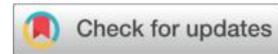


# Parental Health Literacy and Its Role in Shaping Children's Health Behaviors



**Dr. Soumia Harbouche<sup>1</sup>**

<sup>1</sup>University of University of Mohamed Lamine Debbeghine Setif 2, Algeria, Email:  
[psy\\_harbouche@yahoo.fr](mailto:psy_harbouche@yahoo.fr) / <http://orcid.org/0009-0008-6596-1909>

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## **Abstract:**

Parental health literacy is a pivotal determinant of children's health behaviors amid global epidemiological shifts, rising childhood obesity, sedentary lifestyles, and increased digital exposure. This integrative theoretical–empirical review examines how functional, interactive, and critical health literacy among parents influences children's preventive, nutritional, physical, and psychosocial health practices. Drawing on empirical studies (2015–2025), cross-cultural research, and reports from WHO and UNICEF, the analysis demonstrates that parental health literacy extends beyond knowledge acquisition to a multidimensional capacity shaping decision-making, modeling, healthcare navigation, and lifestyle organization. Findings indicate that critical health literacy most strongly predicts sustained healthy behaviors, whereas functional literacy primarily affects adherence to basic preventive measures. Policy and intervention recommendations emphasize strengthening family-centered health promotion strategies.

**Keywords:** parental health literacy; child health behaviors; preventive health; cross-cultural comparison; Arab and Western societies

## **1. Introduction**

Child health in the twenty-first century is increasingly shaped by behavioral and lifestyle determinants rather than exclusively by infectious or acute medical conditions (World Health Organization [WHO], 2021). Global epidemiological transitions have shifted the burden of disease toward non-communicable conditions that begin early in life and persist into adulthood (Roth et al., 2020). According to WHO, more than 340 million children and adolescents aged 5–19 were classified as overweight or obese in recent global estimates, reflecting a tenfold increase over the past four decades (WHO, 2021). Moreover, insufficient physical activity affects approximately 81% of adolescents worldwide, with girls demonstrating consistently lower activity levels than boys (WHO, 2020). These trends are accompanied by rising rates of childhood hypertension, type 2 diabetes, sleep disorders, and psychosocial distress (Ng et al., 2014).

Parallel to metabolic and physical health concerns, behavioral risks linked to digitalization have become increasingly salient. Reports from UNICEF indicate that children are accessing digital devices at progressively younger ages, often exceeding recommended daily screen-time limits (UNICEF, 2017). Excessive screen exposure has been associated with sedentary patterns, impaired sleep regulation, and decreased parent–child interaction quality (Twenge & Campbell, 2018).

Thus, contemporary child health must be understood within a complex matrix of nutritional transitions, technological immersion, and evolving family dynamics (Popkin, 2017).

While structural determinants such as urban design, food marketing, socioeconomic inequality, and education systems undeniably influence child health outcomes, the family remains the primary micro-environment of behavioral modeling and regulation (Bronfenbrenner, 1979; Patrick et al., 2005). Within this micro-system, parents function as nutritional gatekeepers, mediators of healthcare access, interpreters of medical information, regulators of daily routines, and constructors of health norms. However, parental influence is not merely a matter of authority or intention; it is deeply contingent upon parents' capacity to understand, evaluate, and apply health information appropriately. This capacity is conceptualized in contemporary public health scholarship as health literacy (Nutbeam, 2000; WHO, 2013).

Health literacy has undergone substantial conceptual expansion since its early definitions focused primarily on reading and numeracy skills in clinical settings. WHO defines health literacy as encompassing the cognitive and social skills that determine individuals' motivation and ability to gain access to, understand, and use information in ways that promote and maintain good health (WHO, 2013). Nutbeam's tripartite model further distinguishes between functional, interactive, and critical health literacy, thereby framing health literacy as both an individual competency and a social empowerment mechanism (Nutbeam, 2000). Functional health literacy refers to basic reading and comprehension abilities necessary for following medical instructions. Interactive health literacy involves advanced communicative and social skills that enable active participation in healthcare decision-making. Critical health literacy extends to the ability to critically analyze information, question commercial influences, and make autonomous, contextually appropriate health choices (Nutbeam, 2000; Sørensen et al., 2012).

When applied to parenting, these dimensions acquire amplified significance. Parents with higher functional health literacy are more likely to comply with vaccination schedules, medication dosing, and preventive check-ups (DeWalt et al., 2004). Those with interactive literacy tend to communicate effectively with pediatric healthcare providers and seek clarification when needed (Schillinger et al., 2002). Parents demonstrating critical health literacy are better equipped to evaluate food labeling, question misleading marketing of ultra-processed foods, regulate digital consumption, and adopt preventive lifestyle strategies despite social pressures (Kickbusch et al., 2013).

Empirical research consistently demonstrates associations between parental health literacy and children's health outcomes. Studies conducted in North America and Europe reveal that low parental health literacy correlates with higher rates of emergency department utilization, lower vaccination adherence, and increased childhood obesity prevalence (DeWalt et al., 2004; Sanders et al., 2009). Conversely, parents with higher health literacy levels demonstrate improved dietary structuring, more consistent physical activity encouragement, and more effective sleep routine establishment (Morrison et al., 2019). However, these findings cannot be universally generalized without cultural contextualization.

