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Research Article

A Prospective Study on Gadget Usage and its Impact to Children

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Abstract

Objective: To determine the prevalence of electronic gadget usage among children who consulted at the Pediatrics department from August 2019 to July 2020.

Design: Prospective, observational, descriptive study.

Setting: Pediatrics department of an international hospital in Shanghai.

Participants: Patients, 0 - 18 years old, who consulted at the Pediatrics department from August 2019 to July 2020.

Methods: Data were gathered from questions asked during history taking. Questions pertain to the following: 1. What gadget does the child use, 2. When does the child use the gadget, 3. Duration of the use, 4. Reason for giving and using the gadget, 5. Problems encountered when the child started to use the gadget, 6. Physical activity, 7. Sleep duration.

Statistical Analysis: Frequency and percentages were used for analysis of results.

Results: Only 17% of children brought a gadget with them during the consultation but 61% use their parents gadgets at home and 46% have their own gadget. Children use the gadget more than 3 times per week during weekdays and weekend and 32% use it more than 3 times per day. Duration varies from 30 minutes, to 1 hour to more than 2 hours and use their gadget without parents' supervision. Majority used the gadgets for playing games. Parents provide gadgets to their children primarily to keep them engaged. Problems reported were feeding problems, reduced physical activity, decreased sleep, eye strain, watery eyes, tantrums, disobedience, irritability, violence tendency, and not interacting with friends. Children still have physical activity, only 7% didn't have any.

Conclusion: Majority of children either have their own gadget or use their parents' gadgets. Reasons vary from playing to educational purposes bringing its pros and cons to the child. Proper supervision, control and limit to the usage of the gadget is they key to minimizing the negative impact and maximizing the positive effects.

Keywords: *Gadget; Tantrums; Eye Strain; Sedentary; Feeding Problem*

Introduction

Background of the study

Gadgets, a part of technology, are widely used by humans, both young and old. Initially these were mainly for communication, but at present they involve daily activities like shopping, payment and entertainment [9].

Physical inactivity has been identified as a leading risk factor for global mortality and a contributor to the rise in overweight and obesity. In 2010, World Health Organization (WHO) published Global recommendations on physical activity for health which detailed

interventions for the primary prevention of non-communicable diseases (NCDs) through physical activity at population level. Estimates from 2012 indicate that not meeting current physical activity recommendations are responsible for more than 5 million deaths globally each year. [5].

Although we know that over 23% of adults and 80% of adolescents are not sufficiently physical active, there are currently no comparable data for younger children [5].

Statement of the problem

What is the prevalence of electronic gadget usage among the pediatric population and its impact to them?

Objectives of the Study

General objective

To determine the prevalence of electronic gadget usage among children who consulted at the Pediatrics department from August 2019 to July 2020.

Specific objectives

- To determine the pattern for electronic gadget usage among pediatric patients based on frequency and duration.
- To enumerate the reasons behind gadget use among children.
- To describe the various positive and negative effects of mobile use amongst children.

Significance of the Study

Technology is a part of our daily lives and gadgets are a type of technology we humans widely use. Gadgets became a trend in today's culture for life and knowledge - education, entertainment, shopping, payment, etc. This has an impact on growth and development of children.

Hence through this study, we may better understand the different pros and cons of gadget use to children, thus can increase the awareness parents, guardians and schools on how to enhance its advantages and minimize the disadvantages to children.

Scope and Limitation

Participants were pediatric patients, ages 0 - 18 years old who consulted from August 2019 up to July 2020 at the Pediatrics department of an international hospital in Shanghai. These include outpatients and inpatients. Emergency patients were not included.

Review of Literature

Sedentary behavior refers to refers to sitting or lying down (with exception of sleeping) at school, at work or at home, when travelling or during leisure time. These require little energy expenditure. Examples are sitting or lying down while watching television or playing electronic games, sitting while driving a vehicle or while travelling, sitting or lying down to read, write or work at a desk or computer [4].

Any waking behaviour characterized by an energy expenditure ≤ 1.5 metabolic equivalents (METs), while in a sitting, reclining or lying posture.

For children under 5 years of age includes time spent restrained in car seat, high-chair, stroller, pram or in a carrying device or on a caregiver's back. Includes time spent sitting quietly listening to a story [5].

Screen time refers to time spent watching television or movies, playing video games using computers and mobiles [3].

Screen time is a major source of sedentary behavior. Excessive screen time in young children is associated with obesity, aggressive behavior, and may negatively impact attention span, language development, and cognitive development [3].

Sedentary screen time is time spent passively watching screen-based entertainment (TV, computer, mobile devices). Does not include active screen-based games where physical activity or movement is required [5].

Teenagers use gadgets 2.5 hours daily to browse the internet and play online games [8].

Playing video or computer games or using computer 3 or more hours per day (not school work on an average school day) increased in 2017 from 2003. It was reported that there is a gradual increase every 2 years. While watching television 3 or more hours per day (on an average school day) decreased from 1998 to 2017 [13].

Methodology

The prospective, observational, descriptive study was conducted from August 2019 to July 2020 (12 months) at an international hospital in Shanghai among patients ages 0 to 18 years old who consulted at the Pediatrics department.

The following data were gathered from the parents/guardians during history taking:

- Age
- Gender
- Does the patient goes to school?
- Did the patient bring a gadget during consultation?
- Did the parents give a gadget during consultation?
    - What gadget was given?
- Do parents have gadgets at home?
    - What gadget do they own?
    - Does the patient use their parent's gadget at home?
- Does the patient has his/her own gadget?
    - What gadget does the patient have?
    - How often does the patient use the gadget within a week?
    - When does the patient use the gadget - weekend or weekdays?

    - How often does the patient use the gadget in a day?
    - How long does the patient use the gadget in a day?
    - What time of the day does the patient use the gadget?
    - Does the patient use it alone or with parent's supervision?
    - What is the reason for using the gadget?
    - Why did the parents give the patient a gadget?
- What physical activities does the patient engage to?
    - How often does the patient engage to physical activity?
- How long is the duration of sleep of the patient?
- What are the problems observed with the patient when child started to use gadgets?

Frequency and percentages were used for analysis of results.

Results and Discussion

Among the respondents, 46% percent were male and 54% were female. Majority of patients were ages 1 year old to 8 years old. Seventy six percent goes to school while 24% do not.

Eighty three percent of patients didn't bring a gadget with them. Only 17% brought a gadget with them during the consultation.

Thirty two percent of parents gave a gadget, the remaining 68% didn't offer any gadget to the child during consultation. Gadget given were mobile phone (69%) and tablet/Ipad (31%).

All parents owned a gadget - mobile phone (100%), laptop (90%), tablet/Ipad (19%) and desk top computer (7%). Sixty one percent of children use their parents gadgets at home while 40% do not allow their children to use their gadgets.

Forty six percent of patients have their own gadget - laptop (2%), mobile phone (27%), tablet/Ipad (22%) and nobody (0%) has a game console.

