Touch Screen Device Usage and its Effect on Sleep among Young Children: Do Parents Delude Younger Generation Deliberately? Time to Ruminate and Impede this Technological Harm

Hepsi Bai Joseph, K. Sandhiya, Asha P Shetty
Department of Pediatric Nursing, College of Nursing, All India Institute of Medical Sciences, Bhubaneswar, Odisha, India

Abstract

**Context:** The American Academy of Pediatrics had recommended that children younger than 2 years should avoid digital media. However, in the Indian context, it was less explored.

**Aims:** The study aimed to determine the relationship between touch screen device (TSD) usage and sleep of infants, toddlers.

**Methodology:** Using a cross-sectional design, 76 parents of infants and toddlers attending well-baby clinic of a tertiary care hospital in Eastern India were approached, and 57 parents who fulfilled the eligibility criteria were selected using a nonprobability convenient sampling technique. Data were collected using a pretested validated tool including TSD usage pattern, the brief infant sleep questionnaire. Descriptive statistics and Pearson correlation were used to analyze the data.

**Results:** The mean age of TSD usage was 15.6 ± 5.8 months with a mean duration of 65 ± 9.6 min/day. Mothers (51%) reported circumstances to offer TSD was feeding the child. There was a significant negative relationship between night sleep and TSD usage among children ($r = −0.35, P < 0.01$).

**Conclusions:** TSD usage time significantly affects the nighttime duration of sleep of infants and toddlers. Parents to be educated on proper usage and ill effects of TSD to prevent sleep issues.

**Keywords:** Infants, parents, sleep, toddlers, touch screen device usage

Introduction

Touch screen devices (TSDs), including mobile phones and tablets, are increasingly available and easily accessible to children in many societies. The use of TSD in children has dramatically increased in the past 10–15 years.[1] According to the Indian Academy of Pediatrics guidelines, children <2 years of age should not get any TSD exposure for adequate or proper growth and development.[2] This was emphasized because of risk exposure to the children including violence, sexual content, and irrelevant advertisement according to the age. Sleep plays a vital role in adequate neurodevelopment and synaptic plasticity among infants and toddlers.[3] The more prevalent issues presented to pediatricians by parents are infant-toddler sleep problems.[4] Sleep during the nighttime was the rapid maturational process that occurs in infants.[5] However, nearly 20% to 30% of all infants and toddlers fail to maintain their sleep, it is fragmented, evidenced by night waking, and extend as a sleep problem during toddler and preschooler period. If it is not considered and treated early, it may continue with tantrums and behavioral problems until adulthood.[5,6]

In the recent past, India has accelerated in the consumption of types and amounts of media devices. McKinsey reported that India stands second to China in the fastest-growing markets for digital consumers.[7] For infants and toddlers, the parents act as teachers, gatekeepers, and facilitators toward media consumption. Gentile DA et al. stated healthy screen habits for young children as restricting time spent in media, coviewing

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with child, restricting the content viewed on-screen, and active mediation offering opinions on media content with educating the child on the purpose of various media including advertising and encouraging them to apply practical aspects of the content viewed to daily life.[8] Compared to Western findings on TSD usage in young children, very few studies evaluated screen use, especially infants and toddlers. The relationship of TSD usage on sleep was not explored much in India. Hence, the present study was undertaken to hypothesize the significant relationship between usage of TSD and sleep pattern among infants and toddlers.

**Material and Methods**

The present study adopted a quantitative approach, cross-sectional design to study the pattern of TSD usage, sleep among infants and toddlers. The study was conducted for 2 months period in a well-baby clinic of a tertiary care hospital in Eastern India, where 76 parents were approached, using a nonprobability convenient sampling technique, and 57 were selected as per eligibility criteria. Parents attending well-baby clinics with infants and toddlers (0–3 years) and willing to participate were included. Parents who have TSD at home but not offering it to their infants and toddlers were excluded. The sample size was estimated as 55 based on the proportion of children who used TSD in a previous study by Pagani et al.[9] in Canada, where the prevalence was 11% with 5% margin error and 95% confidence interval. Data were collected using pretested validated self-designed semi-structured questionnaire.

**Pattern of touch screen device usage in children**

It consisted of how frequently and what circumstance infants and toddlers were exposed/offered TSD, parental TSD time, and television time. Parent’s and children’s sociodemographic information were also collected.

