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Research Article

Knowledge of Nurses about Communication Milestones at the Princess Marie Louise Children's Hospital; A Qualitative Study

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Abstract

Background: Communication milestones are critical indicators of children's developmental health and predictors of future academic and social outcomes. As frontline healthcare providers, nurses play a vital role in monitoring these milestones routinely. However, research suggests this surveillance role is often inadequately fulfilled, particularly regarding the identification of communication disorders in children aged 0-5 years.

Aim: This study aimed to assess nurses' knowledge of communication milestones in children aged 0–5 years, examine their current practices regarding milestone surveillance, and identify training needs to enhance their capacity in monitoring communication development.

Method: This descriptive qualitative study was conducted from May to June 2020 at Princess Marie Louise Children's Hospital in Accra, Ghana. Twenty-six nurses (16 for questionnaires, 10 for interviews) with experience ranging from less than one year to 20 years participated in the study. Data collection included semi-structured questionnaires and in-depth interviews. The questionnaire assessed nurses' knowledge of communication milestones and clinical practices, while audio-recorded interviews explored their experiences, perceptions, and training needs. Data were analyzed using descriptive statistics for quantitative components and inductive thematic analysis for qualitative data.

Results: While 68.75% of nurses reported being able to identify changes in children's language development, most lacked detailed knowledge regarding specific communication milestones. The majority correctly identified some key milestones (75% for babbling before 6 months; 62.5% for first words between 6-12 months), but demonstrated inconsistent knowledge regarding expressive speech development. Key findings from the qualitative analysis revealed limited formal education on communication milestones, with participants noting it was insufficiently covered in their training curriculum. There was a complete absence of continuing professional development in this area, with just one participant reporting self-directed learning. While nurses demonstrated theoretical understanding of identifying communication difficulties, its application in clinical practice was inconsistent. Missed opportunities in identifying communication disorders were frequently attributed to workload constraints, time limitations, and inadequate clinical exposure. Parental education on communication milestones was minimal to non-existent due to both knowledge limitations and workplace pressures. Notably, all participants expressed a strong interest in further training, recognizing its value for improving early detection capabilities and enhancing parent education.

Conclusion: This study demonstrates significant gaps between perceived and actual knowledge of communication milestones among nurses in Ghana, with implications for early identification of developmental delays. Findings suggest the need for curriculum enhancement, implementation of standardized screening protocols, and targeted professional development programs. A collaborative approach involving speech-language therapists could strengthen both educational practices and clinical surveillance, ultimately improving developmental outcomes for children in Ghana and similar resource-limited settings.

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Introduction

Communication is a fundamental human right [1]. It is basic to an individual's functioning and development. Article 19 of the Universal Declaration of Human Rights affirms that "Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media regardless of frontiers" [2]. Communication includes the exchange of thoughts, ideas, or information through speech, writing, or signing, using a mutually accepted medium between sender and receiver [3].

Communication develops sequentially during early childhood, as documented by the National Institute on Deafness and Other Communication Disorders. The journey begins during the first three months when infants demonstrate awareness through reactions to loud sounds, calming responses to familiar voices, and the production of pleasure sounds and differentiated cries for varying needs. This foundation expands between four and six months as infants begin tracking sounds visually, responding to voice tone variations, and experimenting with consonant-laden babbling. The progression continues into the latter half of the first year, marked by the crucial emergence of intentional communication through gestures, responsive listening, basic word comprehension, and potentially first recognizable words. The second year brings significant advancement as toddlers follow simple instructions, identify body parts when asked, combine words into rudimentary phrases, and steadily build vocabulary. By years two to three, children typically possess words for most familiar objects, construct short phrases, employ a wider range of consonant sounds, and achieve intelligibility with familiar listeners. The developmental trajectory culminates during ages three to five with increasingly sophisticated linguistic capabilities: answering complex questions, recounting experiences, constructing complex sentences, maintaining coherent narratives, and communicating effectively with both peers and adults, refining pronunciation, and acquiring pre-literacy skills like letter recognition and phonological awareness [4]. These sequential milestones serve as critical reference points for healthcare professionals monitoring developmental progress. Acquiring language is a major developmental feat achieved during the first years of life, unfolding alongside motor milestones such as walking and social exploration [5]. It is essential to establish normative timelines for these milestones in both typical and clinical populations, as it guides intervention planning and the early detection of co-occurring conditions [6].

In primary care settings, childhood speech and language concerns are commonly encountered. Family caregivers' observations, milestone assessments, and validated, parent-reported screening tools are integral to identifying speech and language delays, particularly after 24 months, when vocabulary under 50 words or unintelligible speech may indicate developmental risk [7]. The American Academy of Pediatrics recommends continuous developmental surveillance at every well-child visit, with standardized screening tests administered at 9, 18, and 30 months to facilitate timely referral and intervention [8]. Language development not only reflects a child's current abilities but also predicts long-term academic and social outcomes, making its monitoring a shared responsibility of healthcare professionals and caregivers [4].