In Western societies, institutionalized preventive healthcare systems, school-based health education programs, and widespread digital health information access contribute to relatively higher average levels of parental health literacy (Sørensen et al., 2015). Nonetheless, even within

these contexts, disparities persist along socioeconomic and migrant-status lines (Magnani et al., 2005). In contrast, Arab societies present a more heterogeneous landscape. Rapid urbanization, nutrition transition toward energy-dense Westernized diets, and digital expansion coexist with traditional health beliefs, extended family caregiving structures, and uneven access to structured health education programs (Nasreddine et al., 2018; Musaiger, 2011). Reports from WHO indicate rising childhood overweight prevalence across Middle Eastern and North African countries, with some Gulf states reporting rates comparable to or exceeding Western averages (WHO, 2021). At the same time, gaps remain in preventive screening practices and consistent physical activity promotion, particularly among girls in certain sociocultural settings (El Mouzan et al., 2010).

The critical question, therefore, is not whether parental health literacy matters, but rather how and to what extent its different dimensions selectively influence specific categories of child health behaviors across cultural contexts. Addressing these questions requires moving beyond fragmented empirical observations toward an integrative theoretical–empirical framework capable of synthesizing global data with sociocultural analysis. This article therefore seeks to bridge conceptual models of health literacy with comparative empirical findings from Arab and Western societies, in order to identify the mechanisms through which parental health literacy determines the manifestation of children’s health behaviors.

By integrating global statistical evidence, cross-cultural research, and theoretical models of behavioral transmission, this study aims to contribute to international scholarship in public health, developmental psychology, and family studies, while offering policy-relevant insights for culturally adapted health promotion strategies (Nutbeam, 2000; WHO, 2013; UNICEF, 2017).

## **2. Research Problem, Objectives, and Research Questions**

### **2.1 Research Problem**

Despite unprecedented global investments in child health promotion, disparities in children’s health behaviors persist across and within societies. Epidemiological data from the World Health Organization (2023) indicate that non-communicable diseases (NCDs) account for approximately 74% of global deaths, with behavioral risk factors—many established during childhood—serving as foundational contributors. Early-life determinants such as poor nutrition, insufficient physical activity, irregular sleep hygiene, suboptimal vaccination adherence, and excessive screen exposure significantly increase long-term cardiometabolic and psychosocial vulnerability (WHO, 2023).

At the same time, reports by UNICEF (2022) reveal marked inequalities in children’s access to preventive care, balanced nutrition, and safe recreational environments, particularly across low- and middle-income regions. Even within high-income Western societies, socioeconomic gradients in childhood obesity and preventive healthcare utilization remain pronounced (OECD, 2021). These patterns suggest that structural determinants alone do not fully account for behavioral variability; rather, family-level mediators play a critical role.

Within this family-level dynamic, parental health literacy has been increasingly identified as a proximal determinant of child health outcomes. Empirical studies have demonstrated that limited parental health literacy is associated with higher emergency department use, medication misinterpretation, and lower adherence to preventive guidelines (Sanders et al., 2009; Morrison

et al., 2018). More recent analyses have expanded this association to lifestyle domains, including dietary regulation and physical activity encouragement (Yin et al., 2017; DeWalt & Hink, 2009). However, these studies often examine isolated behaviors rather than providing an integrative understanding of how different dimensions of health literacy selectively influence distinct behavioral categories.

Furthermore, cross-cultural comparisons remain underdeveloped. Western literature tends to assume institutionalized preventive frameworks and widespread access to digital health information, whereas research in Arab contexts highlights the influence of traditional knowledge systems, family collectivism, and uneven public health infrastructure (Al-Yateem et al., 2020). The World Health Organization Eastern Mediterranean Regional Office (EMRO) reports increasing childhood overweight prevalence exceeding 20% in several Middle Eastern countries, coupled with insufficient physical activity rates surpassing global averages among adolescents (WHO EMRO, 2022). Yet, systematic synthesis comparing these patterns with Western contexts remains limited.

Another conceptual gap lies in the multidimensional nature of health literacy itself. Nutbeam (2000) distinguishes functional, interactive, and critical health literacy; nevertheless, many empirical studies measure only functional literacy through reading comprehension or numeracy scales. Consequently, the differential predictive power of interactive and critical literacy on lifestyle regulation remains insufficiently theorized. For example, while functional literacy may ensure correct vaccine scheduling, critical literacy may determine parents' capacity to resist aggressive marketing of ultra-processed foods or to evaluate contradictory online information regarding child nutrition.

The research problem addressed in this article can therefore be formulated as follows:

**There is insufficient integrative and comparative understanding of how different dimensions of parental health literacy determine the selective adoption of specific health behaviors among children across Arab and Western sociocultural contexts.**

Addressing this gap requires synthesizing theoretical models of behavioral transmission with empirical findings and global statistical evidence.

