Screen Viewing Behaviour among Children under 2 Years in Fiji: Reasons and the Perceptions of Parents/Caregivers

Nileshni Devi[1], Masoud Mohammadnezhad[1] & Amelia Turagabeci[1]

[1] School of Public Health and Primary Care, Fiji National University, Suva, Fiji

Correspondence: Masoud Mohammadnezhad, Associate Professor in Public health (Health Promotion), School of Public Health and Primary Care, Fiji National University, Fiji. E-mail: masoud.m@hotmail.com

Abstract

Background: Screen-viewing among children has become a growing public health concern. There is no existing research done in Fiji on children's screen viewing behaviour, therefore, this study aimed to determine the reasons and the perceptions of parents/caregivers in affecting screen viewing behaviour among children under 2 years in Suva Fiji.

Materials and Methods: This cross-sectional mixed method study was conducted at three randomly selected Maternal Child Health (MCH) clinics among parents or accompanying guardians of children under two years old. Using proportional sampling, 361 participants who met the study criteria participated in this study. Data collection was carried out using a 20-item self-administrated questionnaire for quantitative study and a semi-structured open-ended questionnaire for the qualitative study through two Focus Group Discussions (FGDs). Descriptive analysis was used for quantitative data and thematic analysis was applied for the qualitative data to emerge themes.

Results: Most children (32.8%) watched screens several times in a week, regardless of age. The main reason for children's screen time is that it is a distraction tool (29.9%) followed closely by using it to calm child or to prevent negative behaviour (26%) and education (22%). The study found that most of the parents/ caregivers know that there are negative consequences of screen time on their children. Majority of these parents/ caregivers (66%) however think that the only effect is that related to children's eye health and are unaware of the other health consequences. About 24% think that there is no negative effect at all on children engaged in screen viewing. The study also found that more than half (56%) of the parents (or caregiver guardians) think that screen viewing below the age of 2 years actually has positive consequences on children. Of these the vast majority (76.7%) think that screen viewing makes their children smart/ helps them to learn from a very young age.

Conclusion: The findings of this study highlighted the main reasons of screen viewing among children under 2 years.

Keywords: Screen viewing, parental/caregiver perception, children below 2 years, Fiji

1. Introduction

Screen-viewing among children remains a global public health concern (Stiglic & Viner, 2019; Vanderloo, 2014). Today, discretionary screen time, often involving multiple devices such as television, smart phones and tablets, is the single main experience and environment of children (Vanderloo, 2014; Sigman, 2014). 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 (Stiglic & Viner, 2019; Vanderloo, 2014; Sigman 2014; Segev et al., 2015). Child development experts recommend limiting children's daily screen time. This is because real-life interactions with parents and others are much better for the child's wellbeing, learning and development (Sigman, 2014; Segev et al., 2015).

Mounting evidence has shown that many children start using screen media in infancy and increase their media use through infancy (Domingues-Montanari, 2017; Duch et al., 2013; Heelan & Eisenmann, 2006; Rideout et al., 2010; Cox et al., 2010). Excessive screen-viewing has been linked to several paediatric health determinants and outcomes (Hinkley et al., 2012; Sigman, 2017; WHO, 2019), and with several risk factors that affect this behaviour (Vanderloo, 2014; Sigman, 2017; Moon et al., 2014; Mark, 2008; Xianhua-Wu, 2013). Screen time is associated with obesity mainly through the displacement of time available for physical activity and more directly through reduction in metabolic rate (Domingues-Montanari, 2017). There is also evidence that high screen time is

associated with deleterious effects on irritability, low mood and cognitive and socioemotional development, as well as speech and language development delays (Domingues-Montanari, 2017; Duch et al., 2013; van den Heuvel, 2019).

The recognition that early childhood years play a fundamental role in the development of health-related behaviours, coupled with concerns about young people's screen time, have prompted various countries to issue guidelines on screen time for children. Currently Canada and Australia recommend no screen time exposure for children under two years old and less than an hour a day for 2–5-year-olds (Canadian Paediatric Society and Australian Government Department of Health). The American Academy of Paediatrics recommends a maximum of one-hour screen time a day for children aged 2 to 5 years old. Babies below 18 months should not be given access to screens (Sigman, 2017). The World Health Organization (WHO) recommends that children younger than a year should not be exposed to any electronic screens. It also recommends that children of ages two to four have no more than one hour per day of sedentary screen time including playing computer games or watching television (WHO, 2019).

Children are allowed screen time for various reasons, from keeping them entertained to ensuring they are well behaved, using it as a reward or punishment (Xianhua-Wu, 2013; Bentley et al., 2016). Parents and caregivers can mediate children's access to and use of screen devices. In Fiji, 213,004 children age less than 5 years and of these 91,830 are from the Suva sub-division (Fiji MoHMS, 2021). The engagement in screen viewing by children of this age range is highly obvious in Suva however, there has been no study conducted locally on-screen viewing behaviour of children. This study therefore aimed to find the reasons for screen viewing and to analyse the role of parental relationship in affecting this behaviour among children under 2 years in Suva, Fiji. Findings from this study will help to fill a gap in literature at a local level and bring to attention the public health concern for young children not often talked about in Fiji or in the Pacific.

2. Materials & Methods

2.1 Study Design and Setting

A mixed method study was conducted including both qualitative and quantitative techniques of data collection and both types of data were collected at the same time and integrated. Three Maternal and Child Health (MCH) clinics were randomly selected from the eight designated MCH clinics in the Suva subdivision, Suva, Fiji. These included the Nuffield, Valelevu and Makoi MCH clinic.