Any difficulty in communication is likely to have a significant impact on a child's social behaviour and academic skills. Research has demonstrated that among various developmental delays in children, deficits in personal or social interaction are the most common [9,10]. It is important for professionals working with young children to have the ability to identify children who are at risk for communication disorders as early as possible. Early identification of communication disorders during the first 5 years of a child's life can lead to early intervention and prevention of negative impacts on the child's communication development.

Nurses play a critical role in this identification process, particularly in the Ghanaian healthcare context. They often serve as frontline information providers, advisors, and health state assessors in specialized children's hospitals and pediatric units where parents and caregivers frequently visit. Therefore, nurses' knowledge of communication developmental milestones, comparable to their familiarity with motor and physical growth parameters, is essential for identifying delays or deviations and facilitating timely referrals for intervention.

However, there is limited awareness and knowledge of communication development milestones among healthcare professionals in Ghana, especially nurses who serve as the first point of contact in healthcare facilities. This knowledge gap has contributed significantly to delayed referrals of children to speech and language therapy clinics, resulting in long-term consequences for affected children. Children with developmental difficulties such as speech and language disorders face a higher risk of reading disability [11]. Despite these global recommendations, studies in Ghana have identified significant gaps in nurses' training and practices around communication monitoring and referral [12]. Moreover, the World Health Organization has noted that gross motor development often receives more attention than functional domains like language and communication, leading to missed opportunities for early detection [13].

This study therefore aims to determine the depth of knowledge among nurses regarding communication milestones in children aged 0-5 years, with the ultimate goal of improving monitoring practices and early intervention outcomes in the Ghanaian healthcare system.

Methodology

Study design

This study was a descriptive qualitative study which took place from May 2020 to June 2020. Qualitative research collects participants' experiences, perceptions, and behaviors. It answers the questions of how and why instead of how many or how much. It can be structured as an independent study based entirely on qualitative data, or it can be part of a mixed method research combining qualitative and quantitative data [14].

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Study site

This study was conducted at the Princess Marie Louise Children's Hospital (PML) in Accra, Ghana. Princess Marie Louise Children's Hospital (PML) is a 74-bed government healthcare facility located in Accra, the capital city of Ghana. It is one of the largest providers of specialist paediatric care, providing both primary and secondary care. The facility provides services to the inner-city populace along the coast of the southern border of the country and the rest of Accra populace, providing primary care and specialized services in paediatrics. This site was chosen because it is a major children's hospital in Accra which provides general and specialist care to about 5,000 children between the ages of 0-17 years annually.

Study participants

The data analysis was made based on answers given on the questionnaires and the information collated during the interviews. The participants enlisted for this study were nurses who give care to patients at the Princess Marie Louise Children's Hospital. The fact that the study site is primarily a children's hospital makes it necessary to assess the knowledge of nurses on the communication milestones in young children.

Participants and sampling

All 76 permanent nurses at Princess Marie Louise Children's Hospital were invited to complete the questionnaire, and 16 nurses (21%) returned completed responses. Separately, a distinct group of ten nurses was recruited for in-depth, semi-structured interviews through convenience sampling of nurses available and willing to participate across different shifts. There was no overlap between the questionnaire respondents and the interviewees. The combination of broader descriptive data from the 16 questionnaires and richer qualitative insights from the ten interviews allowed the study to achieve both breadth and depth. Data saturation was achieved as additional interviews reinforced points raised by earlier participants and no new information was being added to the study.

Inclusion and Exclusion criteria

Inclusion criteria: General, enrolled and community health nurses who were permanent staff of the hospital during the time of the study.

Exclusion criteria: Student nurses on clinical practicum and nurses on rotation were exempted from the study.

Data collection

The data was gathered using a semi-structured questionnaire and individual interviews. The questionnaire was adapted from Pizolato, et al. [15], was designed to assess nurses' knowledge, clinical practices, and training requirements regarding communication disorders in children aged 0–24 months. The questionnaire was composed of 18 items, grouped into three thematic sections. The first section gathered demographic information and background data, including years of professional experience. The second section focused on knowledge of communication milestones and language development in infants and toddlers, comprising multiple-choice and open-ended questions on key developmental indicators such as the age for first smile, babbling, first words, and the expected vocabulary at 18 months. It also assessed understanding of the link between communication and factors like hearing health, syndromes, and prematurity. The third section explored nurses' practices and clinical behaviors such as observing communicative behaviors during routine care, referring suspected cases, and advising parents, as well as their perceived training needs and interest in further education on the topic. The questionnaire included a mix of formats (yes/no, multiple-choice, and open-ended) allowed for both quantitative analysis and diverse qualitative insights. The tool was administered in printed form and completed by nurses independently during their shifts. This instrument was distributed across all shifts to the 76 permanent nurses at PML, of whom 16 returned completed questionnaires. Separately, ten different nurses took part in audio-recorded, semi-structured interviews lasting between five and eleven minutes. Interviews were conducted in private staff areas to ensure confidentiality and followed a standard guide (Table 1) to explore participants' experiences, practices, and training preferences in depth. All recordings were transcribed verbatim in Microsoft Word and de-identified prior to thematic analysis.

