Project iBaby

ECDA Early Childhood Conference
20th September 2014
The Incredible early years: Supporting Young Children’s Development
Singapore Expo Convention & Exhibition Centre
A generation of children glued to screen devices
Turn off that tech toy

How to manage screen time

Screen time should not compromise parent-child interactions, say doctors.

Here is some advice from paediatricians and Project iBaby researchers on how parents can manage their children’s screen time.

1. Set limits

Screen time should not compromise parent-child interactions, say doctors.

There is a link between screen time and children’s ability to think critically,

and to express milk most of the time."

Mrs Lee said she first allowed Kristy to

Turn off that tech toy

Mrs Lee is aware of the possible

turn-off time for TV or other devices in

Around two, but the time spent on it was

It turns out that she used her smartphone even

Continuing to use the device despite negative

The pe

Dr Tan said there are two reasons for

As smartphone addiction is not an established

Screen time may be unavoidable today but parents have the power

to manage their children’s exposure to tablets, TVs and computers

Warning signs

It is not only young children who are at risk of becoming too attached to small devices. Older children and adults can become hooked on such devices too. The main difference between a heavy smartphone user and a problematic smartphone user is that for the former, the use does not interfere with his work, relationships or sleep. For the latter, he is almost constantly thinking about the benefits of screen time, often accessing apps to satisfy his urge.

There is no universal agreement as to the specific criteria for 'smartphone addiction', but it is likely to be a mental disorder or, indeed, whether it is a disorder at all. As smartphone addiction is not an established mental disorder, there is no consensus on what treatments should be applied to problematic

NIP IT IN THE BUD

The following are some tips on how parents can limit their children’s screen exposure time:

1. Set limits

Screen time should not compromise parent-child interactions, say doctors. For instance, he would tell himself that he would

Every child needs to have a balance in their lives. Setting screen

Limit screen time to an hour or two

In the bedroom.

Making and enforcing rules to limit

For children above two years old, TV

For children above two years old, TV

Moreover, their health may be

For children above two years old, TV

As smartphone addiction is not an established

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As smartphone addiction is not an established
“Our findings highlight that exposure to screen devices is highly prevalent and that awareness about the detrimental health effects is limited.”

“Early and heavy screen-time exposure can result in a higher rate of attention deficit when a child is of school-going age and result in language delays if parent-child interactions are compromised as a result of screen-time.”

Dr Falk Mueller-Riemenschneider
NUS Saw Swee Hock School of Public Health

Dr Jennifer Kiing
Paediatrics, National University Hospital
What is screen time?

Screen time

Television programs
Prerecorded videos
Web-based programming
DVDs
viewed on either traditional or new screen technologies

Questions for today
What is so bad about screen time?
Early childhood media exposure is associated with multiple detrimental effects spanning the various developmental domains.
1) Lower reading, recognition and comprehension scores with daily TV viewing before 3 years

2) 6-fold increased likelihood of language delay with exposure before age 12 months

3) Reduced Communicative Development Inventory (CDI) scores with increased duration of exposure regardless of media platform

1) Background television reduces parent-child interaction and promotes rapid attention shifts in the child

2) Inverse relationship between TV time and time spent with parents/siblings in other activities

1) Increased incidence of **attention deficits**

2) Association with **aggressive behaviour**


• Obesity

• **Myopia** – rising myopia rates

• **Sleep** – Irregular sleep schedules with negative impact on growth, behavior and cognitive development


“American Academy of Pediatrics discourages screen time in children younger than 2 years"

– AAP 2011 guidelines

Study Objectives

- **Understanding** screen time behavior among Singaporean children up to 2 years old

- **Characteristics** of screen time behavior

- Determine **factors** influencing screen time behavior
Study Design

- Cross sectional study
- Interviewer administered questionnaire
- Two polyclinics
- February 2014
Study Population

• **Inclusion:**
  - Parents of children up to the age of two
  - Developmental assessment or vaccination clinics

• **Exclusion:**
  - Non parental caregivers
  - Visits for other reasons
  - Non Singaporean or non permanent residents
Study Flowchart

Total Visits (n=1061)

Excluded (n=250)
- Age >2 years (n=113)
- Non Singaporean/PR (n=46)
- Attempted before (n=37)
- Reasons other than DA (n=54)

Eligible (n=811)

Rejected (n=71)
- Time constraints (n=24)
- Not keen (n=47)

Agreeable (n=740)