## **2.2 Research Objectives**

This study pursues four interrelated objectives:

First, to conceptually clarify the multidimensional construct of parental health literacy by integrating contemporary public health frameworks and educational psychology models (Nutbeam, 2000; Sørensen et al., 2012).

Second, to examine empirically documented associations between parental health literacy and children's health behaviors, including preventive healthcare adherence, nutrition patterns, physical activity, sleep hygiene, hygiene practices, and digital exposure management (Yin et al., 2017; Morrison et al., 2018).

Third, to conduct a comparative analysis of Arab and Western contexts by synthesizing findings from peer-reviewed studies and statistical reports issued by the World Health Organization, UNICEF, and the Organisation for Economic Co-operation and Development.

Fourth, to identify which dimension of parental health literacy (functional, interactive, or critical) most strongly predicts specific categories of child health behaviors within distinct sociocultural settings.

### **2.3 Research Questions**

Grounded in the preceding analysis, this study addresses the following research questions:

1. How is parental health literacy conceptually defined and operationalized in contemporary public health and behavioral research?
2. What empirical evidence supports the relationship between parental health literacy and children's preventive, nutritional, physical, and digital health behaviors?
3. What similarities and differences characterize the manifestation of this relationship across Western and Arab societies?
4. Which dimension of parental health literacy demonstrates the strongest predictive association with sustained healthy lifestyle behaviors among children?

### **2.4 Working Hypotheses (Theoretical–Empirical Orientation)**

Based on existing literature and epidemiological patterns, the following working hypotheses guide the integrative analysis:

- **H1:** Functional parental health literacy primarily predicts adherence to structured preventive healthcare behaviors such as vaccination compliance and medication accuracy (Sanders et al., 2009).
- **H2:** Interactive health literacy significantly influences healthcare navigation, communication with pediatric professionals, and follow-up consistency.
- **H3:** Critical health literacy is the strongest determinant of lifestyle-related behaviors, including dietary quality, physical activity structuring, and screen-time regulation.
- **H4:** Sociocultural context moderates the relationship between parental health literacy and children's health behaviors, producing distinct manifestation patterns in Arab and Western societies.

## **3. Conceptual and Theoretical Framework**

### **3.1 The Evolution and Multidimensional Nature of Health Literacy**

The concept of health literacy has undergone significant epistemological transformation over the past three decades. Initially conceptualized within clinical settings as a functional skill limited to reading prescriptions and understanding medical instructions, health literacy has progressively evolved into a multidimensional construct integrating cognitive, social, communicative, and critical capacities (Nutbeam, 2000; Sørensen et al., 2012).

The World Health Organization defines health literacy as the cognitive and social skills determining individuals' motivation and ability to access, understand, appraise, and apply health information to make informed health decisions (WHO, 2013). This definition expands the

construct beyond mere comprehension toward decision-making competence and behavioral implementation.

Nutbeam's (2000) seminal model distinguishes three hierarchical dimensions:

1. **Functional health literacy** – basic reading and writing skills necessary to function effectively in everyday health situations.
2. **Interactive health literacy** – advanced cognitive and social skills enabling active participation in healthcare contexts.
3. **Critical health literacy** – the ability to critically analyze information and exert greater control over life events and health determinants.

Sørensen et al. (2012) further operationalized health literacy through a comprehensive integrative model encompassing access, understanding, appraisal, and application across healthcare, disease prevention, and health promotion domains. Their European Health Literacy Survey revealed that nearly 47% of respondents demonstrated limited health literacy levels, with strong associations between literacy deficits and poorer health outcomes (Sørensen et al., 2015).

When contextualized within parenting, these dimensions acquire amplified developmental implications. Parents serve as mediators between health systems and children; thus, deficiencies in functional literacy may result in medication dosing errors, misinterpretation of vaccination schedules, or delayed preventive visits (Yin et al., 2017). Conversely, interactive and critical literacy determine the extent to which parents question misleading nutritional marketing, interpret digital health information, or negotiate behavioral routines within family contexts.

Importantly, health literacy operates not only as an individual cognitive attribute but as a socially distributed resource shaped by education level, socioeconomic status, gender norms, and cultural capital (Berkman et al., 2011). In Arab contexts, disparities in educational access and health communication infrastructures may produce heterogeneous parental literacy profiles, whereas Western healthcare systems increasingly integrate literacy-sensitive communication strategies (OECD, 2021). This structural embedding suggests that parental health literacy must be analyzed within ecological frameworks rather than isolated psychological constructs.

### **3.2 Social Learning Theory and Behavioral Modeling**

One of the most influential theoretical frameworks explaining the transmission of health behaviors from parents to children is Social Learning Theory, developed by Bandura (1977). The theory posits that behavior is learned through observation, imitation, and reinforcement within social environments.

Within family systems, children observe parental dietary patterns, physical activity habits, hygiene routines, and digital engagement practices. When parents consistently model balanced nutrition, structured mealtimes, and active lifestyles, children internalize these behaviors as normative. Conversely, sedentary parental patterns predict higher screen exposure and reduced physical activity among children (Xu et al., 2015).

