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Review Article

A review of media health literacy in children and young people and its associated factors

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Abstract

Media and health literacy are important dimensions that shape health and social behaviors among children and young people. Understanding the factors associated with media health literacy (MHL) is imperative to effectively promote healthy behaviors. This study performed a review, with systematic search, to determine the influential factors associated with MHL among children and young people. The authors searched Scopus, Web of Science, PubMed and Thai Journal Online database for English and Thai language articles, from inception until December, 2020. Of 1,479 articles identified, 1,297 were screened by title and abstract, and 209 full-texts were screened for inclusion criteria of the review. Eight articles, which reported associated factors with MHL for a target population of persons under age 25 years, were included in the analysis. The results show that children and young peoples' MHL was associated with individual factors, e.g., gender, age, education, stress, communication skill, media use, and healthy lifestyle factors, whilst the associated environmental factors are parental attributes and key informants of health information. Factors associated with MHL identified in this study may assist policymakers in appropriately creating interventions for promoting children and youth's MHL and, thus, healthy behaviors and future risk reduction.

Introduction

Media use and health literacy (HL) has become a more important dimension in people's lives as it is a critical factor that shapes health and social behaviors. HL is often defined as means skills of a person and society to access, understand and use information to promote and maintain good health (Nutbeam, 2000). A growing body of evidence suggests that media use could lead to adverse nutritional, psychological, and social conditions in children and young people (Canadian Paediatric Society, 2003). The importance of HL that is a construct of a life-long learning process, starting from early life, is well evident (Nutbeam, 2000). Nowadays, children and youth are growing up immersed in the internet via a variety of devices (Chassiakos, Radesky, Moreno, Cross, & Council on Communications and Media, 2016). Hence, understanding HL through using media can help promote healthy behaviors and reduce future health risks in children and young people.

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Whilst there has been a recent upsurge in publications about factors that influence media use and HL in children and young people, the attention to the complementarity of health literacy and media is still limited. Most research has mainly focused on the effect of media use, media literacy (ML) (defined as the capability to access, analyze, evaluate message and create content and messages or be a producer of media) (Hobbs, 1997) or HL on behavioral or health-related outcomes of children and young people (Cha et al., 2014; Chari, Warsh, Ketterer, Hossain, & Sharif, 2014; Dorey & McCool, 2009). Within health promotion settings, ML and HL have been primarily addressed as separate factors (Higgins & Begoray, 2012). For a child or young person to make sound health decisions when using media, it is important to understand the complementarity of literacy in health and media, especially its associated factors.

Recently, linking or combining HL with ML has gained attention from researchers and policy makers as a strategy for promoting population health. Some research puts ML as one domain of HL, and studies have not always investigated ML independently as an active health-related response to content in media (Manganello, 2008). Another study combined ML and HL and named it "media health literacy (MHL)." This MHL was defined as an individual's ability to identify health content through media, recognize its influence on health behavior, critically analyze the content, and express intention to respond through action (Levin-Zamir, Lemish, & Gofin, 2011).

Despite growing interest in the complementarity of ML and HL, a more specific overview for the synergy of literacy in health and media (referred to as MHL) in relation to understanding factors that shape or influence MHL in children and young people is lacking. The purpose of this review was to add to the body of knowledge and understanding of the factors that influence MHL in children and young people. The review examined a range of different studies across disciplines and study designs. Outcomes of interest will enable further insights into paths for policy-making decisions for appropriate MHL interventions to promote children's and young people's health.

Methodology

The research question used to guide this study was: *What are the influential factors that affect MHL in children and young people (under 25 years)?* Within this research, MHL is regarded as a complementary approach between ML and HL according to previous research. It can include the approach that puts ML as one domain of HL, and the approach that combines ML and HL into an integrated concept.

This review conducted a systematic literature search. Four electronic databases, including Scopus, Web of Science, PubMed and Thai Journal Online database, were mined for relevant literature between June-December 2020. Key search terms were constructed around three concepts: (1) media and health literacy; (2) factors (individual factor(s), physical environment factor(s), social environment factor(s), macro-level factor(s); and (3) children and/or young people (child*, adolescent*, youth*, teen*, young people, young person). The search terms were combined through Boolean operators (AND/OR) and truncations, and wildcard characters to enlarge search results. The search protocol was constructed alongside a university librarian. Search term application differed slightly depending on the database.