2.2 Study Sample

This study included the parents, grandparents, guardians or caregivers who brought at least one child aged less than 2 years, child was living in Suva and attended the three MCH clinics during the study period. Those who were not willing or able to participate in this study were excluded.

In-order to get the actual participants for the research, a purposive sampling was used and the total population of children less than 2 years was obtained from the Expanded Programme on Immunisation (EPI) monitoring registers of the 3 MCH clinics. The EPI monitoring register keeps records of children's personal details, growth and immunisation and nutritional data, and milestones for each child. The total population of registered children under 2 years at the 3 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% Confidence Interval (95% CI) of parents or accompanying guardian of children aged less than 2 years at the 3 selected MCH clinics in the Suva subdivision. After adding 18 as 5% non-respondent rate, the total sample size for this study was 361.

2.3 Data Collection Tools

A 20-item structured questionnaire was used to collect quantitative data. The structured questionnaire included a set of standardized questions that explored the screen viewing behaviours of children aged less than 2 years. The questionnaire had two sections. The first section included 7 demographic questions to identify characteristics such as age of child, sex of respondent parent, place of recruitment, childbirth order, number of children, ethnicity and daytime care giver arrangement while the second section focussed on screen viewing behaviour. In the second section there were various styles of questioning used including two Yes/ No questions, which asked whether the participant thought there was any negative consequence of screen time on the child and whether the participant thought there was any positive consequence of screen time on the child, 9 multiple choice questions were used mainly to measure frequency of child's screen time, number of apps downloaded for the child, child's ability with mobile devices and so forth and there was one rating scale question which sought to determine child's age at first use.

For the qualitative study, a semi-structured open-ended questionnaire was used to collect data through Focus

Group Discussion (FGD). There were 8 questions with some probing questions asked as needed to facilitate discussions. The researcher also took note of important demographics for example the date/ time of FGD, number of participants, sex of participants, venue. A non-directive style of interviewing using open-ended questions was used allowing the participants some freedom to control pacing and subject matter of the interview, while a more directive style of questioning was used to get more clarification of information that the participants will be providing.

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 two experts 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 main predictor variable for this study was infant/ toddler screen time. Additional variables were studied to explore relationship with the main predictor (screen time). This included frequency of screen viewing, reasons, use of software applications, and consequences as perceived by parents/ caregivers.

2.4 Data Collection Procedure

Data collection happened between 1st March and 30th September 2019. The main researcher organised 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, prior awareness 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. This was also an opportunity to discuss in detail plans for data collection and obtain the total number of children younger than two years on record at the clinics.

During the data collection period, the main researcher travelled to the MCH clinics to fill in the questionnaires with each participant. Participants were invited to an anonymous, one-on-one questionnaire administered by the researcher while waiting to see the health care providers at the clinics. With support of a 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. Translations 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.

For qualitative data, two FGDs were held with 11 participants with 5 – 6 participants in each FGD. Existing subjects that were known to the main researcher (from the quantitative survey), recruited other subjects in their area who met the inclusion criteria to be part of FGDs. Information about the FGD were shared with all participants at least 3 days in advance via phone calls or personal visits. Their confirmation for participation was sought via follow up phone calls. As and where needed, travel arrangements for participants was done by the main researcher, which included buses and taxis. Additional support with regards to childcare and toys/ activities children can engage was organised while parents were attending to FGDs. The main researcher conducted the FGDs and a note taker was assigned to help with note taking. Each FGD was a maximum of one hour followed by a light refreshment, and held at a designated common place in the community. The entire program finished within 90 minutes so that parents could return home in time for childcare and other duties. After 2 FGDs theoretical data saturation was reached. Facilitation was a crucial element of the FGDs. Particular consideration was given to ensure even participation, careful wording of the key questions, and maintaining a neutral attitude and appearance. Sessions were summarised to reflect the opinions evenly and fairly.

All possible safeguards were used to protect participants' rights. Participants were advised of the voluntary nature of their participation and that they could withdraw from the study at any time. Information sheet was given, and written consent sought during both qualitative and quantitative data collections.

2.5 Data Management and Analysis

For the quantitative data, data was entered to the KoBo Toolbox for data cleaning and coding and then transferred to Microsoft Excel for further analysis using the Excel's Analysis Toolpac feature. Data was analysed using descriptive statistics. Chi square test was used for categorical variables to assess the relationship between risk

factors and screen viewing.

For qualitative data, the first step was to transcribe all the data. The raw data was largely unstructured or sometimes made no sense. Hence the first step converted all data into textual form. The collected data was then organised according to the research objectives or questions in a visually clear way. This was achieved using tables. The research objectives were input into the table and data was assigned according to each objective. Categories were then generated noting patterns in the data, relating to the topics described by interviewees. A manual thematic analysis was used (19) data analysing was done based on a structure predetermined by the researcher. The research question was used as a guide for grouping and analysing data. While analysis of raw data was done from FGDs to form categories or themes, the researcher had setup some codes already and defined them according to the source (e.g. literature review). However, when some coded segments of the text do not fit the categorization matrix, it was possible for new categories to be created.

2.6 Ethical Considerations

Upon receiving the necessary ethical approval from the Fiji National University's (FNU) College Health Research Ethics Committee (CHREC) and from the Fiji National Health and Research Ethics Committee (FNHREC), the researcher sought a written approval from the Sub-Divisional Medical Officer (SDMO), Fiji Ministry of Health and Medical Services (MoHMSs) to carry out the research work at the three MCH clinics in Suva. Informed consent was taken from all participants in the study.