Parental health literacy strengthens or weakens this modeling process. Parents with higher critical literacy are more likely to demonstrate reflective decision-making—reading food labels, limiting

ultra-processed foods, encouraging outdoor activities despite digital temptations. Thus, literacy functions as a cognitive regulator shaping the quality of modeled behavior.

However, Social Learning Theory alone does not fully explain discrepancies between knowledge and practice. Many parents are aware of nutritional guidelines yet struggle to implement them consistently. This gap necessitates integration with cognitive-decisional models.

### **3.3 The Health Belief Model and Preventive Decision-Making**

The Health Belief Model (HBM) offers insight into preventive behavior adoption by emphasizing perceived susceptibility, perceived severity, perceived benefits, and perceived barriers (Rosenstock, 1974).

Parental health literacy influences each HBM component. Functional literacy allows comprehension of risk statistics; interactive literacy facilitates dialogue with healthcare providers about disease susceptibility; critical literacy enhances evaluation of barriers such as cost, time, or cultural norms.

Empirical evidence demonstrates that parents with higher health literacy levels exhibit greater vaccination compliance and preventive screening adherence (Morrison et al., 2018). This is consistent with HBM assumptions: when perceived severity and benefits outweigh barriers, preventive action is more likely.

In Arab contexts, cultural perceptions of disease causality and reliance on informal advice networks may modify HBM pathways. For example, certain vaccine hesitancy patterns are influenced not solely by literacy deficits but by trust dynamics and misinformation diffusion through social media (WHO, 2022). Therefore, literacy must be interpreted in conjunction with sociocultural belief systems.

### **3.4 Ecological Systems Theory and Contextual Moderation**

Bronfenbrenner's Ecological Systems Theory (1979) situates child development within nested environmental systems: microsystem, mesosystem, exosystem, and macrosystem.

Parental health literacy operates within the microsystem but is shaped by exosystem factors such as healthcare accessibility and educational policy. In Western societies, institutionalized school-based health programs reinforce parental efforts, creating mesosystemic coherence between family and school. In contrast, variability in public health integration across some Arab countries may produce inconsistencies between institutional messaging and family practices.

The World Health Organization highlights that social determinants—including income inequality, urbanization, and education level—strongly predict childhood obesity and preventive healthcare access (WHO, 2023). Thus, parental literacy effects are moderated by macrostructural conditions.

This ecological framing explains why similar literacy levels may produce different behavioral outcomes across contexts. For instance, a health-literate parent in an environment lacking safe recreational spaces may struggle to translate knowledge into physical activity routines for children.

### **3.5 Theory of Planned Behavior and Lifestyle Regulation**

The Theory of Planned Behavior (Ajzen, 1991) posits that behavior is predicted by attitudes, subjective norms, and perceived behavioral control.

Parental health literacy influences all three determinants. Critical literacy shapes attitudes toward ultra-processed foods and sedentary habits. Interactive literacy enhances negotiation within family networks and resistance to social pressures. Functional literacy strengthens perceived behavioral control by enabling accurate interpretation of health guidelines.

Studies demonstrate that parents with higher educational and literacy levels show stronger intentions to regulate children's sugar intake and screen time, although implementation varies depending on environmental constraints (Scaglioni et al., 2018).

The TPB framework is particularly relevant for understanding why awareness of risks does not automatically translate into action. In contexts where social norms normalize high-calorie diets or excessive digital consumption, subjective norms may override literacy-based intentions.

### **3.6 Integrative Theoretical Synthesis**

Synthesizing these models reveals that parental health literacy operates through multiple mechanisms:

- As a cognitive filter (Health Belief Model)
- As a behavioral modeling enhancer (Social Learning Theory)
- As an ecologically moderated determinant (Ecological Systems Theory)
- As a behavioral intention regulator (Theory of Planned Behavior)

The integrative perspective suggests that:

- Functional literacy primarily predicts structured preventive behaviors.
- Interactive literacy enhances healthcare navigation and communication.
- Critical literacy is the most decisive factor for sustained lifestyle regulation (nutrition, physical activity, screen management).

This multidimensional framework provides the conceptual foundation for the comparative empirical analysis that follows.

## **4. Empirical Evidence and Comparative Analysis Across Arab and Western Contexts**

### **4.1 Global Epidemiological Landscape of Child Health Behaviors**

Any rigorous analysis of parental health literacy must begin by situating child health behaviors within the broader global epidemiological transition. Over the last two decades, international health monitoring systems have consistently documented a marked shift from communicable diseases toward lifestyle-related risk factors emerging early in life. According to the World Health Organization (2023), non-communicable diseases account for approximately 74% of global mortality, with unhealthy diet, physical inactivity, and tobacco exposure identified as leading modifiable risk factors whose behavioral origins can often be traced to childhood socialization processes.

Childhood overweight and obesity constitute one of the most visible manifestations of this transition. Global surveillance data from the World Health Organization estimate that more than 340 million children and adolescents aged 5–19 were overweight or obese in recent assessments, reflecting a dramatic increase compared to 1975 levels. Importantly, this trend is no longer confined to high-income Western societies; middle-income countries across North Africa and the Middle East have reported rapid increases associated with dietary Westernization and urban sedentary patterns (WHO, 2022).

