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Healthy Lifestyle Education Through Play-Based Learning among Children Aged Three to Four Years: A Case Study in Indonesia

Prima Trisna Aji¹, Elinda Rizkasari², Arief Shofyan Baidhowy³

¹ Lincoln College University, Malaysia

² Universitas Slamet Riyadi Surakarta, Indonesia

³ Universitas Muhammadiyah Semarang, Indonesia

Abstract

This study explores the implementation of healthy lifestyle education through play-based learning in early childhood education settings. Early childhood is a critical developmental stage during which children begin to form daily habits related to nutrition, hygiene, physical activity, rest, and emotional well-being. This qualitative case study was conducted in a pseudonymized early childhood education center in Indonesia and focused specifically on children aged 3–4 years ($n = 15$) over a two-week observation period. Data were collected through classroom observations, semi-structured interviews with the classroom teacher, and documentation of learning activities. The findings revealed that integrating health-related content into play-based activities encouraged active participation and meaningful learning. Twelve out of fifteen children consistently demonstrated improved hand-washing routines, greater willingness to engage in physical movement activities, and increased awareness of healthy food choices during the observation period. These changes were identified through systematic observation and teacher reflection rather than formal behavioral scoring. Parental involvement played an important role in reinforcing health-related routines at home, contributing to behavioral consistency across settings. Teachers reported that play-based learning made health education more natural, developmentally appropriate, and enjoyable for children. In this study, internalization is understood as children's consistent and self-initiated enactment of healthy behaviors within play and daily routines, supported by social interaction and repetition, rather than explicit verbal understanding of underlying health concepts. This study contributes to the literature by demonstrating how healthy lifestyle behaviors can be naturally embedded in early learning routines for children aged 3–4 years without direct instruction, expanding understanding of play-based learning as a mediating pathway for early health-habit internalization within Asian early childhood education contexts.

Keywords: Early Childhood, Health Education, Healthy Lifestyle, Parental Involvement, Play-based Learning

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Corresponding author: Prima Trisna Aji, Email Address: phd.prima@lincoln.edu.my (Selangor Darul Ehsan, Malaysia)

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Introduction

Early childhood represents a foundational developmental period in which children begin to construct daily routines and lifestyle habits that may persist into adolescence and adulthood. Research in early childhood education consistently emphasizes that healthy behaviors established in the early years strongly influence children's growth, cognitive functioning, emotional development, and long-term well-being. However, many young children still experience unhealthy lifestyle patterns, including poor dietary habits, limited physical activity, and inconsistent hygiene routines, which remain a concern in early childhood education settings where children spend a significant portion of their daily lives (Pate et al., 2020).

Healthy lifestyle education in early childhood therefore requires strategies that are developmentally appropriate, engaging, and meaningful for young learners (World Health Organization, 2019). Conventional teacher-centered instruction tends to rely on verbal explanations and rule-based reminders, which may not

align with the way young children naturally learn. Early childhood learners construct understanding through interaction, imitation, movement, exploration, and symbolic play. If health education is presented in ways that are disconnected from children's everyday play experiences, the internalization of healthy habits may remain superficial rather than embodied in daily routines (Chundung Gyang Pam, Jacinta M Adhiambo, 2020).

Play-based pedagogy provides an alternative approach that integrates health concepts into joyful and meaningful activities. Within developmentally appropriate frameworks, play is regarded as a central mechanism through which young children make sense of the world and rehearse real-life roles and routines (Mayer, 2024). Similarly, learning theories explain how children observe, model, and reproduce behaviors through interaction and guided participation. When embedded in play, health-related routines such as hand-washing, healthy eating, physical movement, and self-care may be practiced repeatedly in authentic social contexts, supporting children's motivation and emotional engagement in learning (Severino et al., 2024). Although previous studies have demonstrated the benefits of play-based learning, these have predominantly focused on cognitive and socio-emotional outcomes (Mayer, 2024). However, existing studies have largely examined play-based learning from cognitive and socio-emotional perspectives, leaving limited empirical understanding of how play mediates the internalization of health-related habits among children aged 3-4 years, particularly within Indonesian early childhood settings (B. Liu et al., 2025).