Data management plan and quality control

Participants were assigned unique identification codes for anonymity during data collection. These numbers were used in data collection and collation. All information obtained from participants was used solely for the purposes of this study. Only the researcher and supervisor(s) had access to research materials. Confidentiality of the information provided by participants was safeguarded. The participants were given codes A1 to A10 to represent those who were interviewed and B1 to B16 for those who filled the questionnaire. Their anonymity was secured during collection and storage.

Data analysis

Data from semi-structured interviews were analyzed through an inductive thematic analysis approach [16,17]. The analysis was supported by *Atlas.ti* version 8, a qualitative data management software that facilitated systematic coding, organization, and retrieval of text segments. The use of *Atlas.ti* enabled the researchers to track codes across transcripts efficiently, compare emerging patterns, and maintain a clear audit trail throughout the analytic process.

Table 1: Sample Questions for Semi-Structured Interviews.

No.	Interview Question
1	What did you learn about communication milestones?
2	Have you had any CPD training on communication milestones?
3	How best can you identify a child's communication difficulties?
4	Have you ever identified a child with communication difficulties?
5	Do you educate parents about the communication milestones?
6	Would you require further training on communication milestones?

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The process began with open coding, where two researchers independently reviewed each transcript line-by-line to identify key ideas and assign initial codes. These codes were generated without pre-existing categories, allowing themes to emerge directly from the data. The researchers then engaged in axial coding by grouping similar codes into broader categories based on conceptual similarity and recurring patterns. Through iterative discussions, selective coding was carried out, during which central themes were refined, named, and defined in relation to the research objectives. Coding decisions were reviewed collaboratively to ensure thematic consistency and coherence. Discrepancies in interpretation were resolved through consensus to enhance the credibility of the findings. The final themes were illustrated using direct quotations from participants, ensuring that the voices of the nurses were central to the narrative. These quotes were carefully selected to reflect the essence of each theme, thus strengthening the linkage between the data and the thematic outcomes.

Quantitative data from the questionnaire were analyzed using descriptive statistical methods, such as frequencies and percentages, to provide an overview of participants' general knowledge, awareness, and practices related to communication disorders in young children. The integration of both qualitative and quantitative findings allowed for a more comprehensive understanding of the phenomenon under investigation.

Ethical considerations

This study received approval from the Ethics and Protocol Review Committee of a university-based School of Biomedical and Allied Health Sciences (clearance number: SBAHS/AA/AA/SLT/10704001/2019-2020). Written informed consent was obtained from all participating nurses. The nature, aims, objectives, and significance of the research were clearly explained to participants prior to data collection. Permission was also obtained from the Nursing Administrator of the P.M.L. Children's Hospital, where the study was conducted. To ensure anonymity and confidentiality, no names, staff IDs, or any identifying personal information were recorded or linked to the responses. Each participant was assigned a unique code known only to the principal investigator. All data were stored securely and were accessible only to the research team. Given the small sample size (n = 10), additional precautions were implemented during the reporting phase to avoid including any potentially identifying contextual information. Participants were reassured that their responses would remain confidential and would only be used for academic purposes.

Results

Demographics of the study population

Within the period of this study, a total of 26 nurses with working experiences ranging from less than a year to 20 years participated. The study utilized both quantitative (n = 16) and qualitative (n = 10) methods. The demographic profile revealed a predominantly female representation (92.3%), with general nurses constituting the largest professional category (80.8%) (Table 2).

Recognition and assessment of communication disorders

The study revealed a notable contrast between nurses' ability to recognize language developmental changes and the use of formalized protocols. While 68.75% of respondents reported they could identify changes in children's language development, the same percentage (68.75%) reported no protocol was being used for diagnosis of communication disorders (Figure 1) (Table 3).

Awareness of early childhood language development milestones

Assessment of nurses' awareness of early childhood language development milestones revealed variable levels of knowledge. For the presentation of first social smile, 56.25% correctly identified this occurring before 3 months. Regarding babbling or prattling sounds, 75% identified this milestone as occurring before 6 months. For formation of first words, 62.5% correctly identified the 6-12 months period. For expressive speech at 18 months, responses were equally divided, with 43.75% reporting two-word sentences and another 43.75% reporting first words as the milestone at 18 months (Table 3, Figure 2).

Assessment of children with communication disorders

Nurses showed considerable awareness of factors associated with communication disorders. 87.5% recognized that a child's

Table 2: Demographic characteristics of Study Population (N = 26).