Response rate >90%
## Sociodemographics of study participants

### Children
- About half were male
- Majority were Chinese

### Parents
- Majority were Married

### Study Cohort Sociodemographic Data

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Child Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (n=738)</td>
<td>403</td>
<td>54.6</td>
</tr>
<tr>
<td>Female</td>
<td>335</td>
<td>45.4</td>
</tr>
<tr>
<td><strong>Child race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chinese (n=739)</td>
<td>431</td>
<td>58.3</td>
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<tr>
<td>Malay</td>
<td>201</td>
<td>27.2</td>
</tr>
<tr>
<td>Indian</td>
<td>83</td>
<td>11.2</td>
</tr>
<tr>
<td>Eurasian</td>
<td>3</td>
<td>0.4</td>
</tr>
<tr>
<td>Others</td>
<td>21</td>
<td>2.8</td>
</tr>
<tr>
<td><strong>Parents Marital Status</strong> (n=740)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>725</td>
<td>98.0</td>
</tr>
<tr>
<td>Single</td>
<td>12</td>
<td>1.6</td>
</tr>
<tr>
<td>Divorced</td>
<td>2</td>
<td>0.3</td>
</tr>
<tr>
<td>Widowed</td>
<td>1</td>
<td>0.1</td>
</tr>
</tbody>
</table>
Sociodemographics of study participants

- Most parents had education level of diploma and above
  - Father - 68.1%
  - Mother - 66.3%
- Dichotomized into high vs low education for subsequent analyses

<table>
<thead>
<tr>
<th>Paternal Education (n=734)</th>
<th>Number</th>
<th>%</th>
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<tbody>
<tr>
<td>Primary</td>
<td>26</td>
<td>3.5</td>
</tr>
<tr>
<td>Secondary</td>
<td>125</td>
<td>17.0</td>
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<tr>
<td>Post-secondary</td>
<td>83</td>
<td>11.3</td>
</tr>
<tr>
<td>Diploma</td>
<td>237</td>
<td>32.3</td>
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<tr>
<td>University</td>
<td>188</td>
<td>25.6</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>75</td>
<td>10.2</td>
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</table>

<table>
<thead>
<tr>
<th>Maternal Education (n=737)</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>25</td>
<td>3.4</td>
</tr>
<tr>
<td>Secondary</td>
<td>154</td>
<td>20.9</td>
</tr>
<tr>
<td>Post-secondary</td>
<td>69</td>
<td>9.4</td>
</tr>
<tr>
<td>Diploma</td>
<td>216</td>
<td>29.3</td>
</tr>
<tr>
<td>University</td>
<td>213</td>
<td>28.9</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>60</td>
<td>8.1</td>
</tr>
</tbody>
</table>
### Sociodemographics of study participants

- **Median Income was between SGD 3001 - 6000**
- **Median Housing type is a 4 room HDB flat**

<table>
<thead>
<tr>
<th>Income (SGD)</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;3000</td>
<td>141</td>
<td>19.1</td>
</tr>
<tr>
<td>3001 – 6000</td>
<td>300</td>
<td>40.5</td>
</tr>
<tr>
<td>6001 – 9000</td>
<td>171</td>
<td>23.1</td>
</tr>
<tr>
<td>9001 – 12000</td>
<td>67</td>
<td>9.1</td>
</tr>
<tr>
<td>&gt;12 000</td>
<td>45</td>
<td>6.1</td>
</tr>
<tr>
<td>Don’t Know</td>
<td>16</td>
<td>2.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Housing</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDB (1 and 2 room)</td>
<td>35</td>
<td>4.8</td>
</tr>
<tr>
<td>HDB (3 room)</td>
<td>105</td>
<td>14.3</td>
</tr>
<tr>
<td>HDB (4 room)</td>
<td>337</td>
<td>46.0</td>
</tr>
<tr>
<td>HDB (5 room/exec)</td>
<td>223</td>
<td>30.4</td>
</tr>
<tr>
<td>Condominium</td>
<td>24</td>
<td>3.3</td>
</tr>
<tr>
<td>Landed</td>
<td>9</td>
<td>1.2</td>
</tr>
</tbody>
</table>
What is the local prevalence of screen time for children aged 2 and under?
Prevalence of screen time?

Almost 1 in 2 children are exposed to screen devices

52.8% have screen time exposure
Prevalence of screen time?

Prevalence of exposure roughly doubles every 6 months

Reaching 87.6% between 18-24 months
Stratified by age group

Significant difference between age groups, P<0.001
Which devices are most implicated?
Device ownership

- 4 in 10 households own one television and one computer
- 8 in 10 households own three or more personal portable devices
  - Mobile phones, tablets, handheld video game device

Table 5: Device Ownership (%)