Pattern of usage of gadgets among children show that majority, 58%, use their gadget more than 3 times per week. Fourteen percent use it 3 times per week, 7% twice a week and 5% once a week.

Sixty six percent use them both during weekdays and weekends, 17% only during weekends and 2% during weekdays.

In a study by Al-Ayouby, he categorized the duration and intensity of using of gadgets in young children as low, medium and high. Duration is low when usage is 5 - 30 minutes, medium if 40 - 60 minutes and high if 75 - 120 minutes. Intensity is said to be low if the children use it maximum 1 - 2 times a day, medium if 2 - 3 times per day and high if more than 3 times a day [1].

Thirty two percent of children use their gadgets more than 3 times per day, 15% 3 times per day, 15% 2 times per day and 24% using them only once per day. Number of hours spent by children per day using electronic gadget varies from 30 minutes (17%), 1 hour (29%).

2 hours (20%) and more than 2 hours (20%). Basing it from Al-Ayouby, 54% of children in this study were medium and high in intensity and 68% had low duration. [1].

Majority of the children (73%) use their gadget alone without parent's supervision and only 12% use them with adult guidance.

There are numerous reasons why children use their gadgets. These are playing games (61%), watching videos (44%), communication (17%), digital payments (17%), learning using education applications (5%), doing school work (7%) and participating in social media (10%).

Parents provide gadgets to their children primarily to keep them engaged (46%). Thirty percent claim that gadgets are part of technology (30%). Some parents give it to prevent tantrums (24%). Fifteen percent were give to utilize the gadget for learning. Other reasons are because children won't listen (10%), to behave during the check-up (5%), to show-off (2%) and to give a break from school (2%).

The health problems related to electronic gadget usage reported in this study are as follows. These are feeding problems (34%), reduced physical activity (27%) and reduced sleep (24%). Problems concerning the eyes were eye strain (12%) and watery eyes (12%). Parents also mentioned occurrence tantrums (30%), disobedience (22%), irritability (10%) tendency to fight (7%), anxiety (5%) and not interacting with friends (5%). Seven percent didn't observe any problems with their child.

Various researches have reported both the positive and the negative influences of gadget use of children. Positive effects reported in previous research were better cognitive skills and increase in knowledge and fine motor skills of the fingers and hands. They believe children where also at less risk for injury compared to playing outside [1]. Children are also introduced to the concept of struggle and effort (winning and losing) when they play games. The good effects were also observed when children used the gadgets in a constructive way (for education purposes) and under their parent's supervision [9].

Speech delay was one negative effect reported because children had less interaction with other people. Attention-deficit disorder-like symptoms like trouble playing attention and overly active were also observed. Child may not communicate, do not care and respond less when they are by parents or other people to talk [4]. Children also becomes addicted to the gadget - easily get angry when not allowed to use the gadget and doesn't care about their environment while using it hence making them introverts and impatient [9]. Increase time spent on gadget usage may cause addiction which could bring negative impacts on social and emotional development in children. Examples are child being a closed, private person, likes to be alone or violent behavior and a threat of cyberbullying [4]. Some develop tendency for violence from exposure to violent contents of games [10]. Examples are child being a closed, private person, likes to be alone or violent behavior and a threat of cyberbullying [4].

Other researches reported the risk of becoming obese due to lack of physical activity or increased sedentary behavior and improper way of eating (too fast or quickly) or some skip meals because attention is on the screen and not on the meal [11]. Binge eating while using the gadget (10.8%) were minimal [2]. Although fine motor skill development were observed, pain in fingers and wrist were reported as well [3]. Eye problems are also common because the eyes become tired and uncomfortable with radiation exposure contributory [1]. Some children wear spectacles at an early ag [2]. Others because of being exposed to blue light results to eye damage such as macular degeneration wherein they may not see real colors properly [3].

We also asked about the pattern of physical activities of the patients. Walking (46%), riding the bicycle (34), playing outdoors (32%), going to the mall (10%), going to church (7%) and playing sports like soccer (2%). Majority (17%) have physical activity more than 3 times per week, 24% only 2 times per week and 14 percent only once a week. Seventeen percent claims to have no physical activity.

Fifty six percent has usually 8 hours sleep, 22% has more than 8 hours of sleep, 20% more than 6 hours of sleep. No patient had less than 6 hours of sleep. This data supports other studies which reveal good overall sleep of children with electronic gadgets by Roopadevi

[2]. Theodorus., *et al.* reported 47.8% occurrence of sleep disorder among adolescents watching television, using computers and playing gadgets [9]. In contradiction to Aparna's report wherein gadget users had good overall sleep (97.9%) [2].