Parallel data from UNICEF (2022) highlight additional behavioral vulnerabilities: insufficient dietary diversity in low- and middle-income contexts, excessive consumption of ultra-processed foods in high-income settings, and early exposure to digital devices exceeding recommended thresholds. Moreover, the Organisation for Economic Co-operation and Development (2021) reports persistent socioeconomic gradients in childhood obesity prevalence within Europe and North America, indicating that structural inequalities intersect with family-level determinants.

These epidemiological realities underscore a central analytical point: while macro-level determinants shape exposure environments, micro-level mediators—particularly parental health literacy—function as proximal regulators translating environmental risks into behavioral outcomes.

#### **4.2 Parental Health Literacy and Preventive Healthcare Behaviors**

Empirical studies conducted in Western contexts consistently demonstrate that limited parental health literacy is associated with lower adherence to preventive healthcare protocols. For instance, Yin et al. (2017) found that parents with inadequate health literacy were significantly more likely to misunderstand medication dosing instructions and less likely to adhere to vaccination schedules. Similarly, Morrison et al. (2018) reported higher rates of emergency department utilization among families with lower health literacy, suggesting limited capacity for preventive navigation of healthcare systems.

These findings are theoretically consistent with the functional dimension of health literacy. Comprehension of immunization calendars, antibiotic dosing intervals, and pediatric screening guidelines requires numeracy and reading skills. When such competencies are compromised, preventive compliance declines.

However, the relationship is not purely technical. Interactive literacy—defined as the capacity to communicate effectively with healthcare professionals—has been shown to predict parents' willingness to ask clarifying questions, seek second opinions, and follow up on preventive appointments (DeWalt & Hink, 2009). Thus, parental literacy influences not only comprehension but also engagement within institutional health systems.

In Arab contexts, available evidence suggests a more heterogeneous pattern. Studies conducted in Gulf countries and parts of North Africa indicate relatively high vaccination coverage rates, often attributable to centralized public health programs (WHO EMRO, 2022). Nevertheless, disparities remain in follow-up screening behaviors and anticipatory guidance utilization. Al-Yateem et al. (2020) observed that while basic immunization compliance was generally high, parental understanding of developmental screening milestones and preventive counseling was uneven, particularly among lower educational strata.

This divergence suggests that centralized institutional frameworks can partially compensate for limited parental functional literacy in preventive domains. However, when preventive behaviors require proactive parental initiative—such as scheduling developmental assessments or interpreting growth charts—literacy disparities become more visible.

### **4.3 Nutritional Practices and the Literacy–Lifestyle Gap**

Nutrition represents the domain where the distinction between functional and critical health literacy becomes most evident. In Western societies, awareness of dietary guidelines is relatively widespread, yet childhood obesity prevalence remains high. Data from the Organisation for Economic Co-operation and Development (2021) indicate that approximately one in five children in OECD countries is overweight or obese, despite extensive public health campaigns promoting balanced diets.

This paradox highlights the insufficiency of functional literacy alone. Parents may understand caloric recommendations but lack the critical literacy required to evaluate aggressive marketing of sugar-sweetened beverages, interpret front-of-package labeling strategies, or resist social norms favoring convenience foods. Scaglioni et al. (2018) argue that parental modeling of dietary patterns is a stronger predictor of child nutrition quality than verbal instruction alone, reinforcing the social learning mechanism.

In Arab societies, rapid nutritional transition has intensified this challenge. Increased availability of ultra-processed foods, coupled with reduced physical activity due to urbanization, has contributed to rising childhood obesity rates in countries such as Saudi Arabia, Kuwait, and Egypt (WHO, 2022). However, qualitative research suggests that in some contexts, traditional beliefs equating plumpness with health persist, influencing parental feeding practices despite awareness of obesity risks.

Thus, critical health literacy—the ability to question cultural assumptions and commercial influences—emerges as a decisive factor in shaping sustainable nutritional behaviors. Functional knowledge may ensure awareness of dietary recommendations, but critical appraisal determines whether such knowledge translates into daily practice.

### **4.4 Physical Activity and Gendered Sociocultural Moderation**

Physical inactivity represents another domain where parental health literacy interacts with sociocultural norms. Globally, the World Health Organization (2023) estimates that 81% of adolescents fail to meet recommended physical activity levels, with girls demonstrating significantly lower participation rates.

In Western contexts, structured extracurricular sports and school-based physical education partially mitigate sedentary tendencies. Parents with higher health literacy are more likely to enroll children in organized activities and to limit screen time (Xu et al., 2015). However, socioeconomic barriers—such as program costs—moderate this relationship.

In certain Arab contexts, gender norms further influence physical activity opportunities. Cultural expectations may limit outdoor participation for girls in specific settings, thereby constraining parental capacity to translate literacy-based intentions into practice. Here, ecological moderation

becomes particularly salient: literacy may shape intention, but environmental and normative constraints regulate feasibility.

#### **4.5 Digital Health Literacy and Screen-Time Regulation**

The digitalization of childhood introduces an additional layer of complexity. Parents are now required not only to interpret medical information but also to navigate online health content, social media influences, and digital marketing targeting children.

