

# Proposed Standard Framework of Healthy Nutrition Literacy for Preschool Children in Malaysia: A Concept Paper

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## Abstract

Healthy nutrition during early childhood is crucial for children's physical growth, cognitive development, and the formation of lifelong eating behaviours. In Malaysia, child nutrition issues remain complex, as undernutrition, overweight, obesity, and micronutrient deficiencies continue to coexist. Although national references such as the Recommended Nutrient Intakes and the Malaysian Dietary Guidelines provide important guidance, they do not yet offer a developmentally sequenced and pedagogically grounded standard for healthy nutrition literacy among preschool children. This concept paper therefore proposes a Standard Framework of Healthy Nutrition Literacy for preschool children in Malaysia. The paper adopts a qualitative conceptual approach based on document analysis and a focused literature review of peer-reviewed studies, policy documents, curriculum-related materials, and theoretical sources in nutrition literacy, food literacy, child development, and early childhood education. The proposed framework is child-centred and ecologically informed, recognising the role of families, teachers, preschool routines, food environments, and wider community influences. Four interrelated domains are proposed: basic knowledge of healthy food, awareness and attitudes towards healthy eating, basic food choice and decision-making skills, and healthy eating practices in daily life. Overall, the framework provides a foundation for curriculum development, pedagogical planning, and future empirical validation in Malaysia.

**Keywords:** Healthy Nutrition Literacy, Preschool Children, Early Childhood Education, Conceptual Framework, Malaysia

## Introduction

Healthy nutrition during early childhood provides a crucial foundation for physical growth, cognitive development, and the formation of eating behaviours that may persist into later stages of life. Contemporary literature recognises early childhood as a critical developmental period, as dietary patterns and food preferences begin to stabilise during this phase (Aristova et al., 2024). Food literacy has been defined as an interconnected set of knowledge, skills, and behaviours required to plan, manage, select, prepare, and consume food in ways that meet everyday needs (Vidgen & Gallegos, 2014). More recent systematic evidence further

suggests that, although food literacy frameworks hold considerable promise for strengthening the design of nutrition interventions, their application remains inconsistent across existing programmes (Fraser et al., 2026). In the context of preschool children, healthy nutrition literacy should therefore not be understood merely as the acquisition of factual knowledge, but rather as an emerging developmental capacity nurtured through meaningful experiences, daily routines, and guided adult support.

From an educational perspective, preschool institutions represent a highly strategic setting for the development of healthy nutrition literacy, as young children spend a substantial portion of their daily lives within early childhood education environments. Evaluations of nutrition environments in early childhood settings have shown that many nutrition policies remain limited in both scope and strength of implementation language, which may undermine the adoption of best practices related to food provision and eating behaviours (Aristova et al., 2024). In addition, the qualitative study by Carraway-Stage et al. (2014) revealed considerable variation in teachers' understandings of nutrition education, while inadequate professional training and the absence of clearer standards contributed to uneven implementation across classrooms and programmes. More recently, food-based learning has been identified as a promising pedagogical approach because it reduces the tendency for nutrition education to be taught as a stand-alone topic, instead positioning food as an integrated medium for learning across literacy, science, mathematics, and children's everyday experiences (Stage et al., 2025). Evidence on preschool teachers' needs further indicates that the frequency with which food-based learning is implemented is closely associated with the availability of resources, perceived barriers, and the priority teachers assign to nutrition education (Resor et al., 2024). Accordingly, the development of a healthy nutrition literacy standard cannot be separated from the pedagogical realities of preschool practice, the quality of teacher preparation, and the clarity of implementation standards within early childhood education settings.

At the policy level, Malaysia already possesses several important nutrition reference documents, particularly the Recommended Nutrient Intakes (RNI) 2017 and the Malaysian Dietary Guidelines 2020, both of which function as key resources for planning, assessment, and the promotion of healthy dietary practices at the population level (National Coordinating Committee on Food and Nutrition, 2017). National dietary guidance documents also provide core messages related to healthy and balanced daily eating patterns (National Coordinating Committee on Food and Nutrition, 2021). However, these documents are primarily oriented towards nutrient recommendations, dietary patterns, and broad public health messages, rather than a developmentally structured nutrition literacy standard specifically designed for preschool children. At the same time, recent local research has succeeded in developing a nutritional education model for malnourished preschool children that incorporates home, school, and community components, demonstrating that efforts to build contextually grounded models in Malaysia are already emerging (Rani et al., 2025). Nevertheless, such initiatives remain intervention-specific and have yet to evolve into a national literacy standard capable of guiding curriculum design, pedagogy, and developmental assessment in a more systematic and consistent manner. This gap between existing national nutrition guidance and the need for a preschool-specific healthy nutrition literacy standard provides a strong justification for proposing a framework that is contextualised, developmentally appropriate, and responsive to the Malaysian setting.