3. Results

3.1 General Characteristics of Participants

A total of 361 participants (with the response rate of 89%) answered the questionnaire completely or were part of focus group discussions. The study participants responding were predominantly female (82%). Majority of children (69.8%) were younger than 12 months of age and was the youngest child (53.5%) when it came to childbirth order. Daytime caregiver arrangement was predominantly parents (71%), and ethnicity was predominantly *iTaukei* (74%). The total number of children at home was quite uniformly distributed (Table 1).

Table 1. Demographic characteristics of study participants (n=361)

Variables	*Frequency (n)*	Percentage (%)
Place of recruitment		
Makoi MCH clinic	136	38
Nuffield MCH clinic	124	34
Valelevu MCH clinic	101	28
Child age		
< 12 months	252	69.8
≥12 -> 24 months	109	30.2
Participants' sex		
Male	32	13
Female	308	82
Male and female	21	5
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
Grandparents	72	20.3
Nannies	20	5.6
Home-based caregiver	11	3.1

Total number of children at home (n=358)		
1	109	30.4
2	126	35.2
> 2	123	34.4
Ethnicity		
iTaukei	267	74
Fijian of Indian descent	76	21.1
Others	18	5

3.2 Frequency and Reasons of Screen Viewing

As Table 2 shows, most parents/ caregivers let their children watch television or smart phones (or other screen devices) sometimes (37.7%) and often (20.8%) when out running errands, doing chores around the house or to keep child calm in public places. Only 22.2% never leave children unsupervised with screen viewing activity.

Table 2. Frequency of screen viewing when caregiver is out running errands or doing chores

	Frequency (n)	**Percentage (%)**
Sometimes	136	37.7
Often	75	20.8
Hardly ever	21	5.8
Never	80	22.2

As presented in Table 3, the main reason given for children's screen time use was that it is a distraction tool (29.9%) followed closely by using it to calm child or to prevent negative behaviour (26%) and education (22.4%).

Table 3. Reasons for screen viewing by children

Reasons	**Frequency (n)**	**Percentage (%)**
Distraction tool	108	29.9
To calm child/ prevent negative behaviour	94	26.0
Education	81	22.4
For baby/ toddler to rest	19	5.3
Family time	18	5.0
Other	16	4.4
Babysitter	2	0.6
Used as a reward/ punishment	1	0.3

The result of qualitative study also showed that majority of participants use screen time as a reward or punishment for certain behaviours.

"I give the phone if he is good and it stops him from going outside to the neighbour's house to watch TV…..we have no TV so I give him the phone to watch…he watches ABC, songs and kids things and is learning from it…he watches while I prepare dinner….I ask him to not take the phone too close to the eyes…he is smart, learning fast from the phones, he knows how to turn it on now, [giggles] learning to sing and dance, it keeps him happy…but sometimes he runs away to watch TV outside, neighbours house, then he is there and won't want to come back quickly, they have a baby also…I prepare food then go and get him…." (Mum of 2-year-old, FGD participant)

Participants also mentioned that provision of phones or allowing the infant to screen-time is a form of entertainment:

"For me watching cartoons on the phone and TV is a good form of entertainment for my one-year-old as she has

nothing much to do…" (Mum of one year old, FGD participant).

In many cases, caregivers allow screen time as a form of distraction, so it enables them to do other chores or even calms them down.

"My child becomes very frustrated and bangs his feet and hands when I do not give the phone to him so I have no choice but to give it, he watches until the battery goes down (giggles from mum) …in one way it is good as it keeps him inside the house and not running away to the neighbour's house, otherwise he will not be home…" (Mum of 18-month-old, FGD participant).

Another participant stated:

"I give him the phone and TV to watch while I prepare the meals. That way he is kept busy and lets me do all my work" (Mum of 1 year old, FGD participant).

It was alos noticed by another participant that;

"When he cries, I give the phone and he stop crying [giggles], it helps to calm him down…baby watches and watches and then feels sleepy …it helps him to sleep, especially the nursery rhymes on the phone" (Mum of 7-month-old, FGD participant)

Screen-time is also allowed by caregivers for educational purposes, to learn how to read and to expose children to early learning in life:

"We live in this modern world where kids need to know and learn early about how to keep up to the world, but limits are important" (Dad of 4-month-old boy, FGD participant)

Another participant mentioned that:

"For me I don't want my little one to watch TV or phone, but I am working and people at home show her the phone. She watches TV in the daytime together with grandparents and that keeps them occupied, like she does not watch full time but it's in the background, so she watches from time to time…." (Mum of 2-year-old girl, FGD participant)

3.3 Frequency of Applications Used

As Table 4 presents, 30.5% of the participants downloaded apps on their mobile devices for children to use, and of these, almost half (46%) downloaded more than two apps and 43% downloaded one app. 11% downloaded two apps. 69.5% of the participants did not download any apps on the mobile devices. Educational, entertainment and content delivery apps were popular across all age groups. For participants that did not download any apps, children that were engaged in screen viewing (mostly via mobile device), viewed directly from YouTube, a content delivery application. YouTube was popular among children 12 – 24 months of age. Netfix, another content delivery application was also reported by at least three participants.