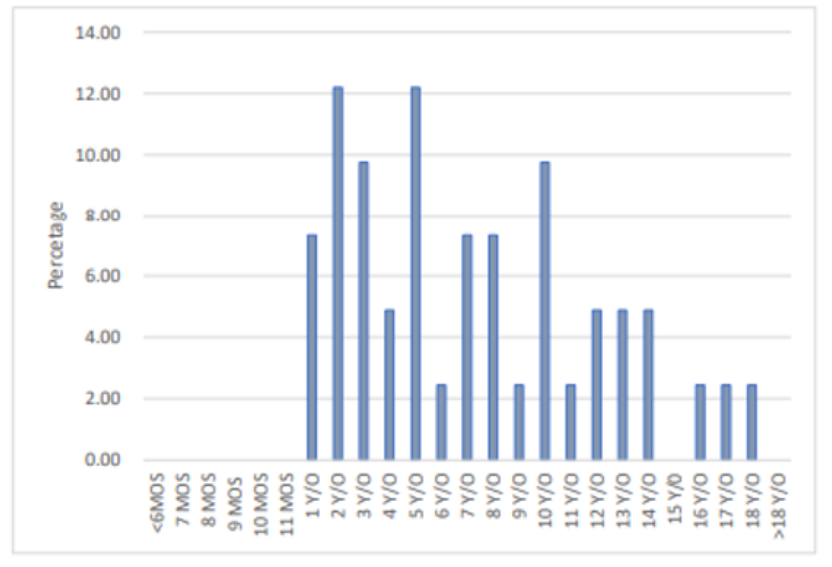

Figure 1: *Distribution of patients based on age.*

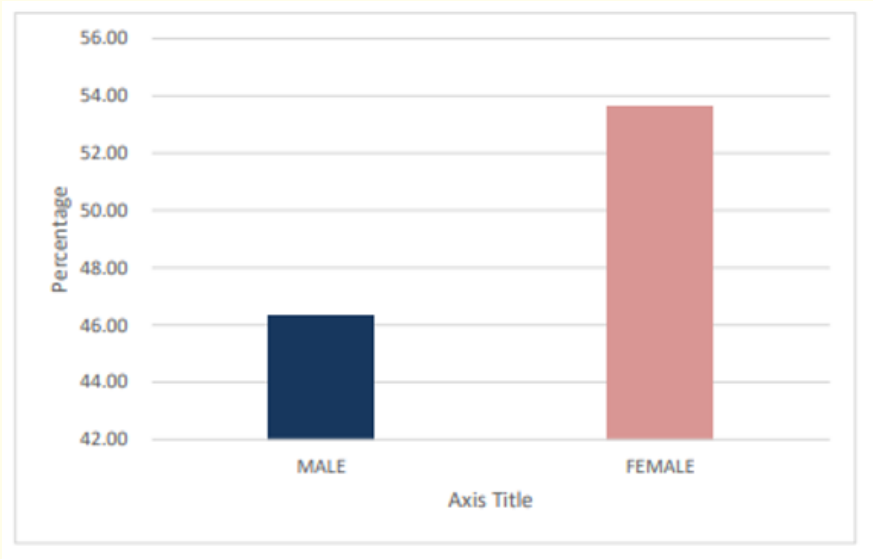

Figure 2: *Distribution of patients based on gender.*

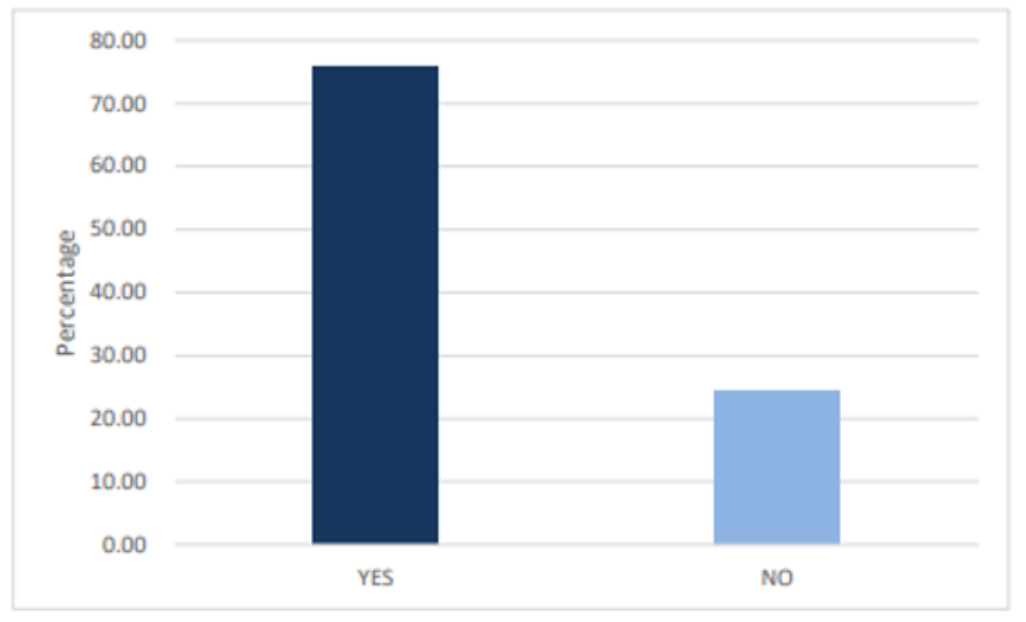

Figure 3: *Child attends school.*

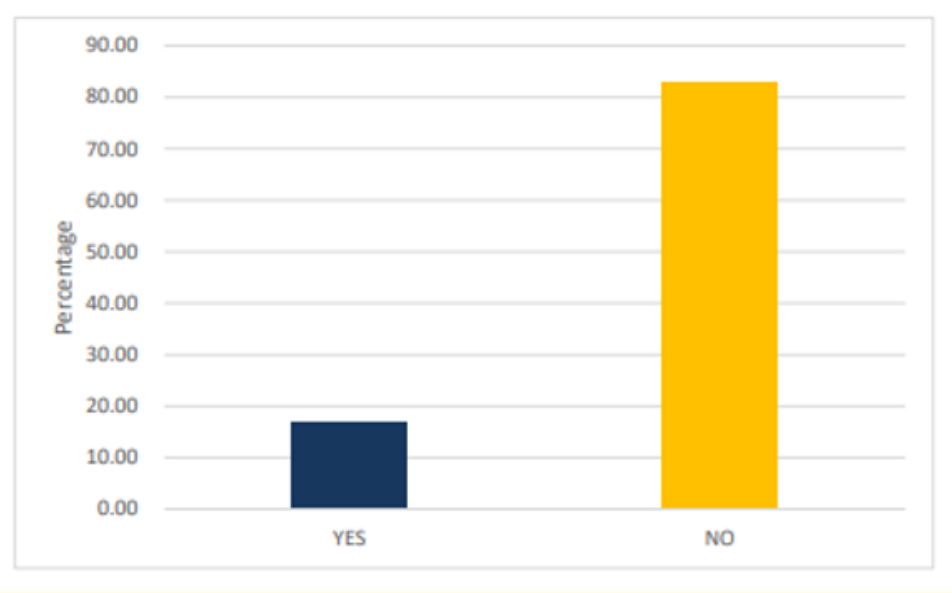

Figure 4: *Child brought gadget during consultation.*

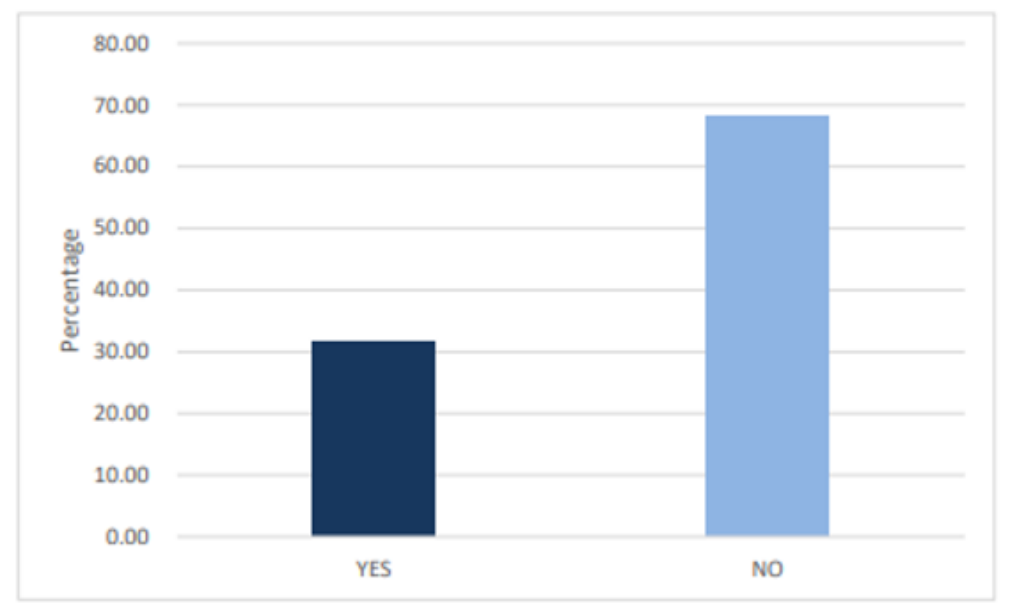

Figure 5: *Parents gave a gadget during consult.*

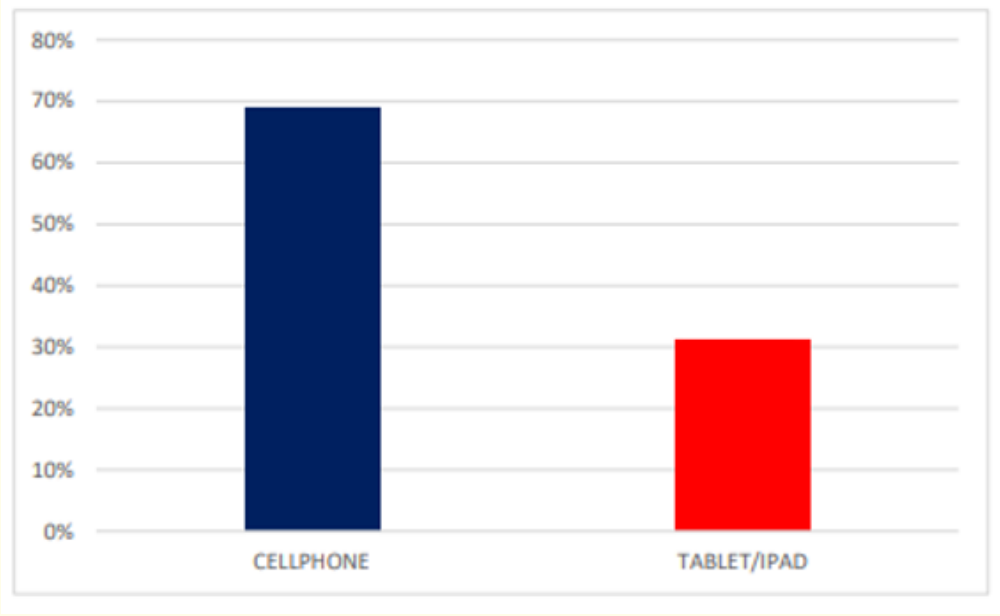

Figure 6: *Gadget given by parents.*

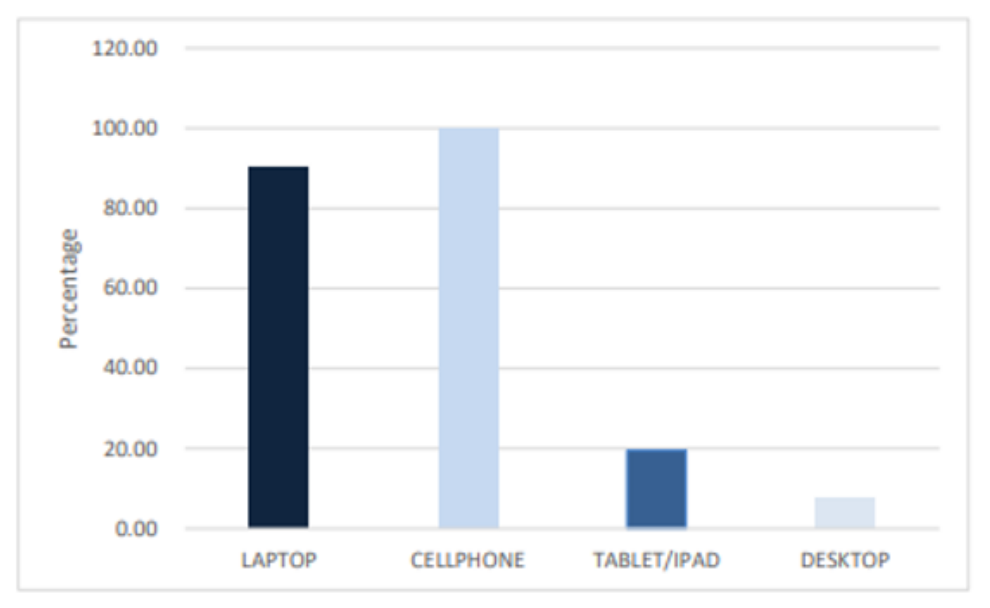