### Problem Statement

Nutrition-related problems among children in Malaysia are longstanding, yet their current manifestation is increasingly complex and multidimensional. Early evidence showed that Malaysia was already experiencing a double burden of malnutrition, marked by the coexistence of undernutrition and a growing prevalence of overweight among children, particularly in low-income and urban populations (Khor, 2005). Subsequent findings from SEANUTS Malaysia reinforced this concern by demonstrating that the prevalence of overweight and obesity exceeded that of thinness and stunting, while micronutrient deficiencies, particularly vitamin D deficiency, remained highly prevalent among Malaysian children (Poh et al., 2013). More recent data from SEANUTS II Malaysia further confirmed the persistence of a triple burden of malnutrition, encompassing undernutrition, overnutrition, and micronutrient deficiencies, alongside national trend data indicating increases in underweight, stunting, and obesity among children under five between 2011 and 2019 (Poh et al., 2023). These patterns suggest that child nutrition in Malaysia should no longer be viewed as a narrow dietary concern, but rather as a major developmental and public health issue requiring coordinated and sustained intervention from the earliest years of life.

The urgency of this issue is particularly evident in the preschool period, during which food preferences, eating routines, and habitual responses to food begin to take shape in more enduring ways. Recent evidence indicates that Malaysian preschool children exhibit diverse dietary patterns, including healthy eating, Western food consumption, high salt and sugar intake, and sugary drink consumption, reflecting uneven adoption of healthy eating practices at an early age (Hasmuni Chew et al., 2024). Importantly, these dietary patterns were found to be associated with a range of sociodemographic factors, including ethnicity, parental characteristics, household income, and family size, suggesting that children's nutritional experiences are deeply embedded within broader family and social contexts (Hasmuni Chew et al., 2024). In parallel, Mohd Nasir et al. (2012) reported significant associations between feeding practices, eating habits, anthropometric indicators, and preschoolers' cognitive performance, highlighting the close interrelationship between nutrition, learning, and development. Taken together, these findings indicate that nutrition in the preschool years must be addressed not solely through clinical or biomedical lenses, but also through educational and developmental frameworks.

Although Malaysia has established important policy references, including the Recommended Nutrient Intakes (RNI) 2017 and the Malaysian Dietary Guidelines 2020, these documents primarily function as broad national guidance on nutrient requirements and healthy dietary practices for the general population (National Coordinating Committee on Food and Nutrition, 2017, 2021). They offer valuable nutritional direction, yet they do not constitute a developmentally sequenced or pedagogically grounded healthy nutrition literacy standard for preschool children. This distinction is important because the existence of dietary guidelines does not automatically translate into age-appropriate literacy outcomes, classroom practice, or developmental assessment criteria for young children. As such, while Malaysia possesses nutritional guidance at the policy level, a significant conceptual and implementation gap remains between population-level recommendations and the educational realities of preschool nutrition learning.

This gap is further reflected at the level of practice, where nutrition education in early childhood settings often depends heavily on individual teacher interpretation rather than on a common standard or structured pedagogical framework. Carraway-Stage et al. (2014) found that preschool teachers and administrators understood nutrition education in markedly different ways, ranging from simple exposure to healthy foods to the provision of healthy meals, reflecting substantial inconsistency in both conceptualisation and implementation. The same study also reported variation in the frequency and content of nutrition education, while underscoring the need for clearer curricular guidance and stronger professional preparation for teachers (Carraway-Stage et al., 2014). Other studies similarly indicate that early childhood educators frequently encounter limitations related to training, confidence, time, resources, and institutional support, despite recognising their important role in influencing children's eating behaviours (Rapson, Conlon, & Ali, 2020; Resor et al., 2024). In the absence of clearly defined domains, indicators, and implementation expectations, preschool nutrition education is likely to remain fragmented, uneven, and overly reliant on localised or individual initiatives.