Table 4. Percentage of applications downloaded on mobile phones (n=361)

Apps downloaded	Number of Apps	Frequency (n)	Percentage (%)
Yes		110	30.5
	> 2 apps	51	46
	only 1 app	47	43
	2 apps	12	11
No		251	69.5

3.4 Child Ability with Screen Device

One quarter (25.5%) of the participants stated that children always needed help in navigating a screen device, 5% needed help sometimes and 5% needed help most of the time. 5.8% of the children did not need any help navigating through the screen device. 59% of the respondents did not provide an answer mainly because their child was not engaged in screen viewing.

3.5 Consequences of screen time

Majority (60%) of the participants thought that there is some negative consequence of screen viewing, while 24% thought that there is no negative consequence of screen viewing. 16% did not provide an answer mainly because they were unsure (could not say either yes or no). The main negative consequence stated was effects to children's

vision. When asked about whether there was any positive consequence of screen viewing on children, the vast majority 56% said yes while 25% said no. 19% did not provide an answer and this was mainly because they were unsure. The main positive consequence stated was that it helps in children's learning and education.

3.5.1 Negative Consequences

As Table 5 reveals, 211 participants stated that there are negative consequences of screen viewing on children. The vast majority (66.4%) noted the negative consequence as bad effect to the eye including watery eyes, swollen eyes, and painful eyes. 5.2% of participants identified addiction as the negative effect. A few of the participants (less than 2% each) stated that screen viewing affects children's sleep, has bad influence on them, had bad impact on education, distracts them from being active, makes them idle, exposes children to violent content, and makes them aggressive.

Table 5. Negative Consequences of screen viewing as perceived by parents/ caregiver (n=211)

Negative Consequence	Frequency (n)	Percentage (%)
Affects eyes (including watery eyes, swollen eyes, painful eyes, more blinking)	140	66.4
Addiction	11	5.2
Child does not want to socialise	2	0.9
Bad influence	1	0.5
Negative impact on education	1	0.5
Less communication with parents, cuts bonding time	2	0.9
Child not interacting with sibling	1	0.5
Sleep affected	4	1.9
Distracts children from being active, sedentary behaviour	2	0.9
Exposure to violent content	2	0.9
Kids do not want to do anything else, makes kids idle	3	1.4
Radiation can cause brain cancer	1	0.5
Aggressive behaviour	3	1.4
Affects brain cells	2	0.9
Cause headache	1	0.5

Qualitative study showed that some of parents/ caregivers stated that exposure to screen devices has physical consequences including effects to eyes.

"It's not good, affects eyes. Sometimes they need food but they still watching, they don't care about food" (Mother of 2-year-old boy)

Another participant mentioned:

"Radiation is not good, harms eyes…can get addicted and they become inactive watching TV for long time…." (Mother of 7-month-old, FGD participant)

Some of participants mentioned that screen time can expose children to violent content and at the same time make them aggressive.

"Can get furious when you take the tablet away from her, like if she is eating, she will throw away everything…" (Mother of 2 children, the older one 2 years watches phone and has a tablet of her own, watches every day for about an hour at a time, the younger boy 6 months does not watch but tries to snatch the phone from elder sister. Parents watch with the 2-year-old sometimes. Note they brought tablet to the MCH clinic and the 2-year-old watched full time while they were waiting).

"My little one is addicted. If you do not give the phone, she gets angry and jumps to the floor…." (Mother of 2 year old, FGD participant)

It was also stated that

"If they have too much screens, they don't want to do anything else. That's not good for them…. makes them idle –

they just sit and watch either the phone or the TV and don't want to play with the other kids outside…. he does not want to play outside with other children but with me full time…so I give him the phone while I do my other job…" (Mother of 1 year old)

3.5.2 Positive Consequences

As Table 6 shows, majority of participants (76.7%) stated that they feel screen viewing helps in their children's education, or learning process for example learning English, alphabets, colors and numbers. 4.8% stated that it helped to keep their children calm or to stop them from crying. 3.8% stated that screen viewing helped in putting children to sleep and 2.4 % stated that it helped their children to talk and develop speech. The remaining less than 2% each stated that screen viewing made learning fun for children, helped in brain development of children, is a form of entertainment for children, or helps in preventing negative behaviour.

Table 6. Positive consequences of screen viewing as perceived by parents/ caregiver (n=210)

Positive Consequence	Frequency (n)	Percentage (%)
Helps in education, children learn from it, become smarter, learn English, alphabets, colours and numbers. Makes learning fun	161	76.7
Helps in brain development of child, makes them smarter	7	3.3
Calms baby, stop crying	10	4.8
Religious songs, prayer	2	1
Form of entertainment for baby	2	1
Helps children to talk, speech	5	2.4
Good for distracting child while doing housework	4	1.9
Helps in putting them to sleep	8	3.8
Helps in preventing negative behaviour	1	0.5
Family time	1	0.5
Helps in moving	1	0.5

Analysis of qualitative data shows that participants think screen time has educational benefits for their children.

"I let my son view screen so that he is smart from a very young age…." (Mother of 12 months old boy)

 Another participant stated:

"I have two children, this one is new born, very small so we do not give any phone to watch ..she cannot even hold the phone but gets attracted to the advertisements on television so when we watching television in the sitting room and advertisements come up, the baby tries to turn her head to watch…she takes a glimpse but does not keep watching until another loud sound of advertisement comes up…I think it is helping her to more and recognise sounds but loud sound may be not so good for her….with the older son, we let him watch cartoons and learn ABC, he is nearing 2 years but can already start talking some words in English…" (Mother of 2 children)

Screen time identified as a firm of entertainment for children.

