
Daytime caregiver arrangement (n=355)	
Parents	252 (71.0)
Grandparents	72 (20.3)
Nannies	20 (5.6)
Home-based caregiver	11 (3.1)
No. of children at home (n=358)	
1	109 (30.4)
2	126 (35.2)
> 2	123 (34.4)
Ethnicity	
iTaukei	267 (74.0)
Fijian of Indian descent	76 (21.1)
Others	18 (5.0)

Table II Factors Associated with Screen-Viewing in Children (Aged<2 years) in Fiji

Factors	Screen viewing	RR (95%CI)
Parent as major caregiver (*n*=252)	160 (63.5)	0.93 (0.82 - 1.04)
Ethnic group		
iTaukei[a,b]	167 (63.7)	0.79 (0.71 – 0.87)
Fijian of Indian decent	61 (80.3)	
Age <12 mo[a]	144 (57.1)	0.64 (0.57 - 0.71)

Values in no. (%). [a]P=0.001, [b]Compared to Fijian of Indian decent