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>&gt;5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Television</td>
<td>1.0</td>
<td>41.3</td>
<td>32.9</td>
<td>16.7</td>
<td>6.4</td>
<td>0.7</td>
<td>0.9</td>
</tr>
<tr>
<td>Computer</td>
<td>5.6</td>
<td>37.5</td>
<td>33.5</td>
<td>15.0</td>
<td>4.0</td>
<td>2.4</td>
<td>2.0</td>
</tr>
<tr>
<td>Video Games</td>
<td>69.1</td>
<td>25.0</td>
<td>4.4</td>
<td>1.3</td>
<td>-</td>
<td>-</td>
<td>0.1</td>
</tr>
<tr>
<td>Personal Portable Devices</td>
<td>0.1</td>
<td>1.3</td>
<td>20.2</td>
<td><strong>27.2</strong></td>
<td>18.0</td>
<td>13.3</td>
<td>19.9</td>
</tr>
</tbody>
</table>
Type of device used

Majority of time spent on television and personal portable devices

Parallels the trend we observe in Singapore’s public places!
Duration of screen viewing by device

- Majority of time is spent on
  - Television
- Personal portable devices

Table 6: Median Duration of Screen Viewing by device

<table>
<thead>
<tr>
<th>Device</th>
<th>Median (hh:mm)</th>
<th>25%</th>
<th>50%</th>
<th>75%</th>
</tr>
</thead>
<tbody>
<tr>
<td>TV (n=389)</td>
<td>00:30</td>
<td>00:14</td>
<td>00:30</td>
<td>01:27</td>
</tr>
<tr>
<td>Computer (n=388)</td>
<td>00:00</td>
<td>00:00</td>
<td>00:00</td>
<td>00:00</td>
</tr>
<tr>
<td>Video Game consoles (n=388)</td>
<td>00:00</td>
<td>00:00</td>
<td>00:00</td>
<td>00:00</td>
</tr>
<tr>
<td>Personal Portable Devices</td>
<td>00:10</td>
<td>00:00</td>
<td>00:10</td>
<td>00:30</td>
</tr>
</tbody>
</table>
How is sociodemographic data associated with screen time?
Parental education and screen time

<table>
<thead>
<tr>
<th>Parental Education and Screen Time</th>
<th>PRR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Paternal Education</td>
<td>1.22</td>
<td>0.98 - 1.51</td>
</tr>
<tr>
<td>High Paternal Education</td>
<td>1.00</td>
<td>(reference)</td>
</tr>
<tr>
<td>Low Maternal Education</td>
<td>1.49</td>
<td>1.20 - 1.85</td>
</tr>
<tr>
<td>High Maternal Education</td>
<td>1.00</td>
<td>(reference)</td>
</tr>
</tbody>
</table>

Low Maternal Education associated with screen viewing behavior
### Income, Housing and screen time

- **Stratified Income**
  - $SGD6001 and above
- **Stratified Housing**
  - 4 room HDB flat and above
- Families in **larger houses** are associated with **less screen viewing behavior**
- Borderline evidence for income

<table>
<thead>
<tr>
<th></th>
<th>PRR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Income</td>
<td>0.87</td>
<td>0.73 - 1.05</td>
</tr>
<tr>
<td>Low Income</td>
<td>1.00</td>
<td>(reference)</td>
</tr>
<tr>
<td>Larger House</td>
<td>0.84</td>
<td>0.72 - 0.97</td>
</tr>
<tr>
<td>Smaller House</td>
<td>1.00</td>
<td>(reference)</td>
</tr>
</tbody>
</table>
Race and screen time

- Malay and Indian families seem to be associated with screen time behavior

<table>
<thead>
<tr>
<th>Race</th>
<th>PRR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese</td>
<td>1.000</td>
<td>(reference)</td>
</tr>
<tr>
<td>Malay</td>
<td>1.70</td>
<td>1.33 - 2.18</td>
</tr>
<tr>
<td>Indian</td>
<td>1.50</td>
<td>1.00 - 2.24</td>
</tr>
</tbody>
</table>
Child’s gender and screen time

- No differences between gender

<table>
<thead>
<tr>
<th></th>
<th>PRR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>1.00</td>
<td>(reference)</td>
</tr>
<tr>
<td>Male</td>
<td>1.07</td>
<td>0.94 - 1.22</td>
</tr>
</tbody>
</table>
What are the attitudes and practices of local parents?
Positive Association

- Perception that screen time is beneficial to:
  - Cognition: PRR 1.62 (1.38-1.89)
  - Language: PRR 1.13 (1.04-1.22)
  - Social: PRR 1.36 (1.14-1.61)

Negative Association

- Perception that child would mimic aggressive behavior:
  PRR 0.91 (0.84-0.98)
Parental Supervision

4 in 10 parents fail to supervise child’s usage all the time

AAP: Understands that exposure is a reality, therefore recommends supervision of screen time
Awareness of Guidelines

8 in 10 parents are unaware of any professional guidelines
Parental Knowledge of professional guidelines

- Majority of parents were unaware of professional guidelines (85.2%)
- Weak evidence for an association between awareness of guidelines and reduced screen time behavior
- Parents who claimed to be aware were misinformed of the guidelines

