

## ORIGINAL ARTICLE

# DEVELOPMENT OF A HEALTH EDUCATION MATERIAL ON CHILD MEDIA HABITS

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## ABSTRACT

Early exposure to electronic devices and excessive screen time have shown to be disrupting young children's emotional regulation, and delay their developmental milestone attainment. Hence, it is vital to ensure that parents are informed on practical ways of cultivating healthy child media habits. This study aimed to develop and validate an education material which would serve as guidance to lead an image-based communication to promote healthy child media habits to parents with children under five-years old. The single-paged education material in the form of a flyer was developed based on guidelines and evidence-based recommendations on usage of screen-based media among young children in Bahasa Melayu - the national language of Malaysia. It was validated using the 'Patient Education Material Assessment Tool' (PEMAT) guidelines by seven experts from the related fields, namely Public Health Medicine, Developmental Paediatrics, Family Medicine, Educational Psychology, Social Behavioural Science, and Health Communication. Based on the feedback given by the experts, the flyer underwent three rounds of iterations. Both the components of PEMAT's scoring were good, with understandability reporting an average score of 89.7% and actionability reporting an average score 88.6%. The health education material named "MEDIA" - an acronym which denotes the five components of healthy child media habit is an excellent tool for health promotion in the field of technology and toddlers. This development of a health communication material tailored to local population in this study has contributed to the efforts of ensuring young children thrive in a safe media environment.

**Keywords:** Screen time, Child Media Habits, Health Communication, Health Education, Early Childhood Development

## INTRODUCTION

Early childhood development is largely influenced by experiences underlying social determinants of health comprised of various attributes - from stimulation and support of family to the wider scale of socio-cultural, socio-political, and socio-economic factors. The qualities of environment in which a child grows up in matters most for their milestones' attainment (1). With increased availability and accessibility of electronic devices in homes, electronic media have become an integral part of children's environment as well (2).

Technology has become fundamental to children's lives, impacting various aspects, from academic to socialization (3). Children's earliest screen use experiences are formative for later childhood and beyond (4). However, studies suggest that screen-based media can impact a young child's optimal growth and

functioning as early childhood is a critical phase of brain development during which cognitive abilities such as memory, focused attention, executive functions, and language take place. Early exposure to screen-based media also could interrupt interactions between parents and children, disrupting children's socioemotional development (5).

Effect of screen-based media on children depends on screen time and pattern of usage which includes time of the day child is exposed to screen-based media, types of activity engaged with and situation in which electronic media assistance is relied upon by parents or caregivers. Excessive child screen time is largely contributed by weak enforcement of media rules or monitoring by parents at home, leading to displacement of parent-child interaction, which is fundamental for optimal learning and development in thriving children's first few years of life (2). Hence, it

is vital to ensure that parents are informed on ways of cultivating healthy child media habits and screen-based media is only used at appropriate age - having the best interest of their children in mind (1).

### Health Education Approaches

A systematic review which explored behavioural techniques to reduce child screen time found screen time are recommended to be replaced with other activities as part of recommended health promotion practices (6).

However, despite best efforts by health professionals in giving verbal advice, past literature has established that patients fail to retain much of information relayed, due to poor comprehension and memory. This problem could be overcome by adding written information to the spoken words (7). Past studies tell us that tailored printed material resulted in better recall of information compared to general printed materials and evidence-based traditional educational leaflets were effective in increasing knowledge among target audience (8, 9).

### Study Objective

This study aimed to develop and validate an education material which would serve as guidance for healthcare workers to lead an image-based communication - promoting healthy child media habits to parents with children under five-years old during routine developmental assessment of toddlers in Malaysian health clinics.

## METHODOLOGY

### Development of Health Education Material

The development of health education material in this study is according to the guideline provided by Farrell-Miller and Gentry (1989) which follows these steps (10):

- (i) Needs assessment
- (ii) Developing learning objectives
- (iii) Enhancing readability
- (iv) Establishing content and style
- (v) Developing illustrations
- (vi) Constructing layout and design

Recommendations for designing effective written health education materials by Hoffmann, T. and Worrall, L. (2004) and CDC Clear Communication Index (2014) were incorporated into the steps above for development of an effective written communication material in the form of a brief health education material (11, 12).

### Needs Assessment

Developing individualised education material tailored to the needs of a local population would depend on several factors; namely level of literacy, pre-existing knowledge, socioeconomic and cultural consideration, and information of interest to the target population. Review of available education materials is a crucial component of needs assessment in determining learning deficits and deciding population needs in the domain of interest (10) - ensuring timely and relevant information is provided.