Figure 7: *Gadget owned by parents.*

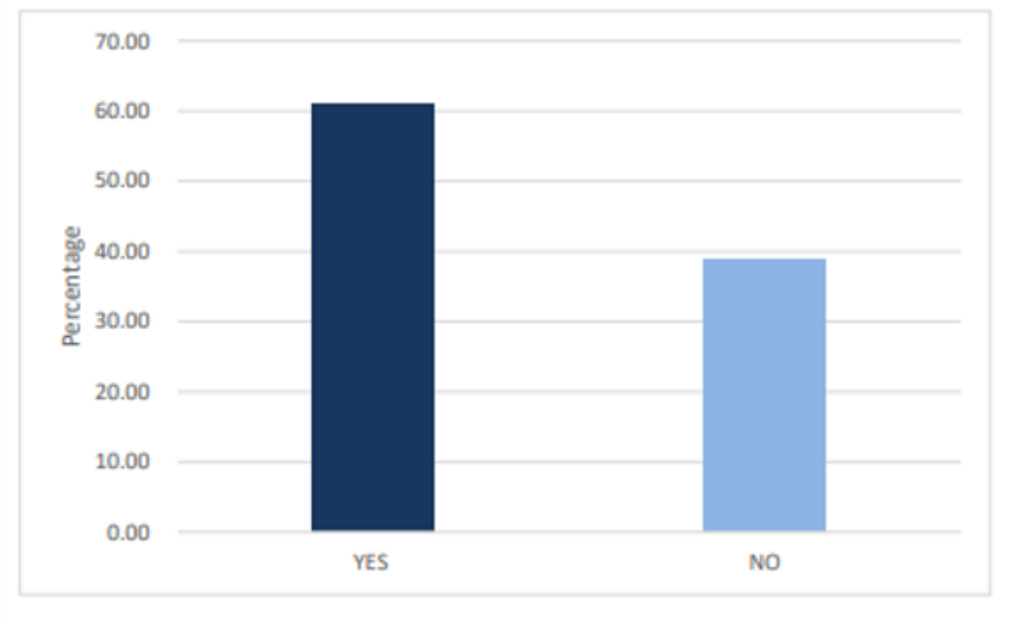

Figure 8: *Child uses parent's gadget.*

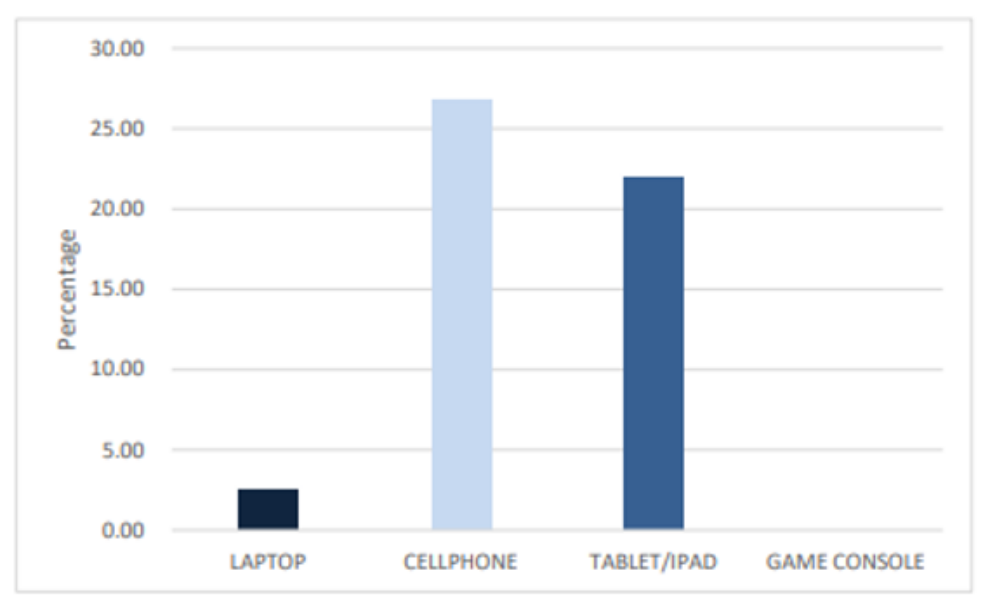

Figure 9: *Gadget owned by child.*

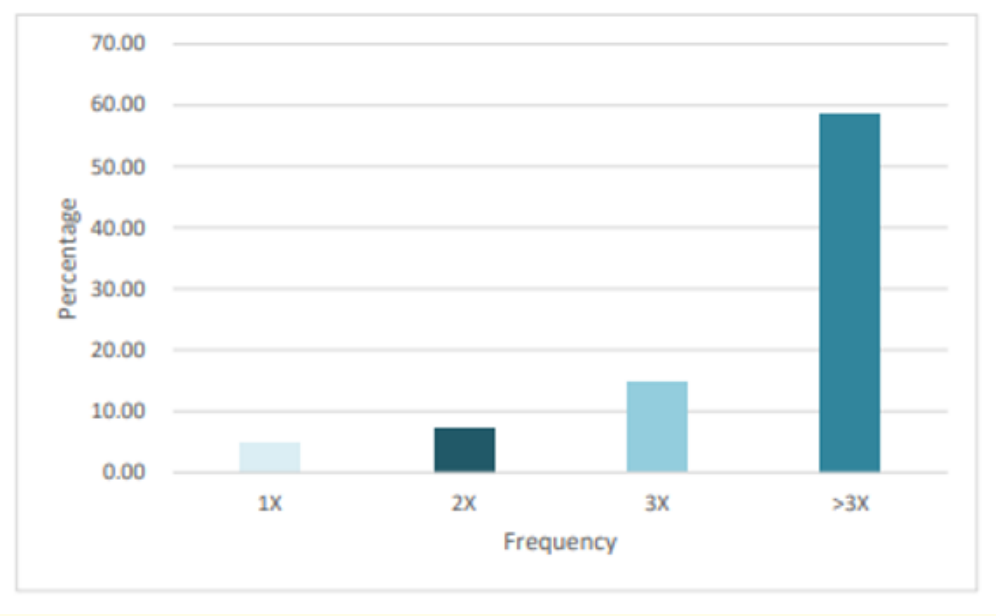

Figure 10: *How often the child uses gadget per week.*

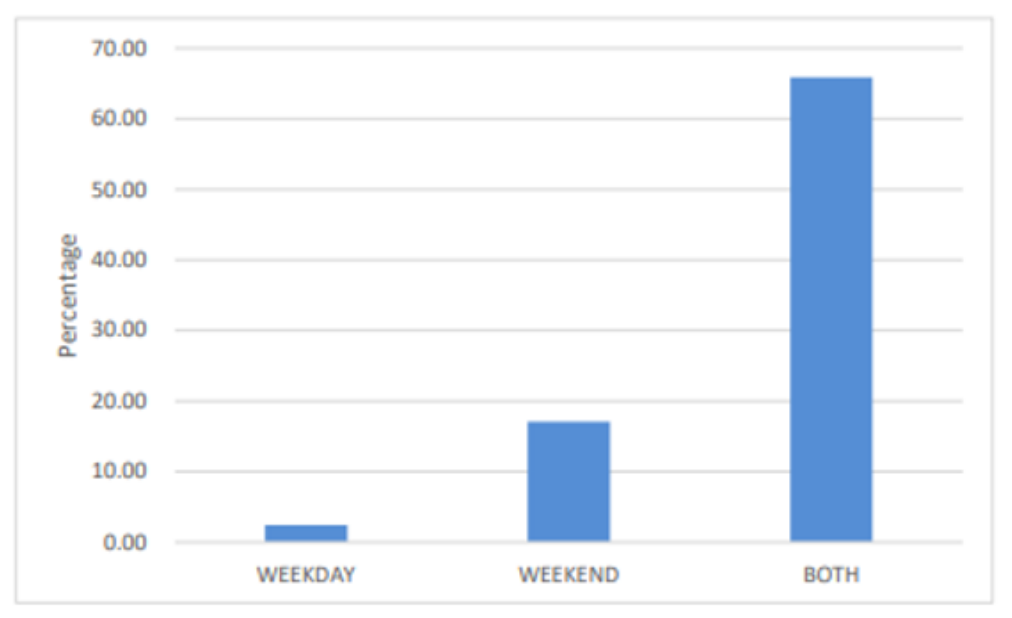

Figure 11: *When does a child use the gadget.*

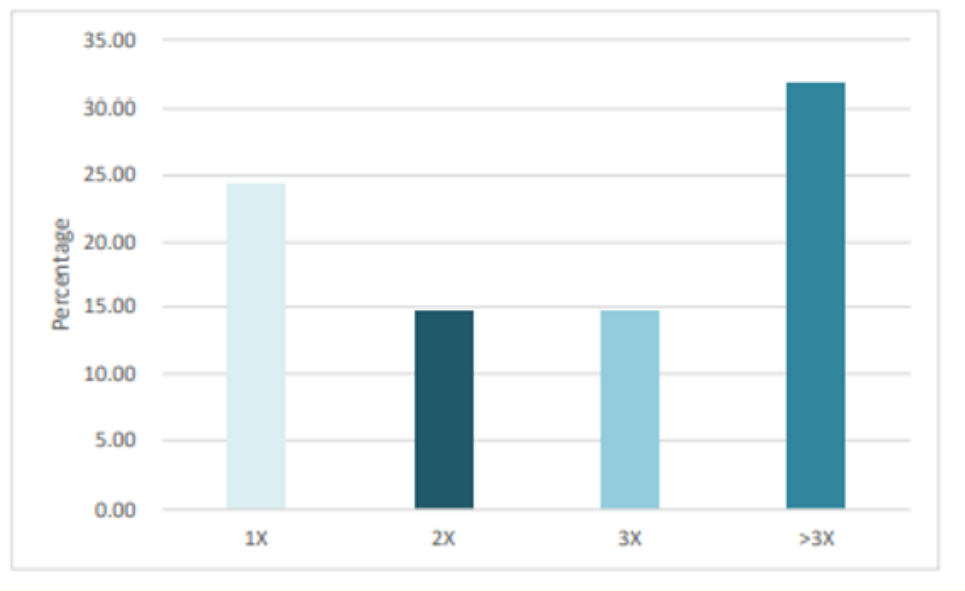

Figure 12: *How often child uses gadget per day.*

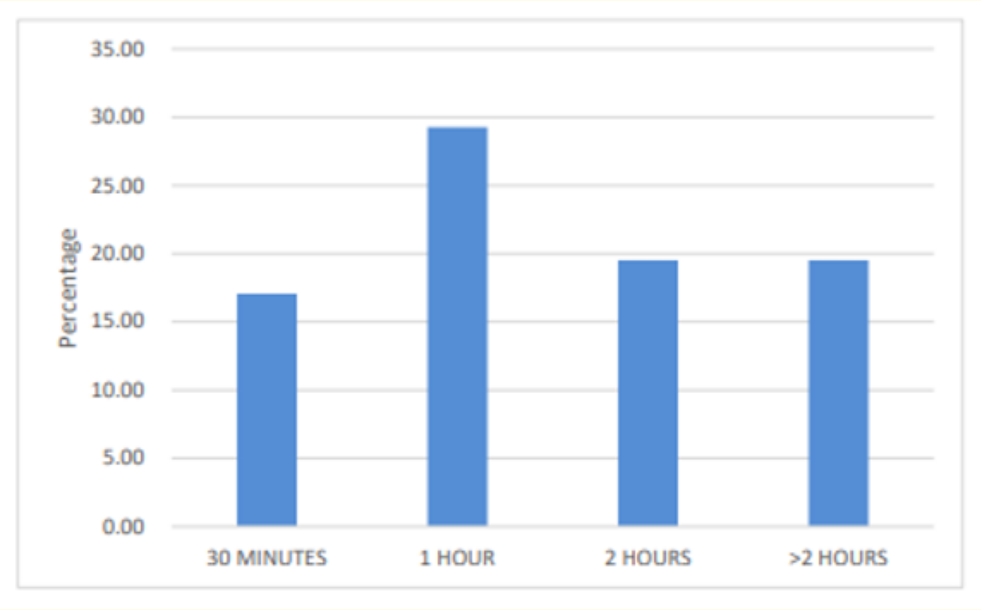