UNICEF (2022) reports that children globally are spending increasing hours online, often exceeding recommended limits established by pediatric associations. Excessive screen exposure is associated with sleep disturbances, attention difficulties, and obesity risk.

Digital health literacy—considered an extension of interactive and critical literacy—determines parents' ability to evaluate online content credibility and to establish evidence-based screen-time rules. Western studies indicate that parents with higher digital literacy are more likely to implement structured media-use plans (Livingstone et al., 2017). In contrast, emerging evidence from Middle Eastern contexts suggests variability in parental regulation strategies, influenced by both literacy and sociocultural attitudes toward technology.

#### **4.6 Comparative Integrative Interpretation**

The cross-contextual synthesis reveals several key patterns:

First, functional parental health literacy demonstrates strong associations with structured preventive behaviors across both Western and Arab societies, particularly when institutional frameworks provide clear guidelines.

Second, interactive literacy predicts effective healthcare navigation and professional engagement, with stronger institutional reinforcement observed in Western contexts.

Third, critical health literacy emerges as the most powerful predictor of lifestyle-related behaviors—nutrition, physical activity, and digital regulation—because these domains require continuous decision-making, resistance to environmental pressures, and long-term behavioral consistency.

Fourth, sociocultural and structural moderators shape the strength and expression of these relationships. In contexts where environmental constraints or cultural norms limit behavioral options, literacy alone may be insufficient to produce sustained change.

Thus, parental health literacy functions not merely as informational capacity but as a behavioral governance mechanism embedded within ecological systems. Its influence varies by dimension and by sociocultural setting, thereby explaining why children may adopt certain preventive behaviors while failing to internalize broader healthy lifestyle patterns.

### **5. General Discussion and Theoretical Integration**

The empirical synthesis presented above reveals that parental health literacy operates as a differentiated and context-sensitive determinant of children's health behaviors. However, beyond descriptive associations, a deeper theoretical integration is necessary to clarify *why*

certain dimensions of literacy predict specific behavioral domains and *how* sociocultural contexts moderate these relationships.

### **5.1 Differential Predictive Power of Health Literacy Dimensions**

The evidence suggests that functional health literacy demonstrates strong predictive capacity for structured and protocol-driven preventive behaviors, such as vaccination adherence, medication dosing accuracy, and routine pediatric check-ups (Yin et al., 2017; Morrison et al., 2018). These behaviors are typically governed by formal institutional schedules and standardized medical guidelines. Consequently, comprehension skills and basic numeracy are sufficient for adequate compliance when health systems are accessible and clearly structured.

However, when behavioral domains require sustained daily decision-making—such as regulating sugar intake, structuring balanced meals, promoting physical activity, and limiting screen exposure—functional literacy alone appears insufficient. Here, critical health literacy becomes decisive. Nutbeam (2000) conceptualized critical literacy as the ability to analyze information and exert greater control over life determinants. This analytic capacity enables parents to evaluate commercial food marketing strategies, interpret nutritional labeling beyond superficial health claims, and question digital misinformation that may normalize sedentary lifestyles.

Empirical nutrition research supports this interpretation. Scaglioni et al. (2018) emphasize that parental modeling exerts stronger influence on children’s dietary patterns than informational instruction. Thus, critical literacy shapes not only cognitive awareness but behavioral embodiment. Parents who internalize health guidelines at a critical-reflective level are more likely to integrate them into daily routines rather than treat them as abstract recommendations.

Interactive health literacy, positioned between functional and critical levels, plays a mediating role. It enhances communication with healthcare providers and strengthens engagement with preventive counseling. DeWalt and Hink (2009) demonstrate that parents who actively seek clarification and discuss concerns with pediatricians are more likely to maintain continuity of care. Therefore, interactive literacy contributes to consistency in healthcare navigation, though it may not independently predict lifestyle restructuring without critical engagement.

From a theoretical standpoint, these differentiated effects align with the Theory of Planned Behavior (Ajzen, 1991). Functional literacy strengthens perceived behavioral control in structured settings. Interactive literacy influences subjective norms through dialogical engagement with professionals. Critical literacy shapes attitudes and evaluative judgments, thereby exerting the strongest influence on intention formation and sustained behavioral execution.

### **5.2 Sociocultural Moderation: Arab and Western Contexts**

The comparative analysis between Arab and Western societies reveals that parental health literacy does not operate in a sociocultural vacuum. Rather, its behavioral translation is mediated by macrostructural and normative frameworks.

In many Western contexts, institutional health systems integrate literacy-sensitive communication strategies and school-based health education programs. According to the Organisation for Economic Co-operation and Development (2021), preventive care utilization rates remain comparatively high, and structured extracurricular activities support physical

engagement. Consequently, parental literacy interacts with supportive infrastructures that facilitate implementation.

Nevertheless, Western societies face persistent lifestyle contradictions. Despite widespread awareness of nutritional risks, ultra-processed food consumption remains elevated. The World Health Organization (2023) identifies aggressive marketing and convenience-oriented food environments as systemic drivers of unhealthy diets. This indicates that even in high-literacy contexts, environmental saturation can weaken literacy–behavior translation unless critical appraisal skills are robust.