In the Malaysian context, some efforts towards more structured nutrition education are beginning to emerge. For example, (Rani et al., 2025) developed a nutrition education model for preschool children experiencing malnutrition, incorporating home, school, and community components. While this represents an important local contribution, the model remains intervention-specific and targeted to a particular risk group, rather than functioning as a universal national standard for preschool healthy nutrition literacy. Moreover, the broader literature suggests that effective early nutrition education should be embedded within everyday pedagogy, teacher preparation, and food-based learning experiences, rather than delivered as isolated or supplementary content (Resor et al., 2024; Stage et al., 2025). Therefore, the central issue in Malaysia is not merely the availability of nutrition information, but the absence of a coherent, developmentally appropriate, and contextually relevant standard framework that can guide curriculum design, pedagogical practice, and assessment in preschool settings. This gap provides a strong justification for proposing a Standard Framework of Healthy Nutrition Literacy for Preschool Children in Malaysia.

### *Research Objectives*

The primary objective of this concept paper is to propose a standard framework for healthy nutrition literacy among preschool children in Malaysia. This paper aims to:

1. Examine the need for developing a standard framework of healthy nutrition literacy for preschool children in the Malaysian context.
2. Identify the key domains and components that are appropriate for inclusion in the proposed healthy nutrition literacy framework for preschool children.

### *Research Questions*

1. What is the need for developing a standard framework of healthy nutrition literacy for preschool children in Malaysia?
2. What are the key domains and components that should be included in the proposed healthy nutrition literacy framework for preschool children?

*Concept of a Standard Framework for Healthy Nutrition Literacy among Preschool Children in Malaysia*

Nevertheless, the framework should be understood as a conceptual starting point rather than a finalised national standard. Future work should refine these domains into measurable developmental indicators, validate them through expert consensus and empirical inquiry, and examine their suitability across diverse preschool contexts in Malaysia. Overall, this article provides an important foundation for positioning healthy nutrition literacy as a meaningful component of early childhood education and long-term child well-being.

The proposed framework is organised around a child-centred and ecologically supported structure. At its centre is the preschool child, whose healthy nutrition literacy develops not in isolation, but through continuous interaction with family members, teachers, preschool routines, food environments, and community influences. This proposition is theoretically aligned with Bronfenbrenner's ecological perspective, which highlights the influence of interconnected systems on child development, and with Bandura's social cognitive perspective, which explains how children learn through observation, imitation, reinforcement, and repeated social experience (Schunk, 2012). It is further supported by literature showing that nutrition education in early childhood settings is shaped by teacher preparedness, classroom practice, the strength of institutional support, and the broader home-school relationship (Aristova et al., 2024; Carraway-Stage et al., 2014; Rani et al., 2025). Accordingly, the framework should not be understood merely as a list of nutrition topics, but as a developmental guide for curriculum, pedagogy, routine formation, and early assessment.

Within this structure, healthy nutrition literacy among preschool children in Malaysia may be organised into four interrelated domains: (1) basic knowledge and understanding of healthy food, (2) awareness, attitudes, and interest towards healthy eating, (3) basic food choice and decision-making skills, and (4) healthy eating practices and routines in daily life. Consistent with the broader food literacy perspectives advanced by Vidgen and Gallegos (2014) as well as Cullen, Hatch, Martin, Higgins, & Sheppard (2015), these domains should be understood as interdependent rather than strictly linear. Early knowledge supports awareness, while awareness and interest shape children's willingness to make healthier choices. Over time, repeated choices that are reinforced through everyday routines may gradually develop into stable practices. In this way, the proposed framework moves beyond cognitive learning alone and positions healthy nutrition literacy as a combination of what children know, how they respond, what they choose, and what they repeatedly do in everyday life. This adaptation therefore preserves the broader orientation of food literacy frameworks while making them more developmentally appropriate for preschool children and more relevant to the Malaysian educational context.