Existing health education in the local setting which is disseminated via the "Child Health Record Book 0-6 years old" used in health clinics nationwide comprise of images in the section of "Parenting skills". Under this section, one of the images shows a young child viewing television and a statement which is not updated based on latest guidelines available on screen time restriction. Traditional media, such as television involves passive viewing in which users are not involved in alteration of media content. Newer digital media which consists of social and interactive media offers users the option of creating media contents actively on their own. Example of newer media includes smartphones and tablets installed with various applications (13). Thus, there exists a need in updating these education materials according to the latest updates of media usage among young children.

Non-adherence to screen time recommendation by international bodies was recorded by 82.2% Malaysian children according to a local study. One in four toddlers were exposed to television and one in ten were exposed to smartphone within their first year of life, with smartphone usage hitting nine hours per day on a typical weekday among children below the age of three (14). According to the Malaysian National Health and Morbidity Survey (NHMS) in 2016, more than half (52.2%) of Malaysian children aged below six years old have excessive screen time exposure - defined as electronic media usage among children below the age of two and screen time exceeding two hours among children between the ages of 24 to 59 months old (15). NHMS 2022 reported 7.4% children below six years old with possible developmental delay, highest in the social domain compared to 3.3% in 2016 (16).

### Developing Learning Objectives

Learning objectives are established to help in determination of content of the health education material and define expected outcome of clients, and provide a method of evaluation. Learning objectives established for development of health education material in this study:

- (i) To inform parents and caretakers on current guideline and recommendations for healthy child media habit.
- (ii) To equip parents with practical skills of adhering to screen time guideline and healthy child media habit.

### Enhancing Readability

Characteristics of text, layout, and design have shown to greatly influence the usefulness and effectiveness of education materials, influencing the readability and determines the quality of education material developed (10). Visual cues such as font type, fonts in bold, font size, heading, choice of colour, alignment and spacing are taken into consideration to emphasise clarity of key messages (12).

### Establishing Content and Style

To establish the content of health education material intended to be developed in this study, existing international guideline, and screen time recommendations for children below the age of five were referred, as follows:

#### (i) World Health Organization

The World Health Organization in its 2019 publication, "Guidelines on Physical Activity, Sedentary Behaviour and Sleep for Children under 5 years of Age" states children below the age of two are not encouraged to have any screen time or exposure to screen-based media. For children aged three and four years old, screen time is urged not exceed one hour; the lesser the better. When sedentary, children of these age group are encouraged to participate in reading or storytelling sessions with caregivers (17).

#### (ii) American Academy of Pediatrics

The American Academy of Pediatrics (AAP) 2016 policy calls for avoidance of screen-based media in children below two-years old and limitation of screen time to not more than one hour per day for children aged between two to five - only if it is classified as "high-quality programming" and co-viewed with parents or caretakers. The policy also states that screen time is not recommended during meals and an hour before sleep. Parents are demanded not to use screen-based media as the only tool to

calm children. Devices contributing to screen time are encouraged to be switched off when not in use (18).

### Other International Recommendations

Australia urges children below the age of two not to be exposed to any screen time at all, whereas children between the ages of two to five are recommended to limit screen time engagement to not more than an hour (19). The Italian Pediatric Society have recommended not more than two hours of screen time per day for children five to eight years old. Media use for children is urged to be prohibited during meals and one hour before bedtime, with no distracting or violent content and not to be used as pacifier to keep children silent (20). The Canadian Sedentary Behaviour Guidelines for Children limits recreational screen time to no more than two hours per day for children five to 17 years old (21).

Based on the available guideline and recommendations, five practical strategies that parents can adapt in improving their children's media habit were identified to be included in the health education material - namely screen time recommendation, discouraging usage of screen-based media during meals or before bedtime, alternative screen-free activities and importance of parent-child interaction and positive stimulation. The practical strategies constructed in the form of statements were translated by the authors into *Bahasa Melayu* - the national language of Malaysia and named "MEDIA" - an acronym which denotes the first word of the five key messages. Sociocultural relevance and suitability of the material for local context were also taken into consideration before finalising the content.

### Developing Illustrations

A graphic designer contributed to the designing of images to reflect the five practical strategies for cultivating healthy child media habits. A few images were drafted for each key message, after which one which best describes each message was chosen. The five images were sketched and edited using Canva application and went through a few rounds of iteration before being finalised.