"I put TV on and its entertainment for all of us…it makes us happy and busy at home…We watch the serial 'Pavitra Rishta' and some others and very little film…my daughter in law and son goes to work and me and my husband look after my son's baby, he is getting naughty, before it was good when he was small it was easy yeah, just change the diaper and give milk but now he is pulling everything on the floor…crawling very fast and may be walking soon….it's good the phone calms him, we give it sometimes when he doesn't want to eat, we give the food and he start eating [giggle]… its good and bad, we should not give too much and just little…" (Grandparents of 9 month old baby)

4. Discussion

This study filled a gap in literature at the local level by determining the reasons and the perceptions of parents/ caregivers in affecting screen viewing behaviour among children under 2 years in Fiji. Discussion on the results of this study in relation to the existing research literature is presented below. Possible explanations for high screen time are discussed in the subsequent sections.

4.1 Reasons for Screen Viewing

This study found that most parents/ caregivers use screens as a means of distraction for children so they could do their housework, prevent negative behaviour (such as screaming, running around or becoming fussy), feed their child etc. The study by Hanrahan et al (2018) and Greco (2013) found that distraction techniques such as screen devices can be successful in reducing discomfort and anxiety children sometimes feel when experiencing medical procedures. Compared to other studies, this study did not find many parents using screen device as a reward and punishment. The study by Hawi & Rupert (2015) however found that a significant number of parents use screen devices as a discipline tool to reward their children's good behaviour and/or prohibit the use of screen devices to punish children's bad behaviour. For instance, children whose parents allowed the use of screen devices to reward their good behaviour were more likely to exceed the recommended screen time compared to children who were not rewarded with screen devices.

To parents/ caregivers that participated in this study, negative behaviour included any behaviour they perceived as wrong and disturbing including children being fussy, not wanting to eat, screaming, running around making noise, throwing things etc. These however are mere things when compared with the other behavioural problems children can sometimes have including lying, defiance, impulsive behaviour and aggression. Guiding children's behaviour is an important aspect of educating and caring for children. There are various healthy and child friendly treats that parents or caregivers can offer children to keep them engaged while doing their housework or while feeding children, instead of offering the screen device. These can include, coloring, playing with a balloon, healthy snack or beverage etc. Since young children's attention spans are so short, distraction is often effective (The Washington Post, 2011). There are various forms of distraction available to handle children however the fact that more and more parents are using screens to distract children is quite concerning.

This study also found that most parents/ caregivers watched screens mainly when children were sleeping, this is in contrast with existing literature (Jago et al., 2012; Kildare & Middlemiss, 2017). The study by Jago et al. (2012) noted that parental TV viewing was strongly associated with children's TV viewing time across all sex and age subgroups. Kildare & Middlemiss (2017) also demonstrated that children's non–mobile media use reflects their parents' non–mobile media use, and emerging evidence draws the same conclusion for mobile media device use (Barber et al., 2017). Parents' mobile media device use during parent-child interactions makes them both verbally and nonverbally less responsive to their children. The study by Barber et al. (2017) showed that Mothers' TV-time, the time the TV was on in the home, and mothers' attitude towards child TV-time, all significantly predicted child's TV-time.

Furthermore, this study found that majority of parents had downloaded more than two software applications (apps) for their children to use. According to the respondents, the most popular were the educational and entertainment apps including *Netfix*, *Biblical and religious apps*, *Nursery Rhymes, Cartoons, Colours, ABC and Quick Maths.*

The swift adoption of tablets and smartphones has sparked an unprecedented explosion of software games, videos and educational programs aimed at the very youngest minds, dramatically increasing the amount of time these children are spending in front of electronic media (Council on Communications and Media, 2011). Experts estimate that tens of thousands of kid apps are offered on Apple and Google Android devices, with titles such as '*BabyPlayFace'* and '*Elmo's Birthday'*. This is quite worrying for some educators and child-development experts who view the flood of baby and toddler apps with trepidation (Sigman, 2017). According to a statement by the American Academy of Pediatrics (2011), for children 2 or younger, all those screens can have a negative effect on development.

For parents that did not download any apps, children viewed videos directly from YouTube. YouTube is a popular video repository offering family entertainment channels (Buzzi, 2011). However, pornography is flooding the Internet and children can accidently access unsafe videos. Specifically, porno audio content inserted into popular cartoons is present in YouTube, with the risk of exposing children to disturbing experiences (Buzzi, 2011; Quadara, 2017).

Parents stated that children watched from YouTube not from YouTube Kids. YouTube was very popular with kids hence in 2015 the website decided to create a channel specifically geared towards younger children called YouTube Kids. YouTube Kids was developed for 7-year-olds and older to have a safer space (Buzzi, 2011). While YouTube Kids has some restrictions on emotionally upsetting and violent stunts and pranks, inappropriate materials may still be accessible. For children above 2 years, downloading apps instead of allowing children to watch from YouTube is safer in this regard.

4.2 Parents/ Caregivers Perception on Children Screen Viewing Behaviour

The study found that while most of the parents know that there are negative consequences of screen time on their children, they however do not know all the detrimental health effects of screen viewing by children as young as 2 years. Most parents/ caregivers think the only effect is that related to children's eye health (66%) and are unaware of all the other health consequences. This finding denotes the Iceberg Principle or Iceberg Theory. The Iceberg Principle (Iceberg Theory) is a theory that suggests that aggregated data can hide information that is important for the proper evaluation of a situation (Iceberg of Disease Concept, 2011). This study revealed that only a few of the negative consequences of screen viewing is apparent to most parents/ caregivers such as effect to eyes including eye strain and blurred vision; while the bulk of the consequences is not known by parents/ caregivers) including poor metabolic profile, higher risk of obesity, neck, back and shoulder pain, poor social life, psychological stress, brain damage, emotional problems, attention deficit, speech and language development delays and so on.