**Domain 1: Basic Knowledge and Understanding of Healthy Food**

The first domain refers to children's emerging understanding of healthy food and eating at a simple, concrete, and meaningful level. At the preschool stage, this domain should emphasise basic understandings such as recognising common healthy foods, identifying simplified food groups, understanding the importance of drinking plain water, and knowing that fruits, vegetables, and balanced meals support growth and active living. As noted by Carraway-Stage et al. (2014) and Stage et al. (2025), effective nutrition education in early childhood should

begin with familiar and experience-based concepts rather than technical nutrition content. Therefore, this domain provides the essential cognitive foundation for the development of healthy nutrition literacy during the preschool years.

Developmental indicators within this domain may include the ability to name familiar healthy foods, distinguish healthier everyday foods from less healthy options in simple situations, recognise the role of water in daily life, and respond to basic teacher prompts about healthy eating. In line with Carraway-Stage et al. (2014), learning at this stage should take place through pictures, stories, songs, food sorting, classroom conversations, sensory activities, and guided real-life experiences rather than formal instruction alone. Such experiences help children connect food knowledge with everyday life in meaningful ways. In conclusion, this domain supports the gradual development of later attitudes, choices, and healthy eating practices.

#### Domain 2: Awareness, Attitudes, and Interest towards Healthy Eating

The second domain refers to children's early awareness, attitudes, and interest towards healthy eating. At the preschool level, healthy nutrition literacy should not be limited to recognising healthy foods, but should also include children's curiosity, willingness to try nutritious foods, and positive responses towards healthy eating experiences. As discussed by Aristova et al. (2024) and Hasmuni Chew et al. (2024), early childhood is an important period for shaping food acceptance, preferences, and emotional responses towards food. Therefore, this domain highlights the importance of fostering positive dispositions towards healthy eating from an early age.

Developmental indicators within this domain may include showing interest when healthy foods are introduced, participating willingly in food-related activities, expressing enjoyment during healthy eating routines, and demonstrating openness to tasting nutritious foods with encouragement. In line with Bandura's (1986) emphasis on modelling and social learning, as well as Carraway-Stage et al. (2014), these attitudes are best nurtured through enjoyable, repeated, and non-coercive experiences guided by teachers and parents (Schunk, 2012). Such positive exposure helps children develop familiarity and confidence in relation to healthy foods. In conclusion, this domain supports the affective foundation needed for children to engage positively with healthy eating.

#### Domain 3: Basic Food Choice and Decision-Making Skills

The third domain refers to children's emerging ability to make simple and healthier food-related choices in age-appropriate situations. At the preschool stage, decision-making should be understood as guided and supported rather than fully independent, as children are still developing the ability to connect knowledge with action. As emphasised by Vidgen and Gallegos (2014) and Cullen et al. (2015), food literacy involves not only understanding but also the ability to respond and act meaningfully in everyday food environments. Therefore, this domain introduces healthy nutrition literacy as an early capacity for guided food-related judgment.

Developmental indicators within this domain may include choosing plain water over sweetened drinks, selecting fruit or simple nutritious snacks when options are given, recognising that some foods are suitable for everyday consumption, and responding

appropriately to basic food-related scenarios. In line with Hasmuni Chew et al. (2024), these choices are shaped not only by children's understanding, but also by the food environments and social influences surrounding them. For this reason, choice-making at this stage should be nurtured through repetition, adult guidance, and supportive routines. In conclusion, this domain helps translate children's early knowledge and attitudes into simple, healthier food-related decisions.

#### Domain 4: Healthy Eating Practices and Routines in Daily Life

The fourth domain refers to the observable practice of healthy eating through daily routines, habits, and simple food-related behaviours. In preschool, healthy nutrition literacy should be reflected not only in what children know or prefer, but also in what they repeatedly do during meals, snacks, and other food-related situations. Bronfenbrenner (1979) and Bandura (1986) both suggest that children's behaviours develop through repeated participation in social environments and everyday routines shaped by adults and institutions (Schunk, 2012). Therefore, this domain positions healthy eating practices as the behavioural expression of early nutrition literacy.

Developmental indicators within this domain may include washing hands before meals, following regular eating routines, sitting appropriately during mealtimes, participating in simple food preparation activities, and demonstrating repeated healthy eating behaviours in preschool settings. As noted by Resor et al. (2024) and Stage et al. (2025), meaningful nutrition education in early childhood is most effective when it is embedded in daily practice rather than taught only as isolated content. Through such repeated routines, children gradually internalise healthy behaviours as part of normal daily life. In conclusion, this domain ensures that healthy nutrition literacy is expressed through consistent and developmentally appropriate practice.