Figure 13: *How long do they use gadget per day.*

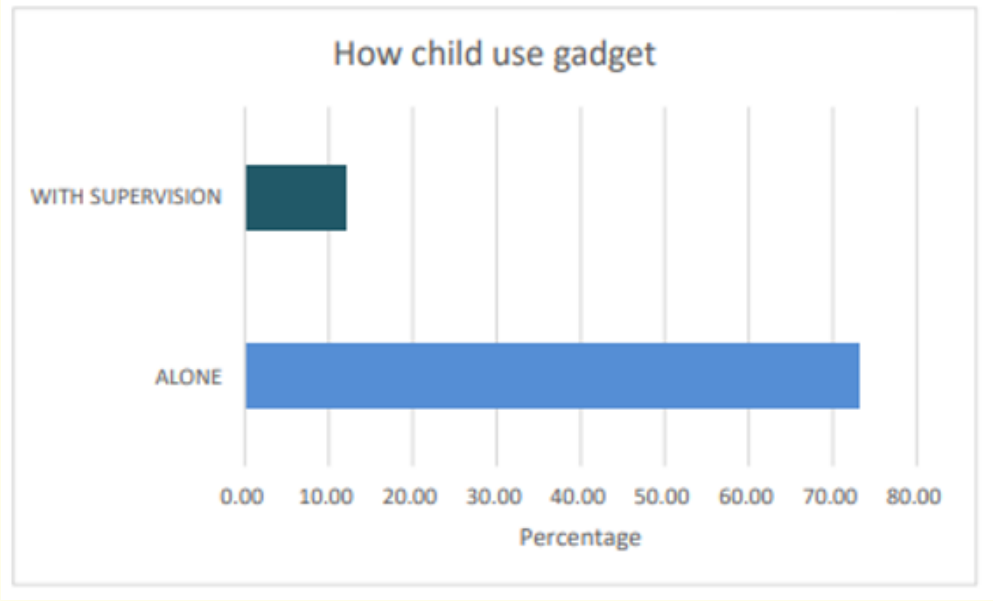

Figure 14: *Parent's supervision while child is using gadget.*

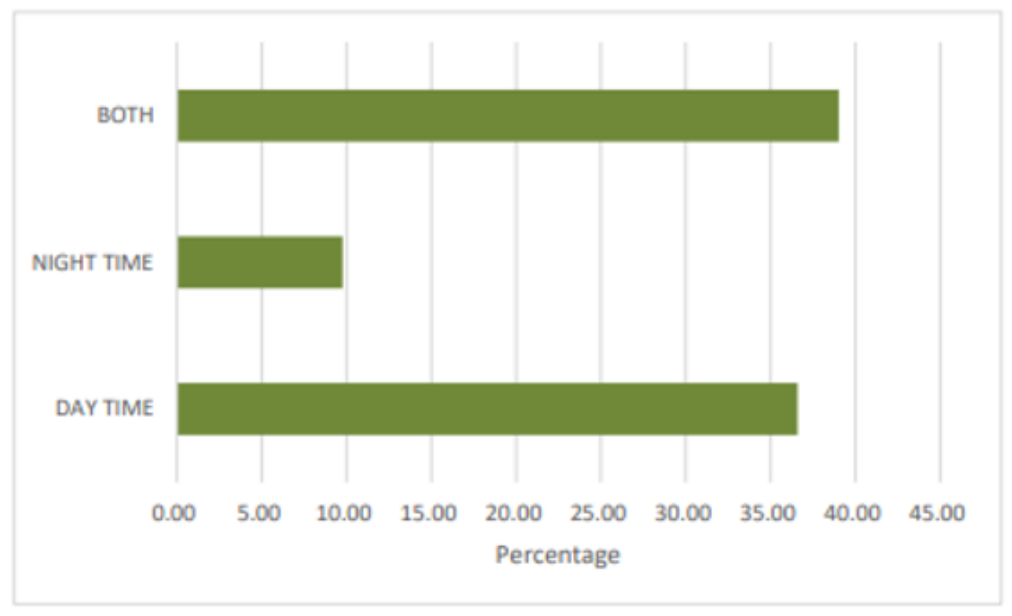

Figure 15: *What time does child use gadget.*

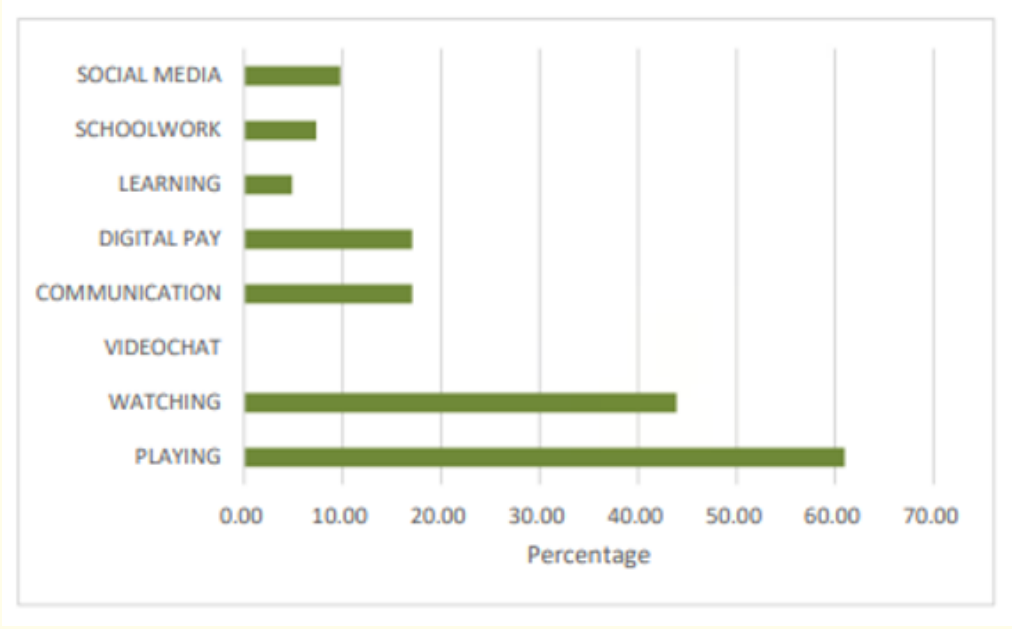

Figure 16: *Reason for using gadget.*

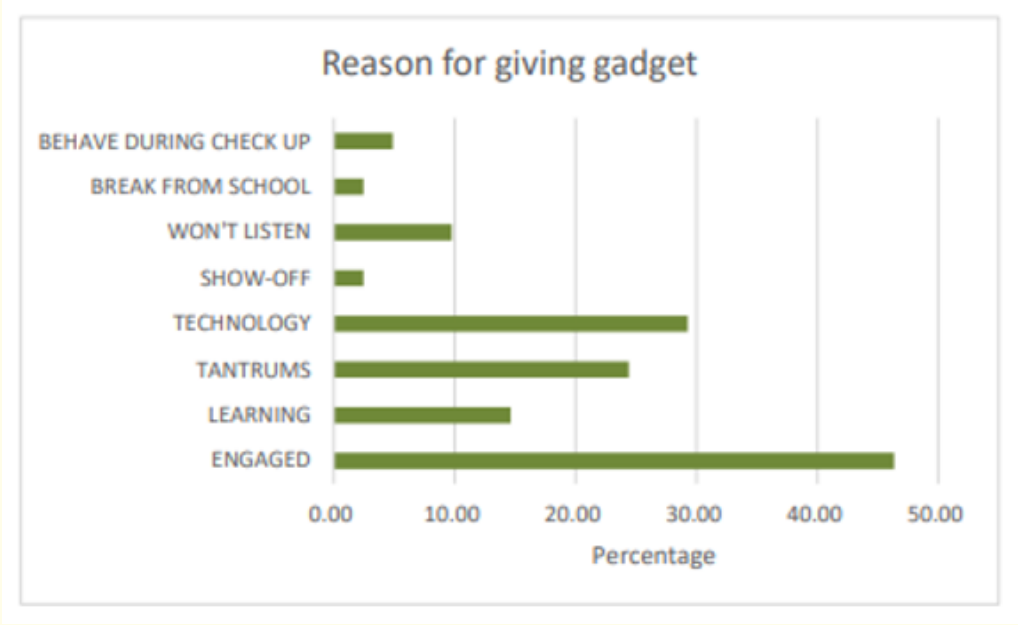

Figure 17: *Reason for giving gadget.*

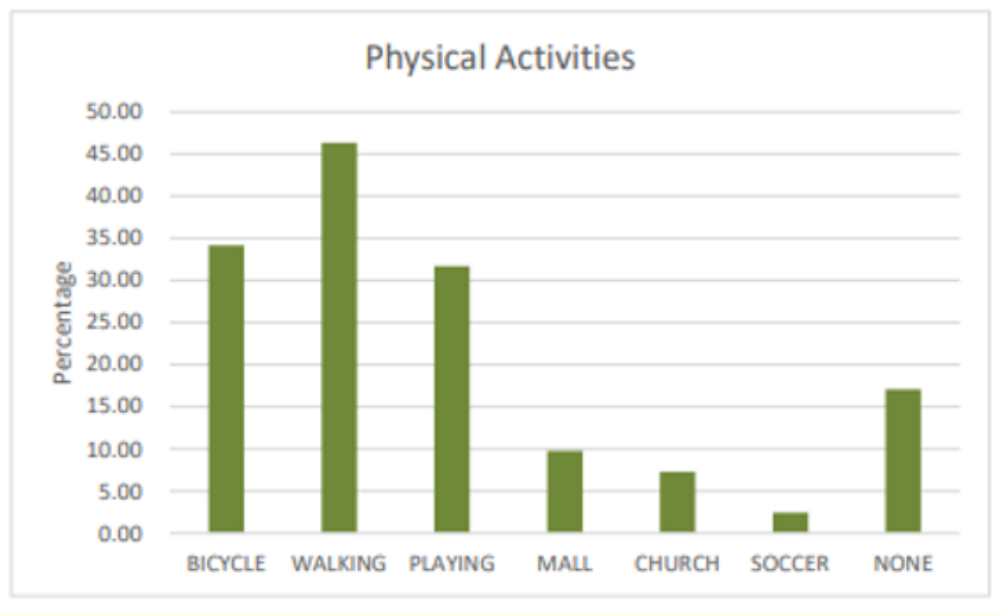

Figure 18: *Physical activities of children.*

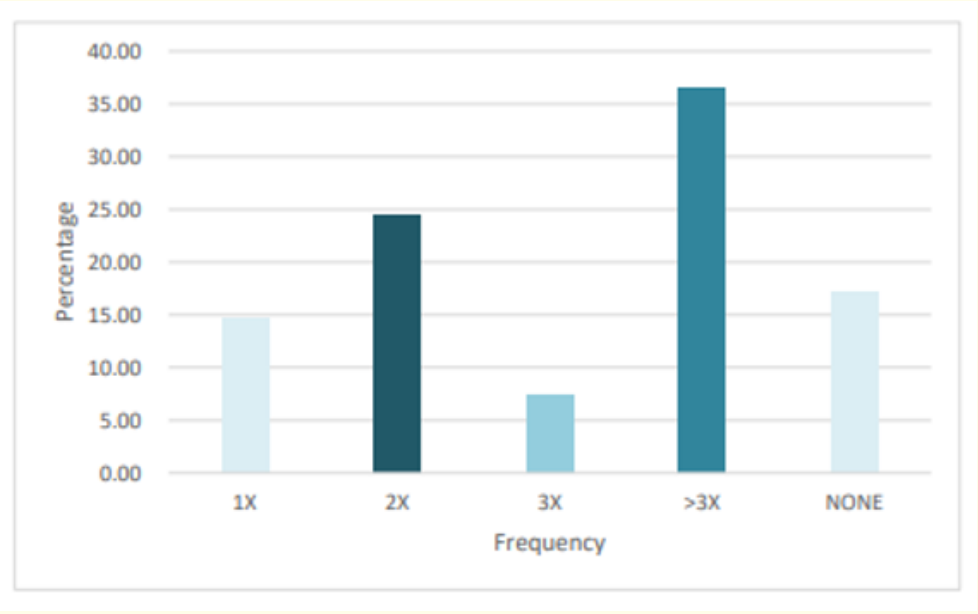

Figure 19: *How often does child have physical activity per week.*