Existing studies have predominantly examined play-based learning from cognitive and socio-emotional perspectives, while little is known about how play functions as a medium for health-habit internalization among preschool-aged children, particularly in the Indonesian context (Sitorus et al., 2025). This study focuses specifically on children aged 3-4 years because this period represents a sensitive developmental phase in which foundational habits begin to emerge through imitation, repetition, and routine-based participation rather than abstract reasoning (Rahayu & Setiasih, 2022). At this age, children start to develop early self-regulation and autonomy in daily activities such as eating, hygiene, and movement, making them particularly receptive to play-based approaches that embed health behaviors within meaningful social interactions. Moreover, empirical studies focusing on children aged 3-4 years remain limited, despite the importance of this age group for early habit formation. There is also limited research examining how teachers and parents jointly reinforce health-related learning experiences initiated in early childhood education settings. (Henrietta et al., 2022).

Therefore, this study aims to explore how healthy lifestyle education is implemented through play-based learning in early childhood settings using a qualitative case study design (Rizka & Jalal, 2024). The study focuses on the lived experiences of teachers, children, and parents in order to illuminate how health messages are embedded in daily play routines and how these experiences shape children's emerging health behaviors (Pfeiffer et al., 2020). This study contributes to the growing body of scholarship on health-oriented early childhood pedagogy by providing context-sensitive, empirical insights into the mechanisms through which play mediates the internalization of healthy lifestyle habits among very young children (Mapoma & Dagada, 2025b).

2 Methodology

1 Research Design

This study employed a qualitative case study design to explore how healthy lifestyle education is implemented through play-based learning in an early childhood education setting. A case study approach was considered appropriate because it allows for an in-depth understanding of real-life classroom practices and the contextual meanings constructed by teachers, children, and parents, particularly in research on play-based learning and early development (Pfeiffer et al., 2020).

Setting and Participants

The study was conducted in a pseudonymized early childhood education (ECE) center in Central Java, Indonesia. The participants consisted of 15 children aged 3-4 years and one classroom teacher. The sample size is appropriate for a qualitative case study, which prioritizes depth of understanding and contextual richness rather than statistical generalization. In line with qualitative research principles, participants were selected as an

information-rich group within a single bounded case, allowing for detailed observation of play-based learning processes and emerging health-related behaviors. Data collection continued until patterns of behavior and interaction became repetitive and analytically sufficient to support thematic interpretation. The data collection period lasted two weeks, during which play-based activities related to health education were implemented as part of the natural classroom routine. Given the relatively short duration of data collection, observed behavioral changes are interpreted as early indicators of habit formation rather than long-term behavioral outcomes. Parental involvement was encouraged, particularly in reinforcing hand-washing and healthy eating practices at home, in line with previous work emphasizing the role of families in play-based and early childhood learning (Siti Hanifah, 2023).

Researcher Positionality

The first author acted as a non-participant observer to minimize disruption to the natural learning flow. During data collection, the researcher remained physically present in the classroom but did not participate in play activities, instructional interactions, or behavioral guidance. The researcher positioned herself at the periphery of the learning space and refrained from initiating communication with children, intervening in activities, or influencing classroom routines (Wiwik Pudjaningsih, 2020). Observation focused on naturally occurring interactions between children, peers, and the teacher during play-based health-related activities. Field notes were recorded immediately after each observation session to capture behavioral patterns, contextual details, and emerging routines, while interviews with the teacher were conducted outside instructional time. Reflexive awareness was maintained throughout the study through reflective journaling and analytic memos to minimize personal bias during data interpretation, consistent with qualitative approaches used in early childhood and play-based learning research (Setiowati et al., 2025).

Data Collection Procedures

Data were collected using three complementary techniques. First, classroom observations focused on children's participation in play-based activities related to hygiene routines, healthy eating behaviors, and physical movement. Healthy eating was observed through naturalistic indicators, including children's food choices during snack-time routines, verbal expressions about food (e.g., identifying fruits and vegetables as "healthy"), and role-play activities involving pretend food selection and preparation. These indicators were recorded using structured observation notes rather than standardized dietary assessment tools, in order to preserve the natural classroom context. Second, semi-structured interviews were conducted with the classroom teacher to explore pedagogical intentions and reflections on the learning process (Taherun et al., 2025). Third, documentation review was carried out, including lesson plans, teacher journals, and classroom artefacts that captured evidence of health-related learning. Field notes were written immediately after each observation session to retain contextual meaning and preserve the sequence of events. This combination of observations, interviews, and documentation is consistent with data collection strategies commonly used in early childhood studies on play-based learning (Merritt et al., 2020).