In summary, the proposed Standard Framework of Healthy Nutrition Literacy among Preschool Children in Malaysia positions healthy nutrition literacy as a developmentally sequenced, ecologically supported, and practically oriented construct. The four proposed domains collectively reflect what preschool children should begin to know, feel, choose, and practise in relation to healthy eating. By linking these domains with the roles of home, preschool, and community, the framework offers a stronger conceptual foundation for curriculum planning, pedagogical practice, early assessment, and future empirical validation in the Malaysian context.

#### **Significance of the Study**

This study is significant because it addresses a conceptual gap in the field of healthy nutrition literacy among preschool children in Malaysia. Although child nutrition has long been discussed in the Malaysian context, existing evidence continues to indicate the coexistence of undernutrition, overweight and obesity, as well as micronutrient deficiencies among Malaysian children (Khor, 2005; Poh et al., 2013, 2023). Early childhood is also widely recognised as a critical period for the formation of eating habits and food preferences that may influence health outcomes later in life (Aristova et al., 2024). Against this background, the present study is important because it proposes a standard framework that may provide a scholarly basis for strengthening healthy nutrition knowledge, attitudes, and practices among preschool children. The proposed framework may further assist teachers and

preschool institutions in delivering nutrition education in a more systematic, coherent, and developmentally appropriate manner.

In addition, this study is significant for policymakers, parents, communities, and researchers, as children's healthy nutrition literacy is shaped through the interaction between home, school, and the broader social environment. This is consistent with the view that effective preschool nutrition education should involve comprehensive integration across school, family, and community contexts (Rani et al., 2025). Therefore, the proposed framework may serve as a reference point for the development of curriculum, pedagogy, early interventions, and assessment practices that are better aligned with the Malaysian context. At the same time, the study also creates opportunities for further research in the form of instrument development, module design, developmental indicators, and intervention studies related to healthy nutrition literacy among preschool children. Overall, this study is important because it contributes towards the development of a more structured, contextualised, and relevant standard foundation for strengthening healthy nutrition education in Malaysia.

### **Literature Review**

A review of the literature suggests that healthy nutrition literacy can no longer be understood merely as knowledge of nutritious foods but should instead be viewed as a broader capacity to plan, select, prepare, and practise eating in ways that support health. Vidgen and Gallegos (2014) conceptualised food literacy through four main domains, namely plan and manage, select, prepare, and eat, thereby highlighting the interrelationship between knowledge, skills, and food-related behaviours. In the context of family-based interventions, Fraser et al. (2026) showed that many nutrition programmes for parents and young children address these domains, even though not all of them are explicitly developed on the basis of a clearly defined food literacy framework. Ahmadi & Karamitanha (2023) further argued that maternal health literacy and nutrition literacy are closely associated with mothers' capacity to make better food decisions for their preschool children. Taken together, these studies suggest that healthy nutrition literacy among preschool children should be defined as a developmentally appropriate construct, grounded in everyday practices and supported by significant adults.

In the Malaysian context, the literature consistently shows that children continue to face complex and layered forms of malnutrition. Khor (2005) had earlier explained that Malaysia was experiencing a dual burden of malnutrition, referring to the coexistence of undernutrition and a growing prevalence of excess weight among children. Findings from SEANUTS Malaysia further indicated that the prevalence of overweight (9.8%) and obesity (11.8%) exceeded that of thinness (5.4%) and stunting (8.4%), while nearly half of the children studied were reported to have vitamin D deficiency (Poh et al., 2013). This pattern was reinforced by SEANUTS II Malaysia, which reported the continued coexistence of stunting, thinness, overweight, and obesity, while anaemia among young children, as well as inadequate calcium and vitamin D intake, remained important concerns (Poh et al., 2023). At the regional level, Tan et al. (2025) similarly emphasised that the triple burden of malnutrition among Southeast Asian children is shaped by interrelated individual, family, and socioecological factors. The Malaysian and regional literature clearly demonstrates that childhood nutrition problems are no longer singular in nature but instead require a more comprehensive and contextualised standard framework.