Demographics	Number	Percentage (%)
Sex		
Male	2	7.7
Female	24	92.3
Working Experience		
Less than a year	4	15.4
1 to 5 years	8	30.8
5 to 10 years	7	26.9
10 to 15 years	6	23.1
15 to 20 years	1	3.8
Categories of Nurses		
Critical care	1	3.8
Enrolled	1	3.8
Community health	3	11.6
General	21	80.8

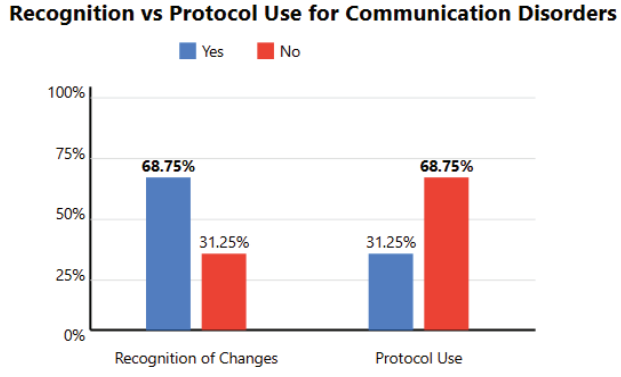

Figure 1: Nurses' Recognition and Use of Protocols for Identifying Communication Disorders (N = 16).

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Table 3: Awareness of Early Childhood Language Development Milestones (N = 16).

Variables	Number	Percentage (%)
Presentation of Social Smile		
Before 3 months	9	56.25
3 months	5	31.25
After 3 months	2	12.5
Babbling/Prattling		
Less than 6 months	12	75
6 months	4	25
Formation of first words		
Before 6 months	2	12.5
6 to 12 months	10	62.5
12 to 24 months	4	25
Presentation of expressive speech at 18 months		
Forms two-word sentences	7	43.75
First words	7	43.75
Speaks about 30 single words	2	12.5

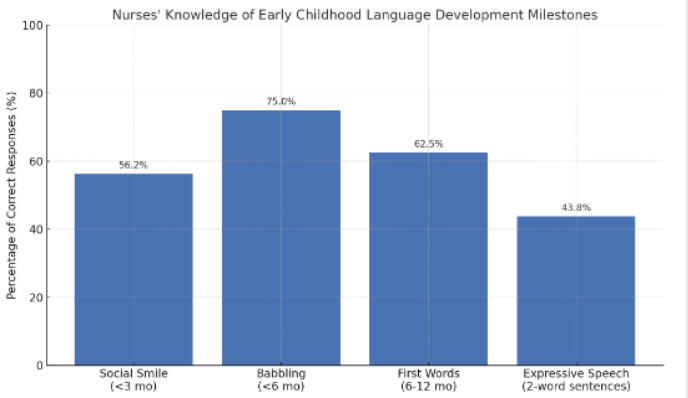

Figure 2: Nurses' Knowledge of Early Childhood Language Development Milestones (*N* = 16).

speech development is related to hearing health, 93.75% acknowledged the importance of speech stimulation, and 87.5% recognized that preterm and syndromic babies require early stimulation programs. Importantly, 75% of nurses agreed with all three factors (Figure 3).

Means of nurses' referral

When presented with an 18-month-old child who does not respond to simple commands, 68.75% (*n* = 11) of nurses indicated that they would recommend a hearing assessment for further evaluation. A smaller proportion, 18.75% (*n* = 4), reported that they would remain observant and advise the mother to monitor the child closely, while 12.5% (*n* = 2) stated they would reassess the child during a follow-up consultation.

Regarding language stimulation, 75% (*n* = 12) of the nurses stated that they consistently encourage parents to support their child's language development. Conversely, 25% (*n* = 4) mentioned that they only offer such guidance occasionally.

In instances where communication difficulties are suspected, 62.5% (*n* = 10) reported that they typically engage in discussions with their team members, whereas 37.5% (*n* = 6) acknowledged that such discussions occur only occasionally.

All participants (100%) expressed a strong interest in attending a training course focused on communication disorders in infants and toddlers, highlighting a recognized need for continued professional development in this area.

Qualitative findings

Table 4 shows a summary of themes and sub-themes which emerged from the analysis. The results are presented in six sections: themes generated on (1) Knowledge of communication milestones in children aged 0-5 years (2) Continuous professional development on communication milestones (3) Identification of children with communication difficulties (4) Missed Opportunities in Identifying Communication Disorders (5) Parental education on communication milestones and (6) Perceived training needs on communication milestones. In each section, the results are presented in order of dominating themes followed by minority themes. Conflicting viewpoints are presented directly from nurses' narratives. Quotations that clearly represent unique ideas are included. Nurses are identified by specific numbering codes A1 to A10 and B1 to B16.