Articles were eligible if they: (1) were original research, peer-reviewed, available in English or Thai; (2) focused on generic MHL, as described above; (3) offered relevant content for investigating factors that affect MHL in children and young people; and (4) addressed a population that was aged under 25 years. All study designs were included. Publicly available information was reviewed from inception of the electronic databases to June 2020. Studies conducted with adults and children or youth living with disability or communicable disease were excluded from the review. This study also searched for important references already cited in the included studies.

Figure 1 depicts the search strategy and the selection process. The search identified 1,479 records. After removing duplicates (n = 182), all 1,297 titles and abstracts were screened. Database searches were complemented by hand searches with a cross-check of the referenced lists of studies included for analysis, retrieving two additional articles that entered the selection process.

Data extraction and synthesis

The substance of the relevant articles was qualitatively assessed and synthesized using content analysis. Firstly, eligible studies were scanned for factors that are associated with MHL in children and young people. Secondly, the factors were coded, extracted, and compared by the research team NJ and SP to ensure accuracy and to resolve discrepancies. Thirdly, relevant background information was defined and extracted, including country of study, age of the target group and study design. Finally, the results of the synthesis were discussed among the three authors to come up with a consensus for the final analysis.

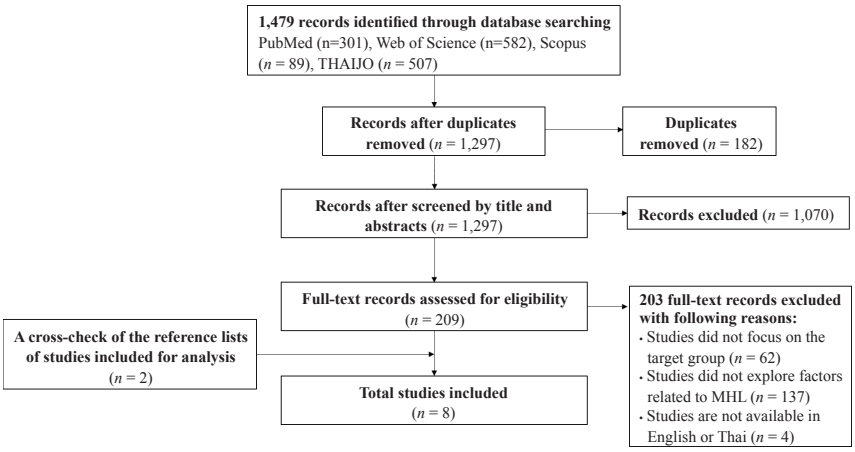

Figure 1 Flow chart for the inclusion of reviewed studies

Results

Eight articles met review criteria. Most of the studies had cross-sectional designs, and one study was qualitative research (Table 1).

Seven studies measured MHL in which ML was a component of HL (Abel, Hofmann, Ackermann, Bucher, and Sakarya, 2014; Choeisuwan & Tansantawee, 2018; Chuaysrinuan, Chaimay, & Woradet, 2020; Intarakamhang & Intarakamhang, 2017; Lattanand & Ninwatcharamanee, 2019; Riesmeyer, Hauswald, & Mergen, 2019; Suwanwaiphatthana, Piromkraipak, & Nawanantawong, 2019). One study measured the combined HL and ML (Levin-Zamir et al., 2011). The most common measure of MHL was reliability and credibility of health information through media (Abel et al., 2014; Choeisuwan & Tansantawee, 2018; Intarakamhang & Intarakamhang, 2017; Lattanand & Ninwatcharamanee, 2019; Levin-Zamir et al., 2011; Riesmeyer et al., 2019; Suwanwaiphatthana et al., 2019). Studies in Switzerland used one question of participants to assess MHL (Abel et al., 2014), while the studies in Thailand (Choeisuwan & Tansantawee, 2018; Chuaysrinuan et al., 2020; Intarakamhang & Intarakamhang, 2017; Lattanand & Ninwatcharamanee, 2019; Suwanwaiphatthana et al., 2019), Germany (Riesmeyer et al., 2019) and Israel (Levin-Zamir et al., 2011) used a set of questions to appraise MHL among adolescents.

Individual factors

Overall, individual factors which are associated with MHL are socio-demographic characteristics (i.e., gender, age, and education), stress, communication skill, media use (i.e., Instagram use), and healthy lifestyle.

Gender, age, and education were found to be associated with MHL. Level of MHL differed significantly by gender among adolescents (Levin-Zamir et al., 2011; Chuaysrinuan et al., 2020; Abel et al., 2014; Suwanwaiphatthana et al., 2019). The Swiss, Israel, and Thai studies found that girls had higher MHL scores than boys (Levin-Zamir et al., 2011; Abel et al., 2014; Suwanwaiphatthana et al., 2019). These results conflict with a study in Thailand that indicated that boys have higher MHL scores than girls (Chuaysrinuan et al., 2020).