**Brief infant sleep questionnaire scale**

It was a validated, standardized scale developed by Dr. Sadeh[10] to measure the sleep problems of infants and toddlers, which is available in the public domain. It consisted of items on nocturnal sleep duration, daytime sleep duration, number of night waking, and duration of wakefulness at night hours. Parents of infants and toddlers were asked to complete the sleep questionnaire referring to the child’s sleep in the past week.

All three tools were submitted to experts for tool validation and found valid (scale-level content validity = 0.81). Cronbach’s alpha was used to determine the reliability among 20 parents, and all the tools were found reliable ($r = 0.88$). The pilot study was performed among ten parents and found the tools were feasible, practicable, and participants were accessible. Data were analyzed with descriptive and inferential statistics using R software. Ethical clearance was obtained from the Institute Ethical Committee, and permission was obtained from the hospital authority. With informed written consent, the data were collected from parents.

**Results**

Out of 76 parents approached, 57 owned and offered TSD to children. All the participants were the mother (100%) with a mean age of 34.8 ± 3.5 years, and 56% of the children were male and firstborn, 70.2% were from the nuclear family. The mean age of the children was 31.9 ± 15 months. The mean age initiated TSD was 15.6 ± 5.8 months with an average duration of 65 ± 9.6 min/day. Majority of 51 (89.4%) parents offered smartphones, followed by Tablet 6 (10.6%). Parents reported that 40 (70%) children watched television for 35 ± 10 min/day. The circumstances to offer TSD to children was feeding 29 (51%) followed by consoling cry 9 (15.7%) and parents to be engaged in household task 7 (12%). The content watched was videos/songs on YouTube (35%) and watching educational applications/listening to music/YouTube movies (21%). Sleep pattern among infants and toddlers showed that 51 (89.5%) had <12 h of sleep at night (9 ± 5 h) [Table 1]. There was a significant negative correlation between TSD usage time and sleep duration at night among children ($r = −0.35, P = 0.007$) [Table 2]. Regression analysis revealed that for every unit increased in TSD usage time, 17.5 effects on night sleep duration (beta = −17.5, SE = 6.2, $P < 0.01$) [Table 3].

**Discussion**

**Pattern of touch screen device usage**

Out of 76 families surveyed, 73 (96%) had reported owning TSD at home. A report from the UK stated a drastic rise in TSD owned by the family from 7% in 2011 to 71% in 2014.[10] The mean age of initiating TSD usage among infants and toddlers was 15.6 ± 5.8 months with 65 ± 9.6 min/day. In the
Adjusted Meta‑analysis conducted on TSD usage and its effect on sleep in young children (Table 2). It is consistent with a study in the UK that increased touchscreen use was associated with a decreased overall amount of sleep (beta = −0.146, SE = 0.049, P < 0.01). Reviews stated that screen media is an environmental contributor to poor sleep. Meta‑analysis on children and adolescents’ usage of TSD and sleep quality and quantity was influenced by portable TSD. Access to portable screen gadgets during bedtime has evidence of reduced night sleep time with poor quality of sleep. Sleep is the initial activity of infants that plays an important role in neurodevelopment and synaptic plasticity. TSD can affect development, impacting the brain and cognition during this critical period of early development. Screen device usage can directly displace the time children have sleep availability, leading to a later bedtime and shorter nighttime sleep duration. The light emitted by TSD can directly affect the circadian rhythm and melatonin suppression, which indirectly affects the arousal level during sleep. The content watched in the screen devices may also elevate psychological and physiological arousal, making it more difficult for children to fall asleep and affecting sleep quality.

The study’s strength is that there were no Indian studies conducted on TSD usage and its effect on sleep in young children. It also recommends studying the long-term impact of TSD on sleep with a large sample size, including the brightness level of TSD used for children.
Conclusions
In this modern era, total restriction of TSD is not possible, but limiting young children to early exposure to TSD can be implemented by the parents as per pediatric guidelines. Our finding also specifies the necessity of an in-depth understanding of the positive and negative impact of using TSD among young children. Family mindfulness to use screen time and role modeling in healthy screen use will be helpful.

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Conflicts of interest
There are no conflicts of interest.

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