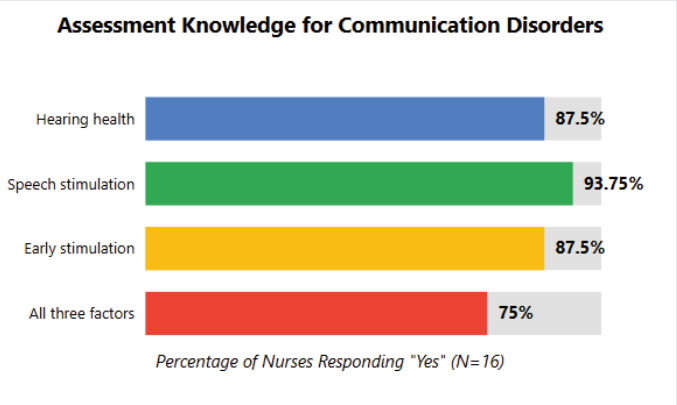

Figure 3: Assessment Knowledge for Communication Disorders (*N* = 16).

Table 4: Summary of themes and subthemes.

Themes	Sub-themes
Knowledge of communication milestones in children aged 0-5 years	Onset of sound production Onset of speech production Child being able to respond to sound Child being able to respond to gestures
Continuous professional development on communication milestones	Absence of formal CPD opportunities Reliance on self-directed learning
Identification of children with communication difficulties	Inability to hear Non-responsiveness to sound Non-responsiveness to gestures Absence of speech Difficulty speaking Non-responsiveness to simple commands
Missed Opportunities in Identifying Communication Disorders	Lack of attention to communication Inadequate clinical exposure Workload and time constraints
Parental education on communication milestones	Limited information to share with parents Minimal parental education Absence of parental education
Perceived training needs on communication milestones	Demand for curriculum inclusion Recognition of training benefits for early detection and parent education

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Knowledge of communication milestones

When questioned about their educational background regarding communication milestones, Nine out of ten participants initially showed surprise and hesitation. However, several demonstrated fair knowledge of the subject:

"*Yes, I've learnt something. When children grow from 0-11 months there are signs you see if a child is for example 1 month and the child cries, we can call that a milestone*" *(Nurse A1)*

"*That children should be able to make certain sounds or gestures at certain ages*" *(Nurse A6)*

"*Each stage in the life of a neonate or toddler comes with what the child can do or the communication skill the child can perform. It can be verbal or non-verbal but it first begins with the non-verbal*" *(Nurse A7)*

"*I know that at a point in their development they coo, blab and say some things. At about 3 -4 months they coo, 5-6months they blab, some of the children (female) say ma, da at about 9 months*" *(Nurse A9)*

Some participants indicated that while communication milestones were mentioned in their training, the coverage was insufficient:

"I remember it was mentioned when we did developmental milestones but they didn't zero in on communication milestones. I remember my teacher once said that at every stage of the child's growth you should expect certain things; they will crawl, sit at a point, between 10-12 months they'll repeat simple words like mama, dada" (Nurse A10)

"When doing general nursing, there's just a semester for paediatric nursing and we learn all about peadics in 3 months. So, I didn't exactly learn about the milestones" (Nurse A3)

Other participants reported that it was not part of their curriculum and that they had no training whatsoever on communication milestones.

"*During nursing school days, although it wasn't part of our curriculum but I came across it when reading my books*" *(Nurse A5)*

"*I have no formal knowledge of communication milestones but I know a bit from experience" (Nurse A8)*

Continuous Professional Development on Communication Milestones

All participants reported an absence of continuous professional development (CPD) training specifically focused on communication milestones:

"*No, I haven't*" *(Nurse A9)*

Only one participant described informal self-directed learning:

"*Not training per say. But I watched YouTube videos as they was a point that I was working with a private facility as the team lead for the nurses and some children came in and I felt they were too old not to be talking so I took it upon myself and watched a few videos to learn about communication and what to expect from children" (Nurse A10)*

Identification of Children with Communication Difficulties

Seven participants demonstrated adequate knowledge regarding the identification of communication difficulties in children:

"*As a nurse, if a child doesn't coo at 3-4 months and if you also snap your fingers close to the ears of the child and if the child doesn't turn the head towards the area of sound, there's a problem. Response to noises made close to the baby and no response from the child and this means there's a problem*" *(Nurse A9)*

"*Most of the time it could be your own intuition and sometimes I'll ask another person that don't you think this child isn't making audible noises or being too late to talk*" *(Nurse A10)*

"*Depending on the age of the child. A 3-year-old or below child is expected to talk or make sounds, or respond to simple commands, repeat certain actions portrayed to him/her, give feedback. If a child can't do these things then there's a problem*" *(Nurse A7)*

"*Child is unable to mention his/her name. Child not responding to their name. Child unable to mention simple words like mom or dad*" *(Nurse B7)*

"*Sometimes when you clap your hands, the child doesn't hear. The child does not respond when you call unless he/she can see you*" *(Nurse B2)*