It is quite concerning that a substantial percentage of parents (24%) also think that there is no negative effect at all on children engaged in screen viewing. This clearly shows the lack of knowledge of parents.

Researchers suggest that children's screen time is linked to norms in the household which are determined in part by individual level variables, including parental beliefs and attitudes about how often and in what ways media devices are used in the home (Bochner & Eisenberg, 1987; Coyne et al., 2014; Calvert et al., 2002). The study by Minges et al. (2015) and He et al. (2010) showed that although parents are generally well informed about the negative impacts of high screen use and the need to restrict screen time in children, many are high screen users themselves.

In this study, a large number of parents/ caregivers felt that children did not need restrictions on screen viewing in order to prevent extended periods of viewing. For instance, some parents explained that their child did not have the attention span for extended periods of television viewing and could only view 15 – 30 minutes of television before moving onto something else. This was common among children who were just few months old. As the study reveals, parents may be unaware of all the detrimental effects of screen time for children hence it makes sense that they do not see the importance of restricting screen time. The study by Schoeppe et al. (2016) however revealed that most adults think it is appropriate to restrict children's screen time to ≤ 2 h/day but few adults themselves adhered to ≤ 2 h/day of leisure-related screen time. Several studies have shown that adult rules on screen use can effectively deter children from participating in excessive TV viewing and computer use (Barradas et al., 2007; Jago et al., 2011; Carlson et al., 2010). However, it is not just the presence of screen time rules and restrictions that is important but also the support through adult modelling of low screen use (Wartella et al., 2013; Chiu et al., 2017). The study by Hawi & Rupert (2015) found that children who tend to continue to use screen devices in the presence of their parents have significantly higher odds of averaging screen time in excess of the 2-hour cutoff.

This study found that more than half (56%) of the parents (or caregiver guardians) think that screen viewing below the age of 2 years has positive consequences on their children. Of these the vast majority (76.7%) think that screen viewing actually makes their children smart/ helps them to learn from a very young age. Consistent with the findings of this study, Ortiz et al. (2011) found that parents view current technology as important to their child's academic performance and future job success. In this study many parents confessed that screen time has made their children smart, helps them learn. Quote from a mum, 'This child is actually learning English from such a young age…' As the study found, parents use screen time for all sorts of reasons including to calm down their children, stop them from crying, distraction tool while they tidy their housework, to help them to sleep and to help develop their speech. This suggests that digital devices are used as 'digital pacifiers' to placate or distract children or as a means to manage children's behaviour. Alternative explanations include parent's desire to educate their child or have their child develop good communication skills. The study by Barber et al. (2017) also notes that mother's attitudes towards child's TV time significantly affected TV viewing behaviour. Further, the study found that the strength of this association increased as the children aged; by the age of 36 months every hour of mother's TV viewing was associated with an increase of around 25 min in child TV viewing. This suggests that mothers' TV-time may be a key target for intervention. Furthermore, the strength of the association between mother and child TV-time increased as the children aged, thus supporting the idea that early intervention would reap greater effectiveness. In the Northwestern study, although parents used media as a tool for managing daily life, most parents (70%) did not think the devices made parenting easier (Bochner & Eisenberg, 1987). The study by Hawi & Rupert (2015) found that children whose parents did not establish home policies for screen time were more likely to exceed the recommended screen time compared to those whose parents did have policies for screen time.

The study by Radesky et al. (2014) also notes that parental motivations to provide screen time before 2 years of age may stem from household or family characteristics (example single parent household or maternal depression), beliefs in educational value of media, and TV's ability to keep children occupied while parents get things done

around the house. On a behavioural level, screen addicts appeared to be constricted with regards to their impulse control and behavioural inhibition.

Some parents in this study mentioned that children showed aggressive and violent behaviours when screens were not given. This was consistent to findings from Radeskey et al. (2014) that showed that that infants rated by their mothers as fussy were exposed to more TV. In that study, infant behaviours and media use were measured at the same time, so it is unknown whether media exposure is dysregulating to infants or whether parents are using TV to try to calm their fussy infants.

This study clearly demonstrates that many parents/ caregivers feel the pressure of decisions over screen viewing worrying, as they describe, not only that their children may become 'addicted' to screens or have other negative effects but also that if they fail to provide digital opportunities, their children will be 'left behind'.

4.3 Limitations

Results of this study cannot be generalised to all children in Fiji as it was conducted specifically in the Suva sub-division. Although the sample size of this study was adequate, the diversity of the study in terms of ethnicity was not fully proportional and representative so *iTaukei* were overrepresented. The baseline demographical information did not show equal representation of sample in terms of age and ethnicity.

5. Conclusion

Majority of parents/ caregivers (60%) in Fiji know that there are negative consequences of exposure to screens on children below 2 years, yet they engage children to screen activity. Parents/ caregivers in Fiji also trust in screen viewing's positive impact on their children. Early childhood is an important time of development and is a crucial window for intervention, hence parental engagement and role modelling are critical for the development of healthy habits of children. More research is necessary on the mechanisms by which screen viewing interacts with child outcomes in Fiji and the types of interventions that can mitigate the effects of screen exposure in children's development.

Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

References

Australian Government Department of Health. Physical activity and exercise guidelines for all Australians. Retrieved from https://www.health.gov.au/health-topics/physical-activity-and-exercise/physical-activity-and-exercise-guidelines-for-all-australians?utm_source=health.gov.au&utm_medium=callout-autocustom&utm_campaign=digital_transformation

Barber, S. E., Kelly, B., Collings, P. J., Nagy, L., Bywater T., & Wright, J. (2017). Prevalence, trajectories, and determinants of television viewing time in an ethnically diverse sample of young children from the UK, *International Journal of Behavioral Nutrition and Physical Activity, 14*, 88. https://doi.org/10.1186/s12966-017-0541-8

Barradas, D. T., Fulton, J. E., Blanck, H. M., & Huhman, M. (2007). Parental influences on youth television viewing. *J Pediatr, 15*(4), 369-73. https://doi.org/10.1016/j.jpeds.2007.04.069

Bentley, G. F., Turner, K. M., & Jago, R. (2016). Mothers' views of their preschool child's screen-viewing behaviour: a qualitative study. *BMC Public Health, 16*. https://doi.org/10.1186/s12889-016-3440-z

Bochner, A., & Eisenberg, E. (1987). Family process: System perspectives on family communication, *Handbook of communication science*. Sage: Beverly Hills.

Buzzi, M. (2011). What Are Your Children Watching on YouTube? *Advances in New Technologies, Interactive Interfaces and Communicability*. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-34010-9_23

Kang, C. (2011). Kid Apps Explode on Smartphones and Tablets. But Are They Good for Your Children?. *The Washington Post*, *17*.

Calvert, S. L., Jordan, A. B., & Cocking, R. R. (2002). *Children in the digital age: Influences of electronic media on development*. Praeger Publishers/Greenwood Publishing Group.

Canadian Paediatric Society. *Caring for Kids*. Retrieved from https://caringforkids.cps.ca/

Carlson, S. A., Fulton, J. E., Lee, S. M., Foley, J. T., Heitzler, C., & Huhman, M. (2010). Influence of limit-setting and participation in physical activity on youth screen time. *Pediatrics, 126*, 89-96.

https://doi.org/10.1542/peds.2009-3374

Chiu, Y. C., Li, Y., Wu, W., & Chiang, T. (2017). The amount of television that infants and their parents watched influenced children's viewing habits when they got older. *Acta Pædiatrica, 106*, 984-90. https://doi.org/10.1111/apa.13771

Council on Communications and Media, & Brown, A. (2011). Media use by children younger than 2 years. *Pediatrics, 128*(5), 1-6. https://doi.org/10.1542/peds.2011-1753

Cox, R., Skouteris, H., Rutherford, L., Fuller-Tyszkiewicz, M., Dell' Auila, D., & Hardy, L. (2012). Television viewing, television content, food intake, physical activity and body mass index: A cross-sectional study of preschool children aged 2-6 years. *Health Promotion Journal of Australia, 23*, 58-62. https://doi.org/10.1071/HE12058

Coyne, S. M., Padilla-Walker, L. M., Fraser, M., Fellows, K., & Day, R. D. (2014). Media time = family time": Positive media use in families with adolescents. *Journal of Adolescent Research, 29*(5), 663-88. https://doi.org/10.1177/0743558414538316

Domingues-Montanari, S. (2017). Clinical and psychological effects of excessive screen time on children. *Journal of Paediatric and Child Health, 53*, 333-38. https://doi.org/10.1111/jpc.13462

Duch, H., Fisher, E. M., Ensari, I., Font, M., Harrington, A., Taromino, C., … & Rodriguez, C. (2013). Association of Screen Time Use and Language Development in Hispanic Toddlers: A Cross-Sectional and Longitudinal Study. *Clinical Pediatrics, 52*, 857-65. https://doi.org/10.1177/0009922813492881

Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing. 62*(1), 107-15. https://doi.org/10.1111/j.1365-2648.2007.04569.x

Fiji Ministry of Health and Medical Services. (2021). *Expanded Program on Immunisation Data, Data Analysis Management Unit. Fiji*. 2021

Greco, M. (2013). *Effectiveness of an iPad as a Distraction Tool for Children during a Medical Procedure*. Munchie, Indiana: Ball State University.

Hanrahan, K., Kleiber, C., & McCarthy, A. M. (2018). Distraction in Action: Helping Children during Medical Procedure in Community and Public Health Settings. *Journal of Community & Public Health Nursing, 4*(2), 217. https://doi.org/10.4172/2471-9846.1000217

Hawi, N. S., & Rupert, M. S. (2015). Impact of e-Discipline on Children's Screen Time. *Cyberpsychology, behavior and social networking, 18*(6), 337-42. https://doi.org/10.1089/cyber.2014.0608

He, M., Piché, L., Beynon, C., & Harris, S. (2010). Screen-related Sedentary Behaviors: Children's and Parents' Attitudes, Motivations, and Practices. *Journal of Nutrition Education and Behavior, 42*(1), 17-25. https://doi.org/10.1016/j.jneb.2008.11.011

Heelan, K. A., & Eisenmann, J. C. (2006). Physical Activity, Media Time, and Body Composition in Young Children. *Journal of Physical Activity and Health, 3*, 200-09. https://doi.org/10.1123/jpah.3.2.200

Hinkley, T., Salmon, J., Okely, A. D., Crawford, D., & Hesketh, K. (2012). Preschoolers' physical activity, screen time, and compliance with recommendations. *Medicine & Science in Sports & Exercise, 44*, 458-65. https://doi.org/10.1249/MSS.0b013e318233763b