The literature also indicates that preschool institutions represent a strategic setting for the development of healthy nutrition literacy, although implementation continues to face multiple constraints. Carraway-Stage et al. (2014) found that nutrition education in preschool classrooms was often influenced by limited teacher training, financial constraints, and policies and regulations that were insufficiently supportive of high-quality implementation. Aristova et al. (2024) likewise reported that many nutrition policies in early childhood education settings remain weak in terms of both content breadth and policy language strength, thereby undermining the implementation of best practices. From a pedagogical perspective, Stage et al. (2025) showed that preschool teachers are better able to implement nutrition education when they receive structured professional training and when nutrition content is integrated with other learning domains such as science and language. These findings support the view that early nutrition education should not be taught in isolation but rather should be built through meaningful daily experiences that are appropriate to children's developmental level.

In addition, the literature underscores that the development of healthy eating practices among preschool children is strongly influenced by family dynamics, caregiving patterns, and sociodemographic background. Mohd Nasir et al. (2012) demonstrated that feeding practices, eating habits, and the anthropometric status of preschool children in Peninsular Malaysia were associated with developmental outcomes such as cognitive performance. Saipudin, Suhairom, Husna, & Wahid (2022) further found that health was the primary motive underlying food choices among parents of preschool children in Selangor, indicating that family food decisions have direct implications for children's well-being. At the same time, Hasmuni Chew et al. (2024) showed that dietary patterns among Malaysian preschool children varied according to ethnicity, age, place of residence, parental weight status, and household income. Although Rani et al. (2025) developed a nutrition education model for malnourished preschool children in Malaysia that incorporated home, school, and community components, the model has not yet functioned as a comprehensive healthy nutrition literacy standard for all preschool children. The existing literature therefore points to a clear need for the development of a standard framework of healthy nutrition literacy that systematically connects the child, family, school, and the Malaysian context.

### **Methodology**

This concept paper adopted a qualitative conceptual approach grounded in document analysis and a focused literature review to develop a proposed Standard Framework of Healthy Nutrition Literacy for preschool children in Malaysia. In research writing, methodology refers to the broader orientation of the study, whereas methods refer to the specific techniques used to collect, organise, analyse, and interpret information (Neuman, 2014). In line with this distinction, the present paper was guided by a qualitative methodological orientation, while document analysis functioned as the main method for examining relevant scholarly, theoretical, and policy-related sources. This approach is also consistent with Creswell & Creswell (2018) view that a research approach should clearly connect assumptions, design, and methods in a coherent manner.

The documents reviewed included peer-reviewed journal articles, curriculum-related materials, policy documents, and selected theoretical sources relevant to nutrition literacy, food literacy, early childhood education, and child development. The analysis focused on

identifying recurring concepts, theoretical foundations, contextual issues, and developmentally appropriate domains relevant to children aged four to six years. The documents were read repeatedly, compared across sources, and synthesised into a preliminary set of domains and supporting components for the proposed framework. Such a procedure is consistent with document analysis practices that emphasise systematic review, repeated reading, categorization, and thematic interpretation to derive meaning from texts and construct analytically grounded findings (Billing, Bjørgen, Melis, & Wold, 2025; Creswell & Creswell, 2018). Overall, this methodology enabled the paper to transform dispersed literature into a coherent conceptual framework that is theoretically informed and contextually relevant to the Malaysian preschool setting.

### **Implications of the Study**

The proposed Standard Framework of Healthy Nutrition Literacy for preschool children in Malaysia carries important implications for early childhood education, curriculum development, and health promotion. At the educational level, the framework may serve as a structured reference for preschool teachers in planning developmentally appropriate learning experiences related to healthy eating, food choices, and daily nutrition practices. It may also support the integration of nutrition-related content into preschool pedagogy in a more systematic and meaningful manner, rather than treating it as an isolated or incidental topic. In addition, the framework has the potential to inform curriculum developers and relevant educational authorities in strengthening the position of healthy nutrition literacy within early childhood education in Malaysia.

The study also carries implications for parents, policymakers, and future research. For parents and caregivers, the proposed framework may provide a clearer understanding of the foundational nutrition-related knowledge, attitudes, and practices that should be nurtured during early childhood. For policymakers and relevant agencies, it may contribute to the development of more coherent guidelines, interventions, and cross-sectoral initiatives involving homes, preschools, and communities. From a research perspective, the framework may serve as a conceptual basis for future studies, particularly in the development of assessment instruments, intervention modules, and empirical validation of the proposed domains and components. Collectively, these implications highlight the relevance of the proposed framework as a foundation for strengthening healthy nutrition literacy among preschool children in the Malaysian context.