<table>
<thead>
<tr>
<th>Parental awareness and Screen Time</th>
<th>PRR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Aware</td>
<td>1.00 (reference)</td>
<td>-</td>
</tr>
<tr>
<td>Aware</td>
<td>0.75</td>
<td>0.53 - 1.07</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reported duration by parents</th>
<th>Correct Answer (minimum screen time)</th>
<th>Wrong Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aware</td>
<td>12.7%</td>
<td>87.3%</td>
</tr>
<tr>
<td>Not Aware</td>
<td>25.5%</td>
<td>74.5%</td>
</tr>
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</table>
Parents who felt a screen device is a good coping tool is associated with increased child screen viewing behaviour.

Association not seen for parents who felt children enjoyed screen devices.

Table 19: Parental attitudes - Other factors

<table>
<thead>
<tr>
<th></th>
<th>OR</th>
<th>95% CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coping tool</td>
<td>1.66</td>
<td>1.23-2.25</td>
<td>0.001</td>
</tr>
<tr>
<td>Child enjoys screen device</td>
<td>1.28</td>
<td>0.897-1.84</td>
<td>0.172</td>
</tr>
</tbody>
</table>

Parents who set rules are associated with reduced child screen viewing behaviour.

Especially where rules are set regarding duration of use.

Table 20: Rule setting

<table>
<thead>
<tr>
<th>Rule Setting</th>
<th>OR</th>
<th>95% CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rule Setting</td>
<td>1.80</td>
<td>1.12-2.88</td>
<td>0.014</td>
</tr>
<tr>
<td>Rules on Time duration</td>
<td>1.12</td>
<td>1.04-1.19</td>
<td>0.002</td>
</tr>
<tr>
<td>Rules on Program use</td>
<td>1.30</td>
<td>0.885-1.91</td>
<td>0.190</td>
</tr>
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</table>
Does screen viewing affect the child’s other activities?
Screen viewing and child’s sleep time

- National Sleep Foundation Recommendation: 13 hours of sleep for children aged under two years
- Screen viewing associated with sleep duration of <13 hours

<table>
<thead>
<tr>
<th>Sleep times for Children</th>
<th>Outcome</th>
<th>PRR</th>
<th>95% CI</th>
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</thead>
<tbody>
<tr>
<td>No screen time</td>
<td>Sleep time &gt;13 hours</td>
<td>1.00 (reference)</td>
<td>-</td>
</tr>
<tr>
<td>Have screen time</td>
<td>Sleep time &gt;13 hours</td>
<td>0.60</td>
<td>0.52 - 0.68</td>
</tr>
</tbody>
</table>
Comparison with international studies

- USA: 90% of children up to the age of two years
- Japan: 86% of children by 18 months of age

Singapore

- Overall prevalence of cohort (with median age 6 months): 52.8%
- Prevalence from 18-24 months: 87.6%
Local Findings

- Lack of parental awareness and misinformation
- Coping tool phenomenon
- Lack of parental supervision
- Health effects of early screen time exposure
Limitations of Study

• Non truly representative sample
  - More data needed from other regions of Singapore, private patients

• No validated instrument locally
  - Carefully crafted questionnaire based on literature review

• Inability to determine causality
The pace of research has not kept up
Need for timely intervention
Public Outreach

• Partnerships

• Media coverage
In a nutshell

Screen Media Use & Child Development

Media exposure is virtually unavoidable in today's society; however, many steps can still be taken to reduce screen time for our young children. Here are some ideas on taking active steps to minimise screen time:

- Review the content that your child is watching and watch the programs with your child.
- Make and enforce rules, limiting screen media usage.
- Encourage other interactive activities that promote proper brain development, such as playing and reading together.
- Watch in the living room only and remove TV sets from child's room.

Screen time has a primarily negative impact on children below the age of 2. Screen time should be kept to a minimum for children below the age of 2.

While the eventual use of screen devices is unavoidable, plan ahead: create concrete strategies to manage screen time.

Whenever possible, review the content that your child is watching and watch the programs with your child.

References:


Baby Fairs to raise awareness at NUH and KKH
Preliminary analysis of utility is promising
GROWing up
Towards a healthier Singapore
Guidance over viewing
Restriction of duration
Other activities
Watch with child
Conclusion

- Detrimental effect of early childhood screen time exposure
- Significant prevalence in children of Singapore
- Intervention needed
Thank you for your attention!

- Ass/Prof. Prof Falk Mueller Riemenschneider
- Dr Tan Chuen Seng
- A/Prof Prof Rob Martinus Van Dam
- CHP group 3 members in YLLSoM
- NHG polyclinics – Dr Angelia Chua, Dr Franco Wong