Data Analysis

Data were analyzed using thematic analysis. All data were coded manually without the use of qualitative analysis software such as NVivo or ATLAS.ti. The manual coding process began with open coding, in which meaningful segments from interview transcripts, field notes, and documents were identified and labeled. Codes were then compared across data sources and iteratively refined into a preliminary code list. Through constant comparison, related codes were grouped into broader categories, which were subsequently developed into themes. This manual approach enabled close engagement with the data and supported nuanced interpretation of children's behaviors and teacher practices within the play-based learning context. The five iterative stages of analysis included: (1) familiarization, through repeated reading of interview transcripts, field notes, and documents; (2) initial coding; (3) theme generation; (4) theme refinement; and (5) reporting, by organizing the final themes into a narrative that integrates empirical findings with existing theory, consistent with thematic analyses commonly used in early childhood research (Setiowati et al., 2025).

Ethical Considerations

Ethical principles were strictly observed throughout the study and implemented through a clear ethical flow and process. Prior to data collection, formal permission was obtained from the early childhood education institution, followed by written informed consent from parents or legal guardians after they were provided with detailed information about the study objectives, procedures, potential risks, and benefits. Parents were explicitly informed that their child's participation was voluntary and that they could withdraw consent at any stage without any negative consequences (Rizka & Jalal, 2024). During data collection, the researcher ensured that all observations were non-intrusive and conducted within normal classroom routines to minimize potential psychological or emotional discomfort for children. No direct questioning of children was conducted, and all data were generated through observation, teacher interviews, and document review. To protect confidentiality, pseudonyms were applied throughout the manuscript, and no photographs, video recordings, or identifying personal information were collected or published. All collected data were securely stored and used solely for research purposes. Overall, all procedures adhered to established ethical guidelines for research involving young children in educational settings (Taherun et al., 2025).

Trustworthiness of the Study

Several strategies were applied to enhance the rigor and trustworthiness of the research. Credibility was ensured through prolonged engagement in the field, triangulation of data sources (observations, interviews, and documents), and member checking with the teacher to confirm interpretations. Dependability was strengthened through systematic documentation of analytic decisions and the use of clear coding procedures (Mirja Kongas, 2023). Confirmability was maintained by keeping reflexive notes and an audit trail to minimize researcher bias. Transferability was supported by providing a rich description of the research context, participants, and learning environment, enabling readers to judge the relevance of the findings to other early childhood settings (Zosh et al., 2017). These strategies are consistent with approaches to ensuring rigor in recent qualitative studies on play-based learning and early childhood development (Chundung Gyang Pam, Jacinta M Adhiambo, 2020).

Results and Discussion

The analysis generated four overarching themes that describe how healthy lifestyle education was embedded within play-based learning activities. Each theme is presented together with illustrative evidence and interpreted in relation to relevant theoretical perspectives and previous research. A descriptive overview of the study context and participants is presented in Table 1 to support the interpretation of the qualitative findings.

Table 1. Study Context and Participant Characteristics

Variable	Description
Setting	One early childhood education center (pseudonymized), Central Java, Indonesia
Duration	Two-week data collection period
Participants	15 children (aged 3-4 years) and one classroom teacher
Learning approach	Play-based learning integrated with health-related routines
Parental involvement	Parents were encouraged to reinforce school-based messages at home

The two-week duration reflects an intensive observation period designed to capture naturally occurring play-based routines and recurring health-related behaviors within a bounded qualitative case, rather than to measure long-term behavioral change. This concentrated timeframe facilitated deep engagement with the participants, allowing for the identification of stable behavioral patterns and social dynamics through persistent daily observation. By focusing on the density of data within these established routines, the study prioritized achieving thematic saturation over longitudinal breadth, thereby ensuring a nuanced understanding of the immediate contextual factors that shape children's actions within their natural educational setting.

A thematic summary of the qualitative findings, together with illustrative excerpts from the data, is presented in Table 2.

Table 2. Summary of Emergent Themes and Illustrative Evidence

Theme	Description	Illustrative Evidence
Children learn healthy habits naturally through play	Children rehearsed health-related routines during joyful role-play and guided play-based activities.	"During role-play, the children pretended to buy vegetables and reminded each other to wash hands before eating."
Increased awareness of hygiene and healthy eating	Most children showed greater consistency in hand-washing and awareness of healthier snack	"Wash hands first before snack time."
Teacher creativity shapes the quality of learning	Storytelling, songs, and pretend-play were intentionally used to embed health concepts into meaningful learning.	"What should the rabbit do before eating carrots?"
Parental involvement reinforces school-based learning	Health messages introduced at school began to be transferred and practiced at home.	A parent reported that their child reminded them, "Don't forget to wash hands before eating."

