

Association Between Screen Time and Sleep Habits among Preschool Children in Selected Urban Communities: A Community-Based Cross-Sectional Study

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Abstract:

Background: Screen-based devices, including televisions, smartphones and tablets, are increasingly used by young children. Excessive or poorly timed screen exposure may be associated with delayed bedtimes, shorter sleep duration and irregular sleep routines. Understanding screen-use patterns and sleep habits is important for promoting healthy development during early childhood.

Materials & Methods: A quantitative, descriptive correlational cross-sectional study is proposed among 100 preschool children aged 3–5 years and their parents or primary caregivers in selected urban communities. Data will be collected using a structured caregiver-reported questionnaire covering sociodemographic characteristics, screen-use patterns, bedtime routines, sleep duration and night-time awakenings. Descriptive statistics and appropriate tests of association will be used to analyse the data.

Results: The numerical findings in this draft are simulated examples for manuscript preparation only. In the illustrative dataset, 38% of children had daily screen exposure of less than one hour, 37% had exposure of 1–2 hours and 25% had exposure exceeding two hours. In the same hypothetical dataset, 40% of children were reported to have a regular bedtime routine. Actual findings must be calculated from data collected under an approved research protocol.

Conclusion: Assessing screen-time patterns and sleep habits may help identify opportunities for early childhood health education. Parents, community health nurses and childcare educators can promote age-appropriate screen use, consistent bedtime routines and healthy sleep environments. A cross-sectional study can identify associations but cannot establish that screen exposure causes sleep problems.

Keywords: Pediatric nursing, preschool children, screen time, sleep habits, child health, parental awareness, community health nursing.

INTRODUCTION

Early childhood is an important period for physical growth, cognitive development, emotional regulation and the development of healthy daily routines. Adequate sleep supports learning, attention, behaviour and overall well-being. Sleep requirements vary with age, and preschool children generally require approximately 10–13 hours of sleep per 24 hours, including naps, according to widely used paediatric sleep recommendations. [1]

Digital devices such as televisions, smartphones and tablets have become common in many households. These devices may be used for entertainment, communication, educational activities and keeping children occupied while caregivers

complete daily responsibilities. Although digital media can provide educational opportunities when appropriately selected and supervised, the duration, timing and content of screen exposure are important considerations in early childhood.

Screen use close to bedtime may interfere with sleep routines by delaying bedtime, increasing mental stimulation or displacing activities that support sleep. Bright light from screens may also affect the body's normal sleep-related processes. However, the relationship between screen exposure and sleep is influenced by multiple factors, including parenting practices, household routines, childcare schedules, physical activity and the child's individual needs.

The World Health Organization recommends limiting sedentary screen time for young children and encouraging active play, adequate sleep and age-appropriate daily routines. [2] These recommendations highlight the importance of considering children's daily activities as a whole rather than focusing on screen exposure in isolation.

Parents and caregivers play a central role in shaping children's screen habits and sleep routines. Consistent bedtime schedules, calming pre-sleep activities, reduced evening screen exposure and a comfortable sleeping environment may support healthier sleep patterns.

Community health nurses and paediatric nurses can contribute by providing anticipatory guidance to parents, assessing children's routines during health visits and promoting healthy digital-media habits. Assessing local screen-use patterns and sleep-related indicators can help identify the educational needs of families.

Therefore, the proposed study aims to assess screen-time patterns and sleep habits among preschool children and examine their association in selected urban communities.

OBJECTIVES

1. To assess daily screen exposure among preschool children aged 3–5 years.
2. To assess selected sleep-related indicators, including sleep duration, bedtime regularity and night-time awakenings.
3. To examine the association between daily screen exposure and selected sleep-related indicators.
4. To describe parental practices related to screen use before bedtime.
5. To identify selected family and environmental factors associated with screen exposure and sleep habits.

RESEARCH HYPOTHESES

H₀: There is no statistically significant association between daily screen exposure and selected sleep-related indicators among preschool children.

H₁: There is a statistically significant association between daily screen exposure and at least one selected sleep-related indicator among preschool children.

These hypotheses should be tested using actual data and an analysis plan established before data collection.

MATERIALS AND METHODS

Research Approach

A quantitative research approach will be adopted.

Research Design

A descriptive correlational cross-sectional design will be used. Screen exposure and sleep-related indicators will be assessed during the same study period.

Research Setting

The proposed study will be conducted in selected urban communities. The final protocol should specify the city, community names, recruitment sites and data-collection dates.

