Millennial Parents' Health and Nutrition Literacy: A Survey in Tangerang Regency

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ABSTRACT
This study aims to analyze the level of health and nutrition literacy among millennial parents in Tangerang Regency, a strategic demographic due to their high exposure to digital technology and frequent involvement in child-health decision-making. A descriptive quantitative approach was employed involving 160 respondents selected through purposive sampling from several districts. Data were collected using an online questionnaire consisting of 26 items adapted from established health literacy frameworks and nutrition literacy instruments, covering four key dimensions: nutrition knowledge, information-seeking behavior, child-feeding practices, and utilization of health services. Descriptive statistics were used to map literacy patterns and parental practices. Findings indicate that 86.2 percent of respondents understand the concept of balanced nutrition, yet only 20.7 percent consistently read food labels. Additionally, 53.4 percent seldom apply nutrition information in daily routines, suggesting that nearly half of the participants have not yet translated their literacy into effective practice. Most respondents rely on social media platforms for information, while the use of official sources and health professionals remains limited. Based on health literacy frameworks, the majority fall within the functional literacy level, with relatively limited critical literacy skills. These results highlight the need for community-based and digital education interventions to strengthen practical and evaluative competencies in making informed family nutrition decisions.

INTRODUCTION

Over the past few decades, demographic and digital transformations have reshaped parenting practices, particularly among millennial parents. This generation, born between 1981 and 1996, is characterized by high exposure to digital technology and a strong reliance on online information in everyday decision-making, including those related to children's health and nutrition (Prensky, 2009). In Indonesia, rapid digitalization has increased access to health and nutrition information, yet the abundance of online content is not matched by adequate evaluative skills. Many parents still struggle to filter, interpret, and apply information accurately in their caregiving routines. This gap directly affects the quality of parenting, especially in preventing nutrition-related problems such as stunting.

Health literacy and nutrition literacy refer to the ability of individuals to access, understand, evaluate, and apply essential information related to health and nutrition for effective decision-making (Nutbeam, 2008). Within the context of parenting, these literacies function as core competencies that determine how parents identify symptoms, choose appropriate foods, interpret nutrition labels, and respond to health risks faced by young children. Adequate literacy enables parents to prevent chronic undernutrition as well as overnutrition. Conversely, low literacy has been associated with poor feeding practices, delayed responses to early symptoms, and susceptibility to misinformation, which may exacerbate both stunting and obesity risks (Ahmadi & Karamitanha, 2023; Pawellek et al., 2024).

Tangerang Regency represents a rapidly expanding urban fringe whose socio-demographic profile shapes millennial parents' literacy dynamics. Significant population growth driven by migration and industrial development has produced disparities in income stability, housing, and access to health

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information Central Bureau of Statistics (Badan Pusat Statistik, 2023). Although urbanization has improved physical infrastructure, several districts including Kronjo, Mekar Baru, and Sukadiri still report limited health facility coverage. Stunting prevalence remains at 17.3%, higher than the national target of 14% (Kementerian Kesehatan Republik Indonesia Badan Kebijakan Pembangunan Kesehatan, 2023). At the same time, smartphone penetration reaches 89% of households, yet digital health literacy remains low, with many parents relying on unverified online content for child-health decisions. This paradox that high connectivity but low evaluative competence highlights the need for contextually grounded techno-parenting strategies tailored to millennial families.

International evidence shows that health and nutrition literacy among young parents is a critical foundation for effective interventions (Bodie & Dutta, 2008; Sørensen et al., 2012). In Indonesia, however, research remains limited and tends to focus on general populations rather than the millennial parent cohort. Existing studies mostly examine health literacy among mothers of toddlers, digital parenting behavior, or specific nutrition-education programs (Apriliani & Utami, 2021; Rachmah et al., 2020; Syawitri & Sefrina, 2022). Few studies integrate both health and nutrition literacy within a millennial context or explore how these literacies operate in rapidly changing peri-urban areas such as Tangerang. The novelty of this study lies in its combined focus on millennial parents as a distinct digital-native group with unique information-processing behaviors, the socio-demographic characteristics of Tangerang Regency, and a dual mapping approach that jointly examines health literacy and nutrition literacy.

This integrated perspective remains underrepresented in Indonesian research and is essential for designing techno-parenting models aligned with the realities of digital-era families. Against this background, this study aims to assess the levels of health and nutrition literacy among millennial parents in Tangerang Regency using a descriptive quantitative approach. The results are expected to provide an empirical foundation for developing evidence-based parenting interventions and public policies that strengthen early childhood health in the digital era.