Theme 1. Children Learn Healthy Habits Naturally Through Play: Children actively participated in a variety of play-based activities, including role-play in a "healthy mini-market," hand-washing games, movement songs, and guided pretend-play scenarios. During these activities, children were observed rehearsing health-related routines as part of their play interactions. Several children reminded peers to wash their hands before eating during role-play and snack-time routines. Health-related actions emerged naturally during play without direct instruction or corrective prompts from the teacher.

Theme 2. Increased Awareness of Hygiene and Healthy Eating: Across the two-week observation period, twelve out of fifteen children demonstrated increased consistency in hand-washing routines and greater awareness of healthy food choices. Children verbally expressed reminders such as "wash hands first before eating" during daily routines. During snack time and pretend-play activities, children showed the ability to differentiate between foods they identified as "healthy" and those considered "sometimes foods," based on classroom observations and teacher documentation.

Theme 3. Teacher Creativity Shapes the Quality of Learning: The classroom teacher consistently integrated health messages into storytelling, songs, and imaginative play activities. During circle-time sessions, the teacher used prompts and guiding questions to encourage children to reflect on health-related actions within stories and play scenarios. Health concepts were embedded across daily routines through creative instructional strategies rather than delivered as isolated lessons.

Theme 4. Parental Involvement Reinforces School-Based Learning: Parents reported that children transferred health-related behaviors from school to home settings. Several parents described instances in which children reminded family members to wash their hands before meals or expressed preferences for healthier food choices. These reports indicate continuity of health-related routines beyond the classroom environment during the study period.

Overall, the results indicate that healthy lifestyle education was embedded within daily play-based learning activities through child participation, teacher facilitation, and parental reinforcement. The observed behaviors reflect early patterns of routine formation rather than long-term behavioral outcomes, consistent with the short duration of the study.

Discussion

This study explored how healthy lifestyle education was implemented through play-based learning among children aged 3-4 years in an Indonesian early childhood education setting. The findings, structured into four themes, suggest that play-based pedagogy enables young children to enact and stabilize health-related routines (e.g., hand-washing, healthier food choices, and movement participation) through joyful participation,

peer interaction, and teacher scaffolding. Importantly, the observed changes during the two-week period should be interpreted as early indicators of habit formation rather than long-term behavioral outcomes, yet they provide meaningful insight into how health messages are translated into everyday practice within developmentally appropriate learning environments.

The observation that children learned and practiced healthy habits naturally through play aligns with extensive evidence highlighting play as the primary mode of learning in early childhood (Senol, 2023). In this study, children engaged in role-play activities such as a "healthy mini-market," hand-washing games, and movement songs, during which they reminded peers to wash hands and selected healthy foods during pretend scenarios. These behaviors indicate that children were not merely following teacher instructions but were actively embedding health routines into their social interactions (Rizkasari & Aji, 2023).

Consistent with (Norén et al., 2022), play-based physical and role-play activities provided opportunities for children to rehearse health-related actions repeatedly in emotionally positive contexts. Similarly, (Senol, 2021) reported that when children engage in health-related routines through play, their participation becomes more voluntary and sustained. The present findings extend this literature by demonstrating that play supports not only behavioral practice but also social normalization of healthy routines, as children began to remind one another without adult prompting (Wahjusaputri et al., 2024).

From a theoretical perspective, these findings align with learning theories emphasizing observation, imitation, and reinforcement in socially meaningful situations (Weir et al., 2024). Developmentally appropriate practice further supports the notion that young children learn most effectively through embodied experience and active exploration rather than abstract verbal explanations (Mapoma & Dagada, 2025a). The present study reinforces these perspectives by illustrating how health behaviors became part of children's lived experiences through playful engagement rather than compliance-based instruction (Navidi, 2020).

The increased consistency of hand-washing routines and awareness of healthy food choices among twelve of the fifteen children highlights early habit formation during a sensitive developmental period. Children's verbal expressions, such as reminding peers to wash hands before eating and distinguishing between "healthy foods" and "sometimes foods," suggest the emergence of early self-regulation related to health behaviors.

These findings support the view that early childhood is a critical period for habit formation, during which children construct meaning primarily through embodied participation rather than abstract reasoning (Hadi Siswanto, 2022). Previous studies similarly emphasize that health education is more effective when integrated into authentic daily routines instead of delivered as isolated instructional units (Ramos-pla & Casol, 2025). The present study adds nuance to this understanding by indicating that repeated exposure to health-focused play may contribute to the early development of internal self-regulation, even among children as young as three years old.