### Constructing Layout and Design

There are many methods of designing a health education material, including brochures, pamphlets, posters and videos, studies in a review suggest that even passive interventions in primary clinics' waiting areas are influential in improving participants' knowledge, intentions, and behaviours (22). Feedback

received by participants of another study revealed the version of health education material which included photo stories was more noticeable than the non-narrative version (23). Hence, a health education material in the form of a flyer to aid an image-based communication with parents of young children awaiting in the primary healthcare clinics were chosen for this study as it would be simple, time and cost efficient and expected to be impactful for the target population.

Figures 1 and 2 demonstrates the layout and design of the first and second drafts, respectively developed before going through amendments. The designers were generous with white space around the key messages and illustrations to enhance clarity. The flyer contains one main heading, followed by key messages in the form of short and direct statements.

#### **Translation and Content Validity**

The five key messages based on current guideline and recommendations were translated to Malay language, the national language of Malaysia by professionals who are native speakers and was tested on its understandability and actionability using 'Patient Education Material Assessment Tool' (PEMAT) guideline which has demonstrated strong internal consistency, reliability, and construct validity. Understandability in this context defined as how well consumers of varied backgrounds and different levels of health literacy can process and be enlightened on key messages, whereas actionability is how well consumers of diverse backgrounds and different levels of health literacy are able to identify what they can do based on the information presented. Components for evaluation of understandability includes content, word choice and style, use of numbers, organisation, layout and design and use of visual aids - which is comprised of 19

items. Whereas actionability comprise of seven items (24).

A total of seven experts with an academic qualification of doctorate level, at least three years of working experience in their domain, and are involved in the fields related to child health or health promotion were invited to validate the education material. These experts were academicians in the fields of Public Health Medicine, Developmental Paediatrics, Family Medicine, Educational Psychology, Social Behavioural Science, and Health Communication. A mean scoring of above 70 is regarded to be acceptable level of understandability and actionability (25). In this study, only content validity was tested. Construct validity was not applicable, as the material was designed for information delivery rather than to measure an underlying theoretical construct.

#### **Ethical statement**

Ethical approval was obtained from Medical Research and Ethics Committee Ministry of Health (MOH) Malaysia with National Medical Research Registry (NMRR) ID-24-01709-REI (I

#### **RESULTS**

A health education material in the form of flyer (single-paged A4 size) was developed in this study. For PEMAT's understandability component, the scoring by subject matter experts ranged between 73.3% to 100.0% (average score 89.7%), whereas for actionability the scoring ranged between 60.0% to 100.0% (average score 88.6%). PEMAT Scores and additional comments by some of the experts are stated in Table 1.

Based on the feedback received, some amendments were made to the heading, font size, and choice of font colours to highlight key message - yielding the final version of MEDIA in Figure 3.

# MEDIA

## Tabiat Penggunaan Media Elektronik di Kalangan Kanak-kanak



Makan tanpa media elektronik di sisi



Elakkan penggunaan media elektronik sebelum tidur.



Dekatkan diri dengan anak, luangkan masa berkualiti dan tingkatkan komunikasi.



Ikut garis panduan penggunaan media elektronik.

- < 2 tahun: Tiada penggunaan media elektronik
- 2 - 5 tahun: Maksimum satu jam penggunaan media elektronik (dibawah pengawasan)



Aktiviti lain digalakkan sebagai pengganti media elektronik.

Figure 1: First draft of “MEDIA” flyer

# MEDIA

## Tabiat Penggunaan Media Elektronik di Kalangan Kanak-kanak



**M**akan tanpa media elektronik di sisi.



**E**lakkan penggunaan media elektronik sebelum tidur.



**D**ekatkan diri dengan anak, luangkan masa berkualiti dan tingkatkan komunikasi.



**I**kut garis panduan penggunaan media elektronik.

- **< 2 tahun:** Tiada penggunaan media elektronik
- **2 - 5 tahun:** Maksimum satu jam penggunaan media elektronik (dibawah pengawasan)