### **Discussion and Conclusion**

The present concept paper argues that the development of a Standard Framework of Healthy Nutrition Literacy for preschool children in Malaysia is both timely and necessary. This argument is strongly supported by evidence showing that Malaysian children continue to experience multiple and overlapping forms of malnutrition, including undernutrition, overweight, obesity, and micronutrient deficiencies, reflecting a persistent dual and triple burden of malnutrition (Khor, 2005; Poh et al., 2013, 2023). These concerns are especially critical during early childhood, as this developmental period plays an important role in shaping food preferences, eating habits, and health-related behaviours that may continue into later life (Aristova et al., 2024). Within this context, preschool education offers a strategic setting for cultivating children's early understanding of healthy food, fostering positive attitudes towards healthy eating, and embedding beneficial routines through everyday

learning experiences. However, existing literature also shows that nutrition education in preschool settings often remains inconsistent due to limited teacher preparation, inadequate pedagogical resources, and weak implementation support (Aristova et al., 2024; Carraway-Stage et al., 2014; Resor et al., 2024). Therefore, the proposed framework responds to an important conceptual and educational gap by positioning healthy nutrition literacy as a structured developmental construct rather than merely a general health aspiration.

The discussion further suggests that healthy nutrition literacy for preschool children should not be interpreted as a simplified version of adult food literacy alone. Rather, it should be conceptualised as an age-appropriate, context-sensitive, and ecologically supported capacity that develops through the interaction of children with parents, teachers, institutions, and the wider food environment. This position is consistent with food literacy scholarship which emphasises that literacy involves not only knowledge, but also decision-making, behaviour, and meaningful action in real food environments (Vidgen & Gallegos, 2014; Cullen et al., 2015). It is also aligned with the theoretical perspectives discussed earlier, particularly ecological, social cognitive, and experiential learning approaches, all of which highlight that young children learn through observation, repetition, modelling, and direct engagement with meaningful experiences (Carraway-Stage et al., 2014). In the Malaysian context, such a framework must also remain sensitive to local nutritional challenges, sociocultural diversity, and the influence of family and community factors on children's dietary experiences (Hasmini Chew et al., 2024; Rani et al., 2025). Accordingly, the proposed framework shifts the discussion from broad dietary guidance towards a more structured educational orientation that can inform curriculum design, pedagogical planning, and early intervention.

In conclusion, this concept paper has established several major findings. First, the development of a Standard Framework of Healthy Nutrition Literacy for preschool children in Malaysia is necessary due to the absence of a developmentally sequenced and pedagogically grounded standard that specifically addresses healthy nutrition literacy at the preschool level. Second, healthy nutrition literacy among preschool children should be conceptualized as a child centered and ecologically supported construct that should be shaped by children's interactions with families, teachers, preschool routines, food environments and wider community influences. Third, the proposed framework identifies four interrelated domains: (1) basic knowledge and understanding of healthy food, (2) awareness, attitudes and interest towards healthy eating, (3) basic food choice and decision-making skills, and (4) healthy eating practices and routines in daily life. These findings suggest that healthy nutrition literacy in early childhood should extend beyond factual knowledge about food to encompass children developing awareness, attitudes, decision-making abilities, and everyday eating practices and routines.

Based in these major findings, several suggestions are proposed. Future research should refine the proposed domains into specific developmental indicators and measurable learning outcomes that are appropriate for preschool children aged four to six years old. The framework should also be validated through expert evaluation involving specialists in early education, paediatric nutrition, curriculum development, preschool pedagogy and child health. In addition, empirical studies should be conducted across diverse Malaysian preschool contexts to examine the frameworks practicality, cultural relevance and applicability in classroom and home school settings. The proposed framework may further serve as a

foundation for developing teacher training modules, classroom-based nutrition activities, assessment instruments and family supported nutrition literacy interventions. Overall, this concept paper provides a foundational contribution towards strengthening healthy nutrition literacy as an integral component of early childhood education, curriculum planning and child well-being in Malaysia.

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