Iceberg of Disease Concept - Preventive Medicine. Retrieved from https://www.medicotips.com/2011/12/iceberg-of-disease-preventive-medicine.html

Jago, R., Davison, K. K., Thompson, J. L., Page, A. S., Brockman, R., & Fox, K. R. (2011). Parental sedentary restriction, maternal parenting style, and television viewing among 10-to 11-year-olds. *Pediatrics, 128*(3), 572-8. https://doi.org/10.1542/peds.2010-3664

Jago, R., Stamatakis, E., Gama, A., Carvalhal, I. M., Nogueira, H., Rosado, V., & Padez, C. (2012). Parent and Child Screen-Viewing Time and Home Media Environment. *American Journal of Preventive Medicine, 3*(2), 150 - 8. https://doi.org/10.1016/j.amepre.2012.04.012

Kildare, C. A., & Middlemiss, W. (2017). Impact of parents mobile device use on parent-child interaction: a literature review. *Computers in Human Behavior, 75*, 579-93. https://doi.org/10.1016/j.chb.2017.06.003

Mark AEJ, I. (2008). Relationship between screen time and metabolic syndrome in adolescents. *Journal of Public Health (Oxford, England), 30*(2), 153-60. https://doi.org/10.1093/pubmed/fdn022

Minges, K. E., Owen, N., Salmon, J., Chao, A., Dunstan, D. W., & Whittemore, R. (2015). Reducing youth screen time: Qualitative metasynthesis of findings on barriers and facilitators. *Health Psychology, 34*(4), 381-97. https://doi.org/10.1037/hea0000172

Moon, J. H., Lee, M. Y., & Moon, N. J. (2014). Association between video display terminal use and dry eye disease in school children. *Journal of Pediatric Ophthalmology Strabismus, 51*, 87-92. https://doi.org/10.3928/01913913-20140128-01

Ortiz, W., Green, T., & Lim, H. (2011). Families and home computer use: Exploring parent perceptions of the importance of current technology. *Urban Education, 46*(2), 202-15. https://doi.org/10.1177/0042085910377433

Quadara, A., El-Murr, A., & Latham, J. (2017). *The effects of pornography on children and young people: An evidence scan* (Research Report). Melbourne: Australian Institute of Family Studies.

Radesky, J. S., Silverstein, M., & Zuckerman, B. (2014). Infant Self-Regulation and Early Childhood Media Exposure. *Pediatrics, 133*, 1172-78. https://doi.org/10.1542/peds.2013-2367

Rideout, V. J., Foehr, U. G., & Roberts, D. F. (2010). Generation M2: Media in the Lives of 8-to 18-Year-Olds. Report, Kaiser Family Foundation. 400 Sand Hill Road, Menlo Park, California, USA, January.

Schoeppe, S., Rebar, A. L., Short, C. E., Alley, S., Lippevelde, W. V., & Vandelanotte, C. (2016). How is adults' screen time behaviour influencing their views on screen time restrictions for children? A cross-sectional study. *BMC Public Health. 16*(201). https://doi.org/10.1186/s12889-016-2789-3

Segev, A., Mimouni-Bloch, A., & Ross, S. (2015). Evaluating Computer Screen Time and Its Possible Link to Psychopathology in the Context of Age: A Cross-Sectional Study of Parents and Children. *PLoS ONE, 10*, 11. https://doi.org/10.1371/journal.pone.0140542

Sigman, A. (2017). Screen Dependency Disorders: a new challenge for child neurology. *Journal of the International Child Neurology Association*, 1. https://doi.org/10.17724/jicna.2017.119

Sigman, A. (2014). Why general practice must now confront screen dependency. *British Journal of General Practice, 64*, 610-11. https://doi.org/10.3399/bjgp14X682597

Stiglic, N., & Viner, R. M. (2019). Effects of screentime on the health and well-being of children and adolescents: a systematic review of reviews. *British Medical Journal Open, 9*. https://doi.org/10.1136/bmjopen-2018-023191

van den Heuvel, M., Ma, J., Borkhoff, C. M., Koroshegyi, C., Dai, D. W. H., Parkin, P. C., … & Birken, C. S. (2019). Mobile Media Device Use is Associated with Expressive Language Delay in 18-Month-Old Children. *Journal of developmental and behavioural paediatrics. 40*(2), 99-104. https://doi.org/10.1097/DBP.0000000000000630

Vanderloo, L. M. (2014). Screen-viewing among preschoolers in childcare: a systematic review. *BMC Pediatrics, 14*(205). https://doi.org/10.1186/1471-2431-14-205

Wartella, E., Rideout, V., Lauricella, A. R., & Connell, S. L. (2013). *Parenting in the age of digital technology: a national survey. Center on Media and Human Development: School of Communication*, Northwestern University.

World Health Organization [WHO]. (2019). *Guidelines on physical activity, sedentary behaviour and sleep for children under 5 years of age*. Accessed 15 December, 2019. Retrieved from https://apps.who.int/iris/handle/10665/3116633

Wu, X., Chen, X., Han, J., Meng, H., Luo, J., Nydegger, L., & Wu, H. (2013). Prevalence and factors of addictive Internet use among adolescents in Wuhan, China: interactions of parental relationship with age and hyperactivity-impulsivity. *PloS one, 8*(4), e61782. https://doi.org/10.1371/journal.pone.0061782

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