Missed Opportunities in Identifying Communication Disorders

Notably, eight participants reported never having identified a child with communication difficulties. Their responses revealed a pattern of neglect regarding this aspect of child development:

"*No, because much attention is not paid to that and the issue props up once a while in our conversations. It doesn't come that often" (Nurse A7)*

"No, I haven't. I don't look out for these things and also the workload is too much and we are in a hurry to clear our patients" (Nurse A4)

"No. I haven't come across children with those disorders and perhaps it is because we don't pay attention to it and most of the times we are concerned with feeding and medication and we don't pay attention to it" (Nurse A9)

Some participants attributed this deficiency to limited clinical exposure to pediatric cases during their training:

"No, I haven't. When in nursing school, most of the clinicals were with adults and I didn't have ample time with children" (Nurse A3)

Parental education on communication milestones

Responses indicated that parental education regarding communication milestones was minimal to non-existent.

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Participants cited workplace constraints as a primary barrier:

"*There are no enough nurses and the pressure is on the nurses on duty. When the parent comes in with the child, we educate parents on feeding issues but no education on communication milestones. We tell mothers to be observant for changes in a child as he/she grows especially some sounds made within the age brackets. We weren't really thought, just a few highlights but as one works, one gets to know about these milestones…*" (Nurse A3)

"No, I don't. It something we should do but we don't do. One reason being that we are overwhelmed with work and as such they are the least things we think about" (Nurse A5)

Some participants acknowledged their own knowledge limitations as a barrier to parent education:

"*No, but in school we had seminars on autism and how to identify autistic children. We can't really educate them, because we don't have much information*" *(Nurse A4)*

A minority of participants reported providing limited education to parents:

"*We rather educate on developmental milestones using the maternal child health book but on communication milestones is not into details. We tell them that after a couple of months, a child should be able to make certain sounds based on their need e.g., when they need food (hungry)" (Nurse A1)*

"Yes. We give them a timeline for which the child has to respond, play on his/her own, or hear and if the child doesn't do these things there is a problem. It is important to educate the mother as this would let the mother monitor the child. The education is general and not into details as we don't have much information" (Nurse A2)

Perceived training needs on communication milestones

All the participants expressed a need for additional training on communication milestones, recognizing several potential benefits:

"Yes, it would enable both the nurses and the parents to detect the communication difficulties earlier. And as it isn't part of our curriculum in school, we don't see the importance of it; hence training would help to bridge that gap. I think it would help if we can modify our curriculum to include some of these things" (Nurse A5)

"*Yes. When we have more information on it, we can share with the parents*" *(Nurse A6)*

"Yes. It is very necessary. It allows us to identify children with communication problems as early as possible. As one can think that as the child develops it would come and you don't take any initiative; it ends up affecting the child later on and it would also help us build our skills in the communication milestones" (Nurse A7)

"Yes. It would help nurses a lot, even if not for themselves but for the benefit of the patients. It would help nurses who would engage the parents in discussions" (Nurse A9)

"Actually yes. Especially after this interview I realized my past experience happened about 2-3 years ago and I think I forgot about it. But thinking about it, there may be other cases where the child may have needed speech therapy but because me as the nurse didn't know much about communication milestones…" (Nurse A10).

Summary of key findings

During the study, 26 nurses with between under one year and up to 20 years of experience (most clustered in the 1–5-year range) participated, the vast majority being female (92.3%) and general nurses (80.8%). Despite this breadth of experience, only 68.8% felt confident recognizing deviations in children's language development—and equally, 68.8% reported that no formal protocol exists within their facility for diagnosing communication disorders.

Knowledge of early language milestones was moderate: just over half of respondents correctly placed the social smile before three months (56.3%), while 75% and 62.5% respectively identified babbling before six months and first words at 6–12 months. However, only 43.8% recognized two-word sentences as the typical expressive milestone at 18 months, indicating uneven retention of developmental timelines.

When it came to assessment and referral, Nurses exhibited strong theoretical awareness, with 87.5% linking speech development to hearing health, 93.8% acknowledged the role of speech stimulation, and 87.5% understood the need for early stimulation in preterm or syndromic infants, with 75% endorsing all three factors simultaneously. In practice, 68.8% would refer an unresponsive 18-month-old child for a hearing assessment, though nearly 20% preferred a "wait-and-see" approach and 12.5% planned to reassess later. While 75% consistently encouraged parents to support language development, only 62.5% regularly discussed suspected difficulties with colleagues. Notably, every participant expressed strong interest in formal training on communication disorders in infants and toddlers.

Qualitative interviews revealed that, although most nurses could describe key signs such as cooing and babbling, communication milestones received scant attention in both their initial training and ongoing professional development. Eight out of ten interviewees admitted they had never identified a child with communication difficulties—citing high workloads, insufficient pediatric exposure, and a general lack of focus on communication as key barriers. Parental education on these milestones was similarly sporadic and superficial. Across all discussions, nurses advocated for inclusion of communication milestones in nursing curricula and structured CPD programs, emphasizing that stronger training would enhance early detection, improve parental counselling, and ultimately lead to better outcomes for children with communication disorders.