METHOD

This study employed a descriptive quantitative survey approach, selected for its suitability in generating standardized and comparable measurements of health and nutrition literacy across a large respondent group. The sample size of 160 millennial parents was determined based on recommendations for minimum adequacy in descriptive survey research, which typically requires 100–200 respondents to ensure stable estimates and sufficient statistical precision (Creswell, 2012). The sample also reflected demographic heterogeneity across multiple districts in Tangerang Regency, thereby enabling variation in education, occupation, and access to health and nutrition information to be captured. Prior to the main data collection, a pilot test with 25 millennial parents was conducted to evaluate item clarity, cultural appropriateness, and technical usability of the online questionnaire, resulting in refinements to wording, instructions, and item ordering. The final instrument consisted of 26 items covering four dimensions like nutrition knowledge, information-seeking behaviors, child-feeding practices, and utilization of health services, with indicators such as understanding balanced diets, evaluating digital health information, label-reading behaviors, and engagement with formal health systems. Reliability testing produced Cronbach's alpha coefficients between 0.78 and 0.86, consistent with standards in health literacy research (Ickes et al., 2014; Sørensen et al., 2012). Data analysis employed descriptive statistics after rigorous data cleaning, including removal of inconsistent answers, straight-lining, unusually short completion times, and incomplete submissions. Quality assurance procedures incorporated attention-check items and technical controls such as duplicate-submission restrictions and IP monitoring to ensure data validity. The overall research workflow included instrument adaptation, expert review, pilot testing, questionnaire refinement, online dissemination, data collection, quality verification, data cleaning, and finally analytical interpretation, ensuring methodological rigor and credible findings regarding millennial parents' health and nutrition literacy.

RESULT AND DISCUSSION

Descriptive and subgroup analyses were conducted to examine variations in health and nutrition

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literacy among millennial parents in Tangerang Regency. The mean nutritional knowledge score was 3.87 (SD = 0.64), reflecting a generally adequate understanding of basic nutrition concepts. However, the gap between knowledge and actual practice was evident. Parents with undergraduate degrees or higher showed stronger nutritional knowledge (M = 4.12, SD = 0.51) than those with only a high school education (M = 3.54, SD = 0.71). Similar trends appeared in nutrition label–reading behaviors: employed mothers consistently read labels more frequently (32.5%) than unemployed mothers (18.4%).

Digital exposure also shaped literacy levels. Respondents working in professional sectors that were characterized by wider access to digital resources, reported greater confidence in cross-referencing online content, comparing multiple information channels, and interpreting health messages. However, the majority of respondents displayed a narrower digital-information repertoire, relying predominantly on Instagram, YouTube, and TikTok, which typically provide fragmented and entertainment-driven content rather than structured health information.

Overall, results indicate that most millennial parents possess functional literacy, enabling them to recognize basic nutrition terminology (e.g., balanced diet, portion size) but not yet equipping them to evaluate the credibility of online content or translate information into consistent feeding practices. Indicators of interactive or critical literacy were present only in a small subset of parents—for example, those who reported "checking product composition across brands before purchasing" or "validating online nutrition tips with Puskesmas officers."

Table 1. Survey Results on Health and Nutrition Literacy among Millennial Parents in Tangerang Regency

Indicator	Percentage (%)
Familiar with the concept of balanced nutrition	86.2
Unfamiliar with the concept of balanced nutrition	13.8
Consistently read nutrition labels on packaged food	20.7
Rarely read nutrition labels on packaged food	53.4
Main information sources: social media	Majority
Official sources (government sites/healthcare)	Low

As shown in Table 1, 86.2% of respondents were familiar with the concept of balanced nutrition, although only 20.7% consistently read nutrition labels, while more than half (53.4%) rarely did so. Social media emerged as the dominant information source, whereas the use of official health sources remained low. Collectively, these findings highlight uneven patterns of knowledge, skills, and information access within the population.

Findings demonstrate that millennial parents in Tangerang Regency predominantly operate at the functional literacy level as conceptualized by Nutbeam (2008). This level is characterized by individuals' ability to understand basic health or nutrition concepts but with limited capacity to analyze, evaluate, or apply information in more complex contexts. Such interpretation aligns with extended critiques of health literacy showing that functional-level skills often fail to predict real-life behavioral application (Chinn, 2011; Paakkari & Paakkari, 2012). Their ability to understand basic nutritional concepts is relatively strong, yet this proficiency is not complemented by higher-order skills such as evaluating reliability, interpreting risk, or integrating information into daily decisions. The limited consistency between stated knowledge (86.2% familiar with balanced nutrition) and behavior (only 20.7% consistently reading labels) reinforces that respondents remain at an early stage of literacy development. This knowledge–behavior gap is consistent with findings that label reading and evidence-based dietary decision-making require higher literacy thresholds (Miller & Cassady, 2015; Rothman et al., 2006).

A minority of parents exhibited behaviors aligned with interactive literacy, such as engaging in dialogues with health workers, or seeking clarification when conflicting information appeared online. Even fewer demonstrated critical literacy, such as systematically cross-checking nutrition information across multiple reputable sources or critically evaluating influencer content. These patterns align with the Health Literacy model (eHEALS) proposed by Norman & Skinner (2006), which outlines six digital competencies: information seeking, appraisal, understanding, application, communication, and self-efficacy. Within this framework, most respondents demonstrated strength only in the locating function

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(i.e., finding information through social media), but weaker capability in appraising, applying, and communicating evidence-based information.