**A**ktiviti lain digalakkan sebagai pengganti media elektronik.

Figure 2: Second draft of “MEDIA” flyer

Table 1: Understandability and Actionability Score with Expert Comments

| Expert | Understandability (%) | Actionability (%) | Additional comments (if any)                                                                                                       |
|--------|-----------------------|-------------------|------------------------------------------------------------------------------------------------------------------------------------|
| 1      | 85.7                  | 60                | -                                                                                                                                  |
| 2      | 73.3                  | 100               | "A good material that can be improved further, particularly with the choice of words in the headings"                              |
| 3      | 100                   | 80                | "Recommend highlight / bold / larger font for number of hours in the 'I' section to emphasise time limit for parents to adhere to" |
| 4      | 87.5                  | 100               | -                                                                                                                                  |
| 5      | 100                   | 100               | -                                                                                                                                  |
| 6      | 81.25                 | 80                | "Font selection and size of this material could be improved"                                                                       |
| 7      | 100                   | 100               | "The material is very clear"                                                                                                       |

## DISCUSSION

The "MEDIA" flyer despite being a simple single paged health education material developed in a conventional method of delivering health information via printed material shows good level of understandability and actionability for the local Malaysian population. It clearly tells the target population on what they are expected to do with the information provided to them through the five practical strategies in an effort to cultivate healthy child media habits at home (12), also taking into consideration sociocultural needs and sensitivities (8).

The flyer produced through this study outlines five key messages in Malay language which uses active voice and contains only words commonly used, which is easily comprehensible even by population with low level of literacy. Each key message was ensured to have fewer than three syllables to make the text less difficult to read and short sentences which express only one idea per point to ensure it is easy to be followed and decreases complexities. The print fully flows horizontally, enhancing clarity of font for better readability - in line with current recommendations of developing effective health education materials (8, 12).

The health education material, "MEDIA" is an excellent tool for health promotion in the field of technology and toddlers, in alignment with findings from past literature which has shown adding pictures to written language increases focus, comprehension, retention of information and adherence towards learning gained through the material (26). Though

there are various other methods of communicating health information used in past literature; namely via email, phone-based calls, or messages - however, it largely depends on availability of electronic devices and privacy concerns. (8). Infotainment videos on the other hand require time, expertise, and financial sources. Despite strength of the health education material highlighted, there are limitations to be acknowledged as well.

Studies recommend all key stakeholders, including parents in this context should be involved in the development stage of designing health education material (11). This was not done in this study due to limitation of time and resources. Stakeholder engagement would ensure that the material meets the consumers' needs and any additional information for queries could have been included in the flyer if needed. In addition, the current health educational material has only been developed in one language, *Bahasa Melayu* which is the national language in Malaysia. Future studies may be improved by developing materials in other languages spoken by Malaysians, namely English, Mandarin, and Tamil.

The authors also acknowledge that reliance on expert assessment for content validity using PEMAT alone is a study limitation - as it may introduce subjective bias despite the use of standardised evaluation criteria. Expert reviewers may not fully reflect the perspectives, literacy levels, or cultural nuances of the intended audience. Additionally, the material has not been tested in real-world settings, limiting evidence of its



Figure 3: Final version of "MEDIA" flyer

practical applicability and cultural generalisability.

In terms of health education material assessment, there are various methods

employed to ensure the quality and effectiveness of materials developed. One such study assessed health education infographics' usefulness, legibility, graphics and illustrations and aesthetics (27). The

element aesthetics were not given importance in the assessment of “MEDIA” flyer in the study, however layout and design and use of visual aids were part of PEMAT’s evaluation rubric.

Future research should incorporate additional information into health education material on child media habits, particularly on potential effects or consequences of early screen-based media exposure and excessive screen time and barriers towards implementing screen rules or healthy media habits. Words or images which convey this information based on components of health behaviour models could play a crucial role in guiding development of effective health education material (28, 29). Health education material developed also could be pre-tested in the general population through surveys, pre and post interventions or follow-up interviews to further evaluate the material’s clarity, actionability, and cultural relevance (11, 26, 30).

## CONCLUSION

The health education material, “MEDIA” can be an effective communication tool in clinical to complement health consultation or for public health practice during field work. Its concise and straight to the point characteristic makes it an excellent instrument to provide quick explanation, build rapport with audience and suggest adaption of the five key strategies outlined. The health education material which is personalised according to the sociocultural needs of the target population delivers an easily comprehensible narrative with suitable images and comes with a minimal cost for printing and reproduction.

This study, a precedence of a research work in which the effectiveness of the flyer in improving home media environment will be assessed is believed to assist health promotion strategies to improve child media habits and pave the way for the young ones to thrive in a safe media environment.

## DECLARATION OF CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest.

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