Study Population

The target population will comprise preschool children aged 3–5 years and their parents or primary caregivers residing in

the selected communities.

Parents or primary caregivers will provide information about the child's usual screen use and sleep habits.

Sample Size

A sample of 100 preschool children and their primary caregivers is proposed for this illustrative protocol. The final sample size should be justified using the primary outcome, anticipated prevalence or effect size, confidence level, desired precision, sampling design and expected non-response.

If the principal objective is to test an association, the sample-size calculation should account for the expected magnitude of that association and the selected statistical test.

Sampling Technique

A probability-based sampling method is preferable where a suitable sampling frame is available. If convenience sampling is used, the limitation in representativeness should be clearly acknowledged.

Only one eligible caregiver should complete the questionnaire for each child to avoid duplicate observations.

Inclusion Criteria

- Children aged 3–5 years residing in the selected community.
- A parent or primary caregiver who can provide information about the child's routine.
- Caregivers willing to participate and provide informed consent.
- Children whose caregivers can complete the questionnaire in an approved language.

Exclusion Criteria

- Caregivers who decline participation.
- Children outside the specified age range.
- Caregivers unable to provide sufficient information about the child's usual screen use and sleep routine.

Children with diagnosed health or developmental conditions should not automatically be excluded. If such conditions could affect sleep or screen use, they should be handled through prespecified eligibility criteria or measured as relevant covariates, where appropriate and ethically justified.

Research Instrument

Data will be collected using a structured caregiver-reported questionnaire with the following sections.

Section I: Sociodemographic and family information

Section II: Screen-time patterns

This section will assess:

- Average daily screen exposure on a typical weekday.
- Average daily screen exposure on a typical weekend day.
- Types of devices used, such as television, smartphone or tablet.
- Whether the child uses screens independently or with an adult.
- Screen use during the hour before bedtime.
- Main reasons for screen use, including entertainment and educational activities.

- Whether the family has established screen-use limits.

Section III: Sleep-related indicators

This section will assess:

- Usual bedtime and wake-up time.
- Estimated total sleep duration over 24 hours, including naps.
- Regularity of bedtime.
- Difficulty settling to sleep.
- Frequency of night-time awakenings.
- Reported difficulty waking in the morning.
- Use of a consistent bedtime routine.

Section IV: Parental practices

This section will assess whether caregivers set screen-time limits, avoid devices during bedtime routines, supervise content, encourage active play and maintain consistent sleep schedules.

Data Collection Procedure

After obtaining ethics approval and permission from relevant community authorities, eligible caregivers will be approached and informed about the study.

Written informed consent will be obtained before data collection. Caregivers will complete the questionnaire or participate in a structured interview, depending on literacy, language and study requirements.

The researcher will explain how to estimate screen exposure and sleep duration, including the treatment of naps and simultaneous device use. No identifying information beyond what is necessary for the approved protocol will be collected.

Completed questionnaires will be checked for completeness and entered into a secure, de-identified dataset.

Validity and Reliability

The researcher-developed questionnaire should be reviewed by experts in paediatric nursing, community health nursing, child development and research methodology.

A pilot study should be conducted with caregivers who will not be included in the final sample. The pilot should evaluate

comprehension, feasibility, completion time and the clarity of screen-time and sleep questions.

If a validated sleep questionnaire is incorporated, the research team should verify its suitability for the children's age range, language version, scoring instructions and permissions.

Reliability estimates should be reported only when calculated from appropriate data.

Ethical Considerations

- Obtain approval from the relevant Institutional Ethics Committee before recruitment.
- Obtain informed consent from each parent or primary caregiver.
- Protect the privacy of children and caregivers.
- Do not collect unnecessary identifying information.
- Store data securely and restrict access to authorised research personnel.
- Ensure that participation is voluntary and withdrawal carries no penalty.

Statistical Analysis

Data will be analysed using appropriate statistical software.

- Frequencies and percentages will describe categorical variables.
- Mean and standard deviation, or median and interquartile range, will summarise numerical variables as appropriate.
- Screen exposure should be calculated according to the prespecified method for weekdays and weekends.
- Chi-square or Fisher's exact tests may be used to examine associations between categorical screen-time groups and sleep-related categories.
- Correlation or regression analysis may be considered for continuous screen-time and sleep-duration variables if assumptions and sample size permit.
- Potential confounders, such as age and childcare attendance, should be considered in the analysis plan where appropriate.