The context of Tangerang Regency as an urban-fringe region with high digital penetration, where 89 percent of millennial parents own a smartphone, creates a paradox between connectivity and competence that is reflected in the empirical patterns of this study. Despite the ease of accessing digital information, disparities in health-service availability remain pronounced in districts such as Kronjo, Mekar Baru, and Sukadiri, shaping parents' reliance on online sources rather than professional guidance. This condition increases exposure to unverified nutrition content circulating on social media, aligning with Zarnowiecki et al. (2020), who found that Indonesian parents frequently encounter misleading diet and child-feeding information online. The findings of this study further demonstrate that parents with high digital access but limited evaluative skills tend to exhibit lower accuracy in interpreting nutrition recommendations, reinforcing evidence that low nutrition literacy is associated with suboptimal feeding decisions (Metri & Puspitarini, 2024). Together, these contextual and behavioral dynamics help explain the uneven literacy outcomes observed among millennial parents in Tangerang, particularly the discrepancies between perceived digital competence and actual health-nutrition decision-making competence.

To address this mismatch, literacy interventions must align with parents' mobile-first consumption habits. Micro-learning has emerged as a strategic modality for maternal and child-health education due to its brevity, simplicity, and compatibility with everyday digital routines, consistent with findings by Rahmawati et al. (2019). For millennial parents in Tangerang, feasible micro-learning formats include short WhatsApp video capsules that explain food-label interpretation and basic nutrient thresholds; carousel infographics distributed through PAUD or TK WhatsApp groups summarizing weekly feeding tips; and brief audio reminders disseminated through Posyandu ahead of immunization or weighing days. These formats reduce cognitive load, increase recall, and mirror the rapid-consumption patterns typical of contemporary digital communication, making them well suited to support continuous reinforcement of nutrition messages.

Embedding micro-learning within existing community structures requires coordinated, cross-sectoral implementation. Puskesmas can validate and integrate micro-learning modules into routine maternal and child-health visits, ensuring accuracy and consistency that a recommendation aligned with community-health convergence models described by Brown & Ogden (2004). Posyandu can disseminate micro-learning materials during monthly growth-monitoring activities, providing timely cues that support behavioral change. Meanwhile, PAUD and TK can facilitate techno-parenting sessions and short label-reading demonstrations within parent meetings, complementing digital content with hands-on learning. Such inter-institutional collaboration is essential for helping parents progress from functional to interactive and ultimately critical nutrition literacy ((Aisyah et al., 2025), while ensuring that learning is reinforced across digital environments and real-world community touchpoints. Collectively, these efforts underscore that improving millennial parents' nutrition literacy in Tangerang requires not merely information dissemination, but the cultivation of evaluative, practical, and digital competencies that reflect both their media ecosystem and local health-service realities.

CONCLUSION

This study reveals the nuanced and multifaceted nature of health and nutrition literacy among millennial parents in Tangerang Regency. Although the majority of respondents demonstrated a foundational understanding of balanced nutrition, significant discrepancies remain between awareness and consistent implementation of healthful practices, such as reading nutrition labels or consulting credible sources. The findings further suggest that most parents operate within the realm of functional literacy, with limited development toward critical literacy as conceptualized in Nutbeam's health literacy model. These insights underscore the urgent need for public health strategies that not only disseminate information but also emphasize the development of evaluative and practical competencies necessary for informed decision-making in daily parenting practices. Building on these findings, several targeted recommendations emerge. Intervention programs should prioritize practical, skill-based learning activities, such as guided food-label reading sessions, digital information evaluation workshops, and community-based nutrition coaching to strengthen parents' capacity to assess and apply health

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information. Policymakers may also consider integrating digital nutrition literacy modules into maternal and child health services, collaborating with local health centres, early childhood education institutions, and trusted digital parenting platforms to broaden outreach and ensure relevance to millennial families.

While the study focuses specifically on Tangerang Regency, the empirical analysis revealed recurring patterns particularly the reliance on social media as a primary source of health and nutrition information, the persistent gap between parental knowledge and daily caregiving practices, and the influence of demographic factors such as education level, digital exposure, and household structure that appear applicable to other rapidly urbanizing areas with comparable socio-demographic characteristics. These patterns collectively illustrate how digital information ecosystems, parental health literacy, and contextual socio-economic conditions interact to shape decision-making processes related to early childhood nutrition. The findings further suggest that millennial parents' accessibility to digital platforms does not necessarily translate into improved critical evaluation of health information, indicating that techno-parenting interventions must go beyond functional literacy and address deeper interpretive skills. Taken together, these insights position Tangerang Regency as both a representative and a cautionary case for understanding how digital environments influence family health behaviors in contemporary Indonesian contexts.

Nonetheless, contextual differences across regions should be considered when interpreting these findings. Despite its strengths, this study is limited by its reliance on self-reported data and its geographically localized sample. Future research could expand the demographic scope and employ mixed methods or longitudinal designs to examine how digital health education, parenting practices, and nutrition literacy interact over time. Further studies may also explore questions such as: How do different forms of digital content influence parents' nutrition decision making? What factors facilitate the transition from functional to critical literacy among millennial parents? To what extent do community-based interventions produce sustained improvements in early childhood nutrition outcomes? Addressing these questions would provide deeper insights into long-term strategies for improving family health literacy in Indonesia's evolving digital landscape.

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