Integration of quantitative and qualitative findings revealed important convergences and divergences. While questionnaire responses indicated moderate knowledge of basic milestones such as babbling (75% correct), the qualitative interviews revealed deeper uncertainties about appropriate developmental timelines. Similarly, while 75% of questionnaire respondents reported encouraging parents to support language development,

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interview data suggested this guidance was often superficial due to nurses' own knowledge limitations. This integration highlights the gap between theoretical awareness and practical application in clinical settings

Discussion

Speech and language disorders remain underemphasized in child development monitoring despite their critical importance to overall growth [13,18]. This lack of prioritization contributes to the under-identification of communication disorders in children, as early warning signs are frequently missed. Nurses, who have consistent contact with children from post-natal to early childhood stages, play a pivotal role in developmental surveillance. Understanding their knowledge of language development milestones is essential for improving early detection and intervention strategies.

Our findings revealed that while 68.75% of participants reported being able to recognize changes in children's language development, their actual knowledge of specific developmental milestones was inconsistent. Only 56.25% correctly identified the timeline for first social smile, 25% for babbling, 62.5% for first words, and merely 12.5% for expressive speech. This discrepancy highlights a significant knowledge gap between perceived and actual understanding of communication milestones. These findings align with the fundamental importance of communication development as highlighted by Gervain [5] and Onnivello, et al. [6]. As noted, acquiring language is a major developmental feat during the first years of life, and establishing normative timelines is essential for early detection of co-occurring conditions [5]. The knowledge gaps identified suggest that nurses may not be fully equipped to recognize these important developmental patterns, potentially compromising early detection goals emphasized in the literature.

Despite these knowledge deficits, participants demonstrated awareness of related factors in communication disorders, with 87.5% recognizing the relationship between speech delays and hearing health, 93.75% acknowledging the importance of speech stimulation, and 87.5% aware that preterm and syndromic babies require early stimulation programs. Most participants (68.75%) would appropriately suggest hearing assessment for an 18-month-old who does not respond to simple commands, and 62.5% would consult with the primary healthcare team upon suspecting communication disorders. The inconsistency in nurses' knowledge of specific milestones (with only 56.25% correctly identifying timeline for first social smile, 25% for babbling, etc.) contrasts sharply with the American Academy of Pediatrics' recommendations [8] for continuous developmental surveillance at 9, 18, and 30 months. This gap between recommended practice and actual knowledge raises concerns about the effectiveness of the developmental monitoring system in Ghana.

Participants identified three categories of communication milestones: onset of speech, sound production, and responses to sounds and gestures. However, they frequently lacked specific knowledge about appropriate developmental timelines. As one participant noted, "I have no formal knowledge of communication milestones but I know a bit from experience" (Nurse A8). All participants reported having no continuing professional development training in this area, confirming findings by Kemker, et al. [19] regarding the global lack of training for nurses in communication-related care.

For identification of communication disorders, participants primarily relied on observing the absence of expected milestones, particularly focusing on response to sounds/commands and speech production difficulties. However, the majority indicated they had never identified a child with communication difficulties, attributing this to insufficient attention to the issue, high workloads, and understaffing. The finding that most nurses reported never having identified a child with communication difficulties is particularly concerning given the established link between early communication disorders and later reading disabilities. The World Health Organization's observation that gross motor development often receives more attention than functional domains like language and communication appears to be reflected in our findings, where Child Welfare Clinics have been reduced to 'weighing clinics' that focus primarily on physical growth parameters [13].

Professional experience emerged as an important compensatory factor addressing formal training deficiencies. Participants reported acquiring knowledge through clinical observations and personal experiences with their own children or families with communication disorders: "As a nurse, if a child doesn't coo at 3-4 months and if you also snap your fingers close to the ears of the child and if the child doesn't turn the head towards the area of sound, there's a problem... I learnt some from school, as a mother and from people whose children have speech disorders; as such its combined" (Nurse A9).

Parental education about communication milestones was reported as minimal to non-existent, with participants citing their own knowledge limitations and high patient volumes as barriers: "We can't really educate them, because we don't have much information" (Nurse A4). This represents a critical missed opportunity for early detection, as parental awareness could significantly improve surveillance of developmental delays. The minimal to non-existent parental education reported by participants represents a missed opportunity for the 'shared responsibility' between healthcare professionals and caregivers emphasized by the National Institute on Deafness and Other Communication Disorders [4]. Our study suggests that the knowledge limitations of healthcare providers directly impact their ability to engage parents in this shared monitoring process, potentially delaying identification of children at risk.