In Arab societies, the landscape is more heterogeneous. Rapid urbanization, dietary Westernization, and expanding digital penetration have transformed childhood health risk profiles. The World Health Organization Eastern Mediterranean regional reports (2022) show rising childhood overweight prevalence exceeding 20% in several countries, coupled with insufficient physical activity levels, particularly among adolescent girls.

However, preventive vaccination coverage in many Arab states remains relatively strong due to centralized public health campaigns. This pattern supports the earlier distinction: structured institutional interventions can compensate for limited parental literacy in preventive domains, whereas lifestyle behaviors—less institutionally regulated—remain more vulnerable to literacy disparities.

Cultural norms further modulate behavior. In certain contexts, traditional perceptions equating physical robustness with health may dilute parental concern regarding childhood overweight. Similarly, gendered expectations may restrict physical activity opportunities for girls, regardless of parental literacy levels. These dynamics illustrate Bronfenbrenner’s ecological principle (1979): macrosystemic norms shape microsystemic behavioral possibilities.

Thus, while the structural integration of health literacy appears stronger in Western systems, sociocultural moderation remains relevant in both settings. Literacy predicts intention, but ecological feasibility regulates enactment.

### **5.3 The Knowledge–Behavior Gap Reconsidered**

A recurring paradox across contexts is the persistence of unhealthy child behaviors despite parental awareness of health guidelines. This “knowledge–behavior gap” has been widely documented in behavioral science (Sørensen et al., 2015). The present integrative analysis suggests that the gap is not simply a matter of informational deficiency but of insufficient critical and ecological alignment.

Functional awareness (e.g., knowing that excessive sugar is harmful) does not guarantee daily enforcement of dietary limits. Behavioral consistency requires motivational regulation, environmental structuring, and resistance to normative pressures. Critical literacy enhances evaluative reasoning, but without supportive mesosystemic reinforcement—such as school policies or community infrastructure—implementation may remain fragile.

In digital domains, this gap is particularly pronounced. UNICEF (2022) reports widespread parental concern regarding excessive screen time, yet enforcement remains inconsistent. Here, digital health literacy becomes central. Parents must assess online content credibility, establish

technological boundaries, and model moderated digital engagement. The absence of critical digital appraisal may result in normalization of prolonged exposure despite risk awareness.

Therefore, the knowledge–behavior gap can be reframed as a multidimensional misalignment between functional literacy, critical appraisal, ecological feasibility, and sociocultural reinforcement.

#### **5.4 Mechanisms of Selective Behavioral Adoption**

The central question of this article concerns why children adopt certain health behaviors while neglecting others. The integrative theoretical–empirical evidence suggests three principal mechanisms:

First, **institutional structuring effect**: Behaviors embedded within formal systems (vaccination schedules, school screenings) are more likely to be adopted when minimal functional literacy is present.

Second, **behavioral modeling effect**: Lifestyle behaviors dependent on daily parental modeling (nutrition, physical activity) are influenced by the depth of internalized health norms, strongly linked to critical literacy (Scaglioni et al., 2018).

Third, **ecological constraint effect**: Environmental, cultural, and socioeconomic conditions moderate literacy translation, explaining cross-context differences even at similar literacy levels.

Thus, parental health literacy does not uniformly influence all behavioral domains. It selectively determines outcomes depending on behavioral complexity, institutional embedding, and ecological moderation.

### **6. Conclusion and Policy Implications**

#### **6.1 General Conclusion:**

The present theoretical–empirical integrative analysis set out to examine how parental health literacy determines the manifestation of children’s health behaviors across Arab and Western contexts. Moving beyond descriptive associations, the findings collectively support a central conclusion: *parental health literacy functions as a multidimensional behavioral governance mechanism whose influence varies according to behavioral domain, sociocultural context, and institutional structuring.*

First, the evidence consistently demonstrates that functional parental health literacy predicts adherence to structured preventive health behaviors, including vaccination compliance, medication accuracy, and scheduled pediatric follow-up (Yin et al., 2017; Morrison et al., 2018). These behaviors are embedded within formal healthcare systems, and thus rely primarily on comprehension and basic numeracy skills. In contexts where institutional frameworks are robust—whether in Western systems or centralized Arab public health programs—functional literacy appears sufficient to ensure acceptable compliance levels.

Second, interactive health literacy enhances healthcare navigation and professional communication. Parents capable of engaging in dialogue with pediatricians, requesting

clarification, and actively participating in shared decision-making demonstrate greater continuity of preventive care (DeWalt & Hink, 2009). This dimension strengthens trust-based healthcare relationships and mitigates misunderstandings.

However, the most decisive findings concern the domain of lifestyle-related behaviors. Nutrition quality, physical activity structuring, sleep regulation, and digital exposure management are not governed by episodic institutional mandates; rather, they require sustained daily decision-making within the family microenvironment. Here, *critical health literacy emerges as the strongest predictor of consistent healthy behavioral adoption*. As conceptualized by Nutbeam (2000), critical literacy enables parents to analyze competing information, question commercial marketing of ultra-processed foods, and resist sociocultural normalization of sedentary habits.