For the age factor, the Thai study showed that age was statistically associated with having MHL among students (OR = 2.91, 1.68 to 5.01) which means students who were 12 years old were more likely to have high score of MHL than students who aged ≤10 years (Chuaysrinuan et al., 2020). However, the study in Israel found no association between MHL and age (Levin-Zamir et al., 2011). For the education factor, the studies in Switzerland and Thailand confirmed that there was a positive association between education and MHL. Youth (9–25 years) who had higher education had a higher MHL score than those with lower education (Abel et al., 2014; Choeisuwan & Tansantawee, 2018; Chuaysrinuan et al., 2020; Lattanand & Ninwatcharamanee, 2019;). However, the study in Israel did not find a relationship between education and MHL (Levin-Zamir et al., 2011). Some studies in Thailand also investigated the relationship between Grade Point Average (GPA) and MHL, but found inconsistent results. One study found that GPA was associated with MHL (OR = 3.64, 1.77 to 7.51). Students who had high GPA (≥ 80%) were more likely to have higher score of MHL than students who had low GPA (< 60%) (Chuaysrinuan et al., 2020). However, another study did not find any association between GPA or academic achievement with MHL (Choeisuwan & Tansantawee, 2018).

Table 1 Influence of Factors on MHL

Authors	Year	Country	Study design	Participants	Independent variables
Levin-Zamir, Lemish, and Gofin (2011)	2011	Israel	Questionnaire-based cross-sectional study	• Israeli adolescents (n = 1,260) • Age 13, 15, and 17 years	Individual factors 1. Gender (+) (β = 1.25, p < .001) Environmental factors 1. Mother's education (+) (β = .16, p = .04) 2. A number of health information sources (+) (β = .23, p < .01)
Abel, Hofmann, Ackermann, Bucher, and Sakarya (2014)	2014	Switzerland	Questionnaire-based cross-sectional study	• Swiss citizens (n = 7,983) • Age 18–25 years	Individual factors 1. Gender 2. Own education (+) 3. Own: importance of a healthy lifestyle (+) Environmental factors 1. Parents' education (+) 2. Parents: importance of a healthy lifestyle (+) (both p < .05)
Intarakamhang and Intarakamhang (2017)	2017	Thailand	Questionnaire-based cross-sectional study	• Students (n = 2,000) • Age 9–14 years	Individual factors 1. Communicating skills (+) (β = .83, p < .05) 2. Managing their health conditions (+) (β = .81, p < .05)
Choeisuwan and Tansantawee (2018)	2018	Thailand	Questionnaire-based cross-sectional study	• First- to fourth- year nursing students in Academic Year 2018 (n = 160)	Individual factors 1. Years of study (+) (Cramer's V = .24, p = 0.007) 2. Stress level (-) (r = -.14, p = .038)
Riesmeyer, Hauswald, and Mergen (2019)	2019	Germany	In-depth interviews	• Girls (n = 15) • Age 13–19 years	Individual factors 1. Instagram use Environmental factors 1. Sources of health information 1.1. Parents 1.2. Teachers
Lattanand and Ninwatcharamanee (2019)	2019	Thailand	Questionnaire-based cross-sectional study	• First- to fourth- year nursing students in Academic Year 2018 (n = 419) • Age 18–25 years	Individual factors 1. Years of study (+) (p < .05).
Suwanwaiphatthana, Piromkraipak, and Nawanantawong (2019)	2019	Thailand	Questionnaire-based cross-sectional study	• Students in grade 7–9 (n = 345) • Age 12–15 years	Individual factors 1. Gender (+) (t = -4.10, p < .05).
Chuaysrinuan, Chaimay, and Woradet (2020)	2020	Thailand	Questionnaire-based cross-sectional study	• Students in primary grades 4–6 (n = 374) • Age ≤10–≥12 years	Individual factors 1. Gender (+) (OR = 1.92, 95%CI: 1.19 to 3.10) 2. Age (+) (OR = 2.91, 95%CI: 1.68 to 5.01) 3. GPA (+) (OR = 3.64, 95%CI: 1.77 to 7.51)

Note: (+) referred to positive association, (-) referred to negative association.

There was a negative association between stress level and MHL among college students. The Thai study indicated that nursing students who had high stress had a low summed score of MHL (r = -.14, p = .038) (Choeisuwan & Tansantawee, 2018). For communication skill, young people (9–14 years) with communication skill were likely to have better MHL. One study with Thai children and teenagers found a causal relationship between ability to communicate health information, especially about healthy behaviors for preventing obesity, with their family or friends and level of MHL (Intarakamhang & Intarakamhang, 2017).