RESULTS

Table 1. Distribution of Children According to Selected Characteristics (Illustrative Data, N = 100)

Variable	Frequency	Percentage
Age		
3 years	30	30%
4 years	35	35%
5 years	35	35%
Gender		
Male	52	52%
Female	48	48%
Childcare attendance		
Attends preschool or childcare	72	72%
Does not attend	28	28%

Table 2. Distribution According to Average Daily Screen Exposure (Illustrative Data, N = 100)

Average daily screen exposure	Frequency	Percentage
Less than 1 hour	38	38%
1–2 hours	37	37%
More than 2 hours	25	25%
Total	100	100%

Table 3. Screen Use During the Hour Before Bedtime (Illustrative Data, N = 100)

Screen use before bedtime	Frequency	Percentage
Regularly	32	32%
Sometimes	38	38%
Never or rarely	30	30%
Total	100	100%

Table 4. Distribution According to Selected Sleep-Related Indicators (Illustrative Data, N = 100)

Sleep-related indicator	Frequency	Percentage
Sleeps 10–13 hours per 24 hours	60	60%
Sleeps less than 10 hours per 24 hours	30	30%
Sleeps more than 13 hours per 24 hours	10	10%
Has a regular bedtime routine	40	40%
Caregiver reports frequent difficulty settling to sleep	28	28%
Caregiver reports frequent night-time awakenings	22	22%

DISCUSSION

The proposed study examines screen-use patterns and sleep habits among preschool children, two aspects of daily life relevant to early childhood health promotion.

The illustrative results demonstrate how a study can describe total screen exposure, evening device use and sleep-related indicators. If actual data reveal that children with greater screen exposure also have shorter sleep duration or less regular bedtimes, the finding would support further investigation of these behaviours. It would not establish that screen exposure caused the observed sleep pattern.

Research on digital media and child sleep has identified possible associations between screen exposure and sleep outcomes, although findings vary by age, device, content, timing and study design. [3,4] This variation highlights the importance of collecting detailed information rather than relying only on a single measure of total daily screen time.

The findings should be compared with relevant paediatric research and interpreted in light of the study's sample, setting and questionnaire. Differences between studies may reflect variation in participant age, screen-time definitions, cultural practices and sleep-measurement methods.

Implications for Paediatric and Community Health Nursing

Paediatric Nursing

Paediatric nurses can ask caregivers about children's screen exposure, bedtime routines and sleep duration during routine health encounters. They can provide age-appropriate guidance and encourage discussion of persistent sleep difficulties.

Community Health Nursing

Community health nurses can provide parent education through home visits, community meetings, childcare centres and child-health programmes. Practical guidance can include consistent bedtime routines, suitable screen limits and alternatives such as reading, storytelling and active play.

Parental Education

Caregivers may benefit from guidance on creating a predictable bedtime routine, avoiding stimulating screen activities before sleep and keeping devices out of the child's sleeping area when feasible.

Nursing Education

Nursing curricula can include early childhood sleep, digital-media use, parental counselling and the assessment of developmental and behavioural routines.

Nursing Research

Future studies may evaluate parent-education interventions, compare screen-use patterns across communities or examine the relationship between evening screen exposure and sleep outcomes using longitudinal methods.

RECOMMENDATIONS

1. Conduct larger studies across multiple communities and childcare settings.
2. Use a sampling strategy appropriate to the research objectives and target population.
3. Record weekday and weekend screen exposure separately.
4. Consider validated, age-appropriate instruments for assessing sleep where feasible.
5. Conduct longitudinal studies to examine changes in screen use and sleep over time.
6. Evaluate parent-education interventions using appropriate study designs.
7. Explore the role of caregiver practices, household routines and childcare attendance.
8. Provide practical, evidence-based guidance to families without blaming caregivers for difficulties caused by wider social or environmental constraints.

CONCLUSION

Screen use and sleep habits are relevant areas of early childhood health promotion. Assessing these behaviours among preschool children can help identify family education needs and support healthy daily routines. Paediatric and community health nurses can contribute by providing practical guidance to parents and encouraging age-appropriate screen use, regular bedtime routines and adequate sleep.

A community-based cross-sectional study can describe patterns and examine associations, but it cannot demonstrate that screen exposure causes sleep difficulties. The numerical findings presented in this draft are simulated examples and

must be replaced with actual research data before any claim is made about the selected community.

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