Global epidemiological data underscore the urgency of this distinction. Despite widespread awareness campaigns, the World Health Organization (2023) continues to report high prevalence of childhood overweight and insufficient physical activity globally. This persistence indicates that informational exposure alone does not guarantee behavioral transformation. Instead, behavioral consistency appears contingent upon parents' capacity for critical appraisal and ecological regulation.

The comparative analysis further demonstrates that sociocultural moderation shapes literacy–behavior translation. In Western societies, institutional integration of health promotion within school systems and healthcare infrastructures provides reinforcement mechanisms (OECD, 2021). Nevertheless, environmental saturation with ultra-processed foods and digital marketing creates competing pressures that require strong critical literacy to overcome.

In Arab societies, rising childhood obesity and insufficient physical activity documented by the World Health Organization Eastern Mediterranean regional reports (2022) reflect rapid nutritional and urban transitions. While preventive vaccination coverage remains relatively strong in many states due to centralized programs, lifestyle behaviors reveal greater variability, influenced by educational disparities, gender norms, and environmental constraints.

Thus, the central thesis of this article can be articulated as follows:

*Parental health literacy does not uniformly determine all child health behaviors; rather, its influence is behavior-specific, dimension-dependent, and ecologically moderated. Functional literacy predicts preventive compliance, while critical literacy governs sustained lifestyle regulation.*

This differentiated understanding resolves the apparent paradox whereby children may adhere to vaccination schedules yet simultaneously exhibit unhealthy dietary and sedentary patterns.

## **6.2 Final Synthesis**

In conclusion, parental health literacy constitutes a foundational determinant of children's health behavior patterns, yet its influence is neither monolithic nor automatic. It operates through differentiated dimensions—functional, interactive, and critical—each exerting selective effects depending on behavioral complexity and sociocultural ecology.

Children adopt preventive behaviors when parental functional literacy aligns with institutional structuring. They internalize lifestyle behaviors when parental critical literacy translates

knowledge into embodied modeling. And they sustain healthy patterns when ecological conditions support literacy-based intentions.

Understanding this layered relationship provides a conceptual foundation for culturally responsive, family-centered health promotion strategies capable of addressing the contemporary challenges of childhood health across Arab and Western societies.

### **6.3 Theoretical Contributions**

This study advances the literature in three principal ways.

First, it integrates Nutbeam's multidimensional literacy model with Social Learning Theory (Bandura, 1977), the Health Belief Model (Rosenstock, 1974), Ecological Systems Theory (Bronfenbrenner, 1979), and the Theory of Planned Behavior (Ajzen, 1991) into a unified explanatory framework. This synthesis clarifies how literacy operates simultaneously as a cognitive filter, modeling enhancer, intention regulator, and ecologically moderated determinant.

Second, it provides a cross-cultural comparative lens rarely integrated within health literacy research, highlighting how similar literacy levels may yield divergent behavioral outcomes depending on macrostructural and cultural conditions.

Third, it reframes parental health literacy as a *behavioral governance mechanism* rather than merely an informational variable. This conceptual shift emphasizes regulatory capacity and normative embodiment.

### **6.4 Policy and Practice Implications**

The findings carry significant implications for public health policy and educational programming.

#### **1. Moving Beyond Functional Literacy Campaigns**

Many public health interventions focus primarily on disseminating informational brochures or awareness messages. While essential, such approaches predominantly target functional literacy. The evidence presented here indicates that critical health literacy development should become a strategic priority. Programs must train parents to evaluate marketing claims, interpret nutritional labeling, and critically assess digital health content.

#### **2. Integrating Family-Centered Health Education**

School-based programs should be synchronized with parental education initiatives to strengthen mesosystemic coherence, as emphasized by Ecological Systems Theory (Bronfenbrenner, 1979). In both Arab and Western contexts, coordinated family-school partnerships can amplify behavioral modeling consistency.

#### **3. Addressing Structural Moderators**

Policymakers must recognize that literacy alone cannot overcome structural barriers. Safe recreational infrastructure, regulation of unhealthy food marketing targeting children, and digital platform accountability are essential complementary strategies. The World Health Organization (2023) advocates multisectoral action to combat childhood obesity, reinforcing this ecological perspective.

#### 4. Digital Health Literacy Development

Given the expanding digital ecosystem, parental digital literacy training should be integrated into primary healthcare and community education programs. UNICEF (2022) emphasizes the growing influence of digital exposure on child well-being, making this an urgent policy frontier.

#### 6.5 Limitations and Future Research Directions

Although this article integrates empirical evidence from diverse contexts, it remains a theoretical–empirical synthesis rather than an original field-based dataset. Future research should employ longitudinal designs to measure causal pathways between parental literacy dimensions and specific behavioral trajectories. Additionally, culturally specific measurement tools are needed to capture critical literacy nuances within Arab societies.

Cross-national comparative surveys utilizing standardized literacy instruments (e.g., European Health Literacy Survey methodology) could further refine understanding of contextual moderators (Sørensen et al., 2015).

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