Media use was related to MHL of young adolescents (13–19 years). The qualitative study in Germany found a relationship between Instagram use and MHL (Riesmeyer et al., 2019). That study demonstrated how active use of Instagram by girls could have a positive impact on MHL (Riesmeyer et al., 2019). That finding is inconsistent with the findings of the quantitative study in Israel which did not find an association between media exposure (through television, internet, radio, newspapers, pamphlets, and books) with friends, parents, and siblings and MHL among adolescents (Levin-Zamir et al., 2011).

Attitudes towards healthy lifestyle and individual's healthy lifestyle behavior were identified as important factors influencing MHL among young people (18–25 years). The Swiss study analyzed adolescents' attitudes toward a healthy lifestyle, and found that feeling a sense of importance about having a healthy lifestyle was positively associated with sum score of MHL (Abel et al., 2014). The study in Thailand analyzed a causal-relationship model, and measured frequency of managing healthy lifestyle among children to prevent obesity, such as considering the appropriateness of the nutritional value of foods, setting exercise goals, and improving one's environment for better health (Intarakamhang & Intarakamhang, 2017). The study found that there was a significant association between managing a healthy lifestyle (β = .81, p < .05) and ML (as part of HL) (Intarakamhang & Intarakamhang, 2017).

Environmental factor

Overall, parental factors (e.g., parental education, and parents' sense of importance given to a healthy lifestyle), and informants of health behaviors (e.g., parents and teachers) were environmental factors which were perceived to affect MHL among children and young people.

Education of parents and parents' sense of importance of a healthy lifestyle in the family were significantly associated with MHL. Studies in both Israel and Switzerland reported a positive association between parents' education and MHL (Abel et al., 2014; Levin-Zamir et al., 2011) . The Israeli study found that adolescents who had mothers with high education (15 or more years) were more media-health literate compared to those who had less than 12 years of education (β = .16, p = .04) (Levin-Zamir et al., 2011). The findings are consistent with the Swiss study which found that the parents' sense of importance of a healthy lifestyle within the family had a positive association with their child's MHL (Abel et al., 2014).

MHL was related to an adolescent's informants of health behaviors. The Germany study found that having parents or teachers as key informants of health-related behaviors, influenced MHL of young girls (Riesmeyer et al., 2019). This was consistent with the Israel study that MHL was significantly higher among girls (β = 1.13, p < .001) who reported a greater number of key informants (Levin-Zamir et al., 2011).

Discussion

This is a comprehensive review of the literature on factors influencing MHL among children and young people. The review found support for socio-demographic, stress, communication skill, media use, healthy-lifestyle-related and social environmental factors (parental factors, and key informants of health information) which influence a child's and young person's MHL outcomes.

Gender was found to be positively and consistently associated with children's and young people's MHL. Most studies confirmed that girls had higher ability to identify and analyze credibility of health content through media than boys (Abel et al., 2014; Levin-Zamir et al., 2011; Suwanwaiphatthana et al., 2019). This could be due to a primate model of sex-dimorphic behavior which supposes that behavioral differences between the sexes emerge as a consequence of socialization and social structure (Udry, 2000). With respect to abilities under a gender stereotype and traditional gender expectation research, girls do better on verbal tasks and boys are better at spatial tasks (Merrill, Yang, Roskos, & Steele 2016). Girls are almost always found to enjoy reading (which is one domain of literacy) more than boys (Levy, 2016; Whitehead, Capey, Maddren, & Wellings, 1977). Previous studies found that girls do better than boys in literacy, and this is the same for children across the world (Levy, 2016; Twist & Sainsbury, 2009). Literacy skill is seen as having the power to enhance a girl's performance

(Levy, 2016). However, these were inconsistent with the finding reported by Chuaysrinuan et al (2020) indicating that boys have higher MHL scores than girls. This may be explained by influence of media use. Boys were likely to spend more time on the Internet and involve in a broader range of online activities than girls (Dufour et al, 2016). Higher frequency of media use was found to be associated with higher levels of HL and ML among adolescents (Adhiarso & Suyanto, 2018; Tse, Bridges, Srinivasan, & Cheng, 2015) and thus may increase boy's MHL.