Importantly, the findings suggest that cognitive understanding alone is insufficient for sustaining healthy behaviors. Children appeared to engage more deeply when learning experiences were emotionally positive, playful, and relational. This underscores the affective dimension of play as a central driver in the internalization of healthy behaviors, an aspect that has received comparatively less attention in the existing literature and warrants further exploration (Rizka & Jalal, 2024).

Teacher creativity emerged as a key factor influencing the effectiveness of health education within play-based learning. The teacher intentionally embedded health messages into storytelling, songs, and imaginative prompts, such as asking children what a story character should do before eating. These strategies encouraged children to transfer fictional learning into real-life routines (Q. Liu & Demetriou, 2025).

This finding aligns with prior research demonstrating that imaginative and responsive teaching practices enhance children's engagement, motivation, and sustained participation in learning activities (Elinda Rizkasari; Ifa Hanifa Rahman; Prima Trisna Aji, 2022). Similarly, (Rizka & Jalal, 2024) found that teachers who integrate pedagogical intentions into play-based narratives enable children to make meaningful connections between play and real-world behaviors.

From a sociocultural perspective, these practices position teachers as mediators who scaffold children's participation in culturally valued behaviors (Wimberly et al., 2024). In this study, the teacher's role extended beyond instruction to include the intentional design of playful environments that supported children's agency

and autonomy. This supports Chen's (2025) argument that play-based pedagogy represents not only an instructional strategy but also an ethical commitment to honoring children's developmental needs and rights to joyful learning (Chen, 2025).

Parental involvement played an important role in reinforcing school-based health learning. Parents reported that children reminded family members to wash hands and expressed preferences for healthier food choices at home. These observations indicate that health messages introduced at school were transferred across settings, strengthening behavioral consistency (Ana & Eva, 2025).

This finding is consistent with ecological theories of child development, which emphasize the interconnectedness of home and school environments in shaping children's learning experiences (Zhou, 2024). Previous research has highlighted the importance of school-home partnerships in early childhood health promotion, demonstrating that consistent cues across contexts increase the likelihood of sustained behavior change.

However, the findings also suggest that not all families may have equal opportunities or resources to reinforce healthy routines. This underscores the need for context-sensitive collaboration with families to avoid unintentionally reproducing health inequities in early education settings (Desiree N Florida, 2025). Early childhood educators should therefore consider flexible and inclusive strategies to engage families from diverse socio-economic backgrounds.

Taken together, the four themes illustrate that play-based learning provides a powerful context for the internalization of healthy lifestyle habits, not simply because children learn about health, but because they enact and emotionally experience healthy routines within meaningful social relationships. Health-habit formation in this study appears to be mediated by three interrelated elements: playful participation, intentional teacher guidance, and consistent reinforcement across home and school contexts (Hadi Siswanto, 2022).

These findings extend existing literature by clarifying how and why play supports health-habit formation among very young children, particularly within Indonesian early childhood education settings where empirical research remains limited. More broadly, this study highlights the potential of health-oriented play-based pedagogy as a developmentally appropriate, socially grounded, and culturally responsive approach to early childhood health education (Q. Liu & Demetriou, 2025).

Conclusion

This study demonstrates that play-based learning provides a powerful and developmentally appropriate context for the internalization of healthy lifestyle habits among children aged 3-4 years. In line with the study's objective of exploring how healthy lifestyle education is implemented through play-based learning, the findings demonstrate that when health concepts such as hand-washing, healthy eating, and physical movement are embedded in joyful and meaningful play activities, children do not simply learn about health; they enact and emotionally experience healthy routines as part of their everyday lives. Teacher creativity, sensitive guidance, and school-home continuity were found to be key elements that supported children's emerging health behaviors.

The findings underscore the importance of embedding health content into daily early learning routines rather than treating it as a separate instructional subject. Early childhood educators should be supported to design playful, relational, and culturally responsive learning environments that integrate health-promoting behaviors naturally into classroom life. Strengthening collaboration between teachers and parents is essential to ensure that messages introduced at school are reinforced at home, thereby increasing the likelihood that health habits become sustained over time.

The findings of this study are bounded by the single-site case design, small participant group, and relatively short two-week observation period. As such, the results should not be generalized statistically but rather understood as context-specific insights. Future research may employ multi-site or longitudinal designs to examine the durability of health-habit internalization over time and across diverse socio-cultural contexts. Studies that explore children's own voices and perspectives more deeply would also enrich current understandings of how play shapes emerging health identities in early childhood.

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