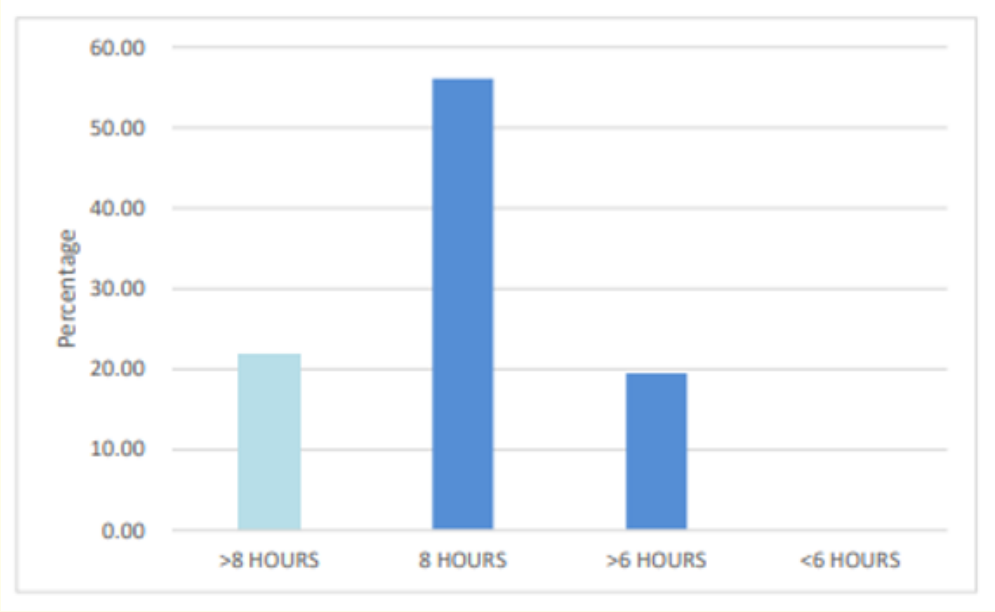

Figure 20: *Child's sleep duration.*

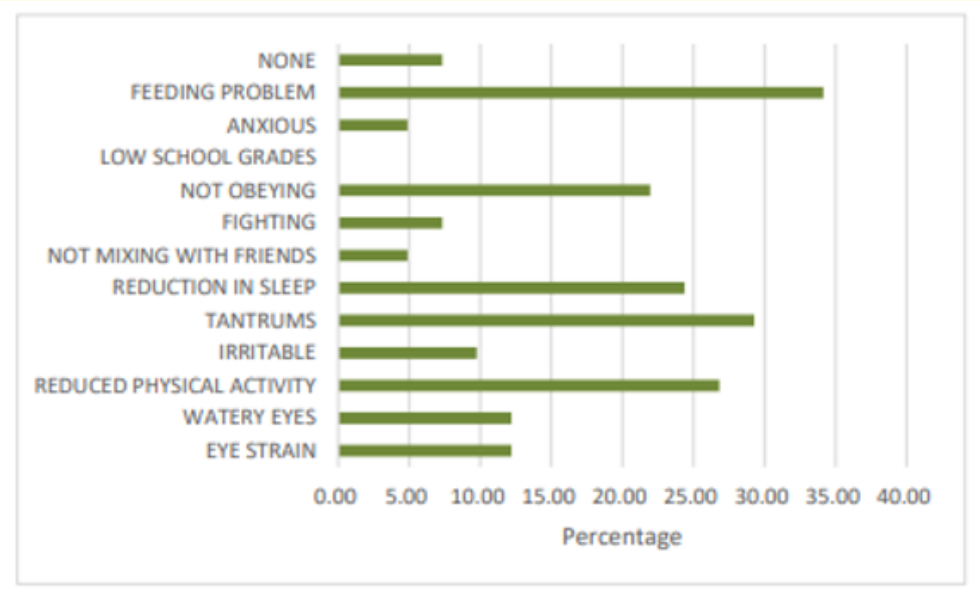

Figure 21: *Problems encountered with child.*

Conclusion

Inconclusion, technology has its advantages and disadvantages. Gadget usage can have physical, social and psychological impacts to children. Still prevention is better than cure.

Parents or guardians must have enough time to supervise, monitor and control their children in using gadgets. Set a limited time duration for usage. The ideal time for children to use gadgets at an early age is 5 - 30 minutes with an intensity of 1 - 2 times per day. Make sure the position of the child playing or using the gadget is correct with the proper lighting and distance of at least 20 inches from the screen to the eye. Implement screen breaks, exercises, wearing of protective glasses, reducing brightness of electronic devices and avoiding small screen phones or gadgets to avoid eye problems.

Encourage children to play outdoors and have regular physical activity to divert children from gadgets. These may include brisk walking, running, and playing sports.

Recommendation

Since this research focused more on the negative effects of gadget usage, a long term study on the positive effects is highly suggested. It is also recommended to comparing government and private hospital children. Although the subjects in this study were multi-nationality.

Acknowledgement

This study was made possible through the cooperation of the parent/guardians of my patients by answering the questions asked during history taking.

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