An association with educational level and academic performance was found for MHL level. The reviewed studies suggest that young people with higher education or higher GPA were more likely to have higher MHL (Abel et al., 2014; Chuaysrinuan et al., 2020; Lattanand & Ninwatcharamanee, 2019). This might be due to higher cognitive development and sufficient basic skills in reading and writing (Nutbeam, 2000) of children from attaining higher level of education or GPA and, as such, they can understand health information more than those who had lower education or GPA. However, when the analysis included both education and other environmental factors, there was no association between education and MHL (Levin-Zamir et al., 2011). MHL can be influenced by contextual factors such as family members, friends, teachers, community, institutions, and public policy (Levin-Zamir & Bertschi, 2018). Further research should investigate the association between individual and environmental factors, and MHL.

This study found a negative association between stress and young people's MHL (Choeisuwan & Tansantawee, 2018). It is evident that excessive stress could impair the biological and cognitive abilities of an individual to function effectively and as such may affect level of MHL. The exposure of young people to stressors may construct inherent experiences such as negative physical and mental health outcomes that could interfere with their academic performance (Oketch-Oboth & Okunya, 2018). This study suggests that further investigation regarding the management of stress such as relaxing activity and positive thinking technique for enhancement of MHL among young people is needed.

The finding of this present study found an association between media use and MHL among children and young people, which is consistent with previous studies. One qualitative study found a link between Instagram usage and MHL (Riesmeyer et al., 2019). This may be due to greater exposure to media that facilitates children's learning on what (content) and how (technical skills) the information is displayed (Hofferth, 2010). Such an association is consistent with the studies in Denmark and USA that found that frequency of media use was positively associated with social and academic competencies and higher achievement among children and adolescents (Rocheleau, 1995). Media use can reflect abilities and skills in the lives of children (Chinn, 2011). However, a quantitative study from Israel did not find any association between media use and MHL. The finding may be due to social desirability concerns of respondents, which can lead to underreporting of adolescent's reported television viewing with their parents and, thus, skew the study results (Levin-Zamir et al., 2011). Further research is needed to examine the relationship between media use and MHL among children and young people.

This review found support for the effect of parental factors on their child's MHL. Most of the studies indicated that education of parents had a significant impact on MHL of their children (Abel et al., 2014; Levin-Zamir et al., 2011). This may be because parents with higher education are both more health as well as media literate and so they have the ability to discuss content and critical use of media with their child (ren) and planned action or reaction to media content (Levin-Zamir et al., 2011). Some studies also found that children who had parents as their key informant of health-related information were more likely to have higher MHL, particularly among girls (Levin-Zamir et al., 2011; Riesmeyer et al., 2019). That was perhaps because parents were important conduits for knowledge transfer and the exchange of health information among children (Riesmeyer et al., 2019). Girls were more likely to have higher social competence than boys (Nayak, 2014) and to be attached to their primary caregivers (Aveling, 2002). They were more likely to interact with the variety of sources of health information from personal media (Velardo & Drummond, 2019), and these interactions influence the girl's ability to understand or demonstrate her knowledge of a wider variety of uses within the majority of specific health content (Velardo & Drummond, 2019). The findings suggest that an appropriate family-based intervention is important for improving parental knowledge and practices toward improving children's MHL.

This review searched publications in four databases, and followed a rigorous procedure for search terms. The references of included studies were hand-searched which appeared in the inclusion of two additional evidence sources. This review only analyzed articles published in English and Thai. The review probably missed relevant studies published in other languages. The majority of the reviewed literature was cross-sectional studies and, thus, causality cannot be inferred. Longitudinal studies are

essential in providing more information on the direction of the association between individual and environmental factors and MHL. Further research is needed to explore other factors that may influence MHL among children and young people such as language proficiency, technologic experiences (Higgins & Begoray, 2009; Levin-Zamir & Bertschi, 2018; Manganello, 2008), influence of peers (Hamzah, Ismail, & Nor, 2018), health curricula and community (Higgins & Begoray, 2009) that are assumed to influence children's behaviors.

Conclusions and Recommendations

Gender, education, media use, stress, communication skill, and parental factors were found to have consistently positive associations with MHL outcomes. In contrast, an inverse association with MHL was identified for stress level of young people. Findings of the current review highlight the importance of targeting individual's characteristics and their lifestyle behaviors to facilitate early MHL skills and preventing obstacles to learning in children and young people. Creating a supportive family environment via increased MHL knowledge and practices of family members (or caregivers) should be prioritized when designing interventions to improve literacy skills in youth. Furthermore, it is important for policymakers and stakeholders to develop policies and actions taking into account certain socio-demographic and behavioral factors that can help increase effective implementation of improving MHL in target population.

Conflict of Interest

There is no conflict of interest.

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