The primary reasons identified for knowledge inadequacies included insufficient training, limited learning time, and absence of the subject in nursing curricula. Staff shortages and excessive workloads further compounded these issues, hindering both knowledge acquisition and parent education efforts. These systemic issues identified in our study, including

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inadequate training and excessive workloads, complement the findings of Appiah, et al. [12], who previously identified significant gaps in nurses' training and practices around communication monitoring and referral in Ghana. Our qualitative findings provide deeper insight into the specific nature of including the lack of continuing professional development opportunities focused on communication milestones.

All participants expressed interest in specialized training on communication milestones, recognizing its potential benefits for improving service quality and enabling earlier interventions. As one participant suggested, "I think it would help if we can modify our curriculum to include some of these things" (Nurse A5).

A significant contextual factor emerged in that Child Welfare Clinics have been reduced to focusing primarily on physical growth parameters ("weighing clinics"), neglecting comprehensive developmental assessments. This systemic issue further limits opportunities for communication disorder identification and appropriate referrals.

These findings align with Pizolato, et al. [15] who noted that many health professionals lack in-depth knowledge of communication milestones. Our study underscores the urgent need for enhanced training on normal language development patterns to improve monitoring and early detection capabilities among nurses and primary healthcare teams.

Figures 4 and 5 gives linkages to these effects.

Practical and scientific contributions

Our study makes several significant contributions to clinical practice, education, and health policy in Ghana. This study provides empirical evidence of specific knowledge gaps among nurses regarding communication milestones in children aged 0–5 years, highlighting concerns raised by the World Health Organization [13] about the disproportionate emphasis on gross motor development over functional domains such as communication. Through identifying structural barriers within the Ghanaian healthcare system that hinder effective developmental surveillance, our research builds upon previous work by Appiah, et al. [12] on gaps in nurses' practices around communication monitoring and referral. Our findings establish a framework for strengthening the nursing education curriculum in Ghana to address the communication milestone knowledge gaps, which addresses concerns raised by Onnivello, et al. [6] about establishing normative timelines for developmental milestones to guide intervention planning and early detection. Furthermore, the identified gap in parental education creates an opportunity to develop structured parent education protocols that support the collaborative monitoring approach recommended by the National Institute on Deafness and Other Communication Disorders [4]. Documenting current referral practices and their limitations contributes to the development of more effective early intervention pathways, aligning with the American Academy of Pediatrics' recommendations for timely referral and intervention [8].

Conclusion

This study has revealed significant gaps in nurses' knowledge regarding communication milestones in children aged 0-5 years in Ghana. The discrepancy between nurses' perceived ability to recognize developmental changes and their actual knowledge of specific milestones underscores the need for enhanced training and curriculum development. These findings are particularly concerning given the established importance of early identification and intervention for communication disorders. The knowledge gaps identified highlight broader systemic issues such as inadequate training, heavy workloads, and the reduced scope of Child Welfare

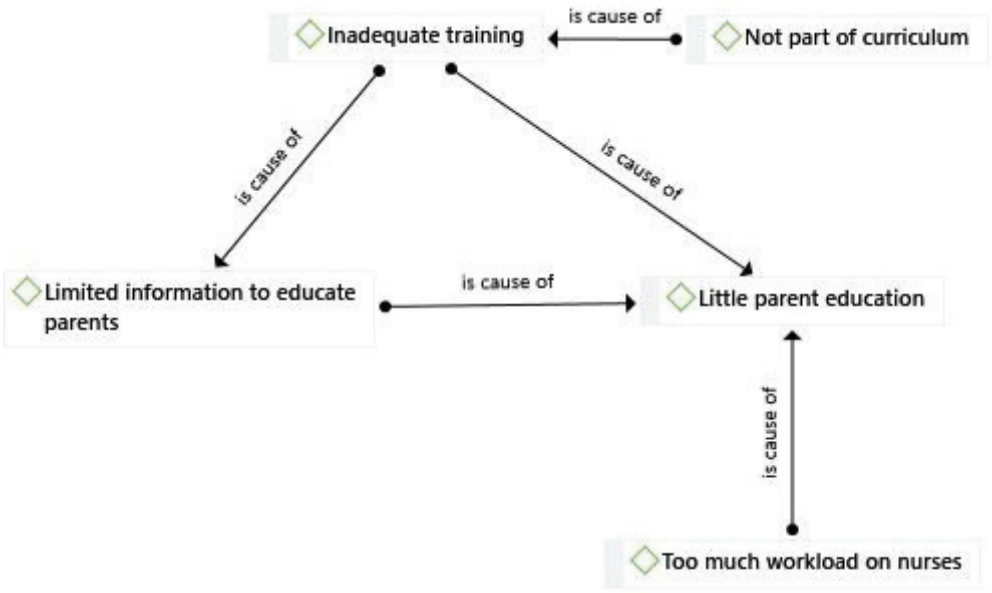

Figure 4: Factors Contributing to Limited Parent Education on Communication Milestones. Source: Author's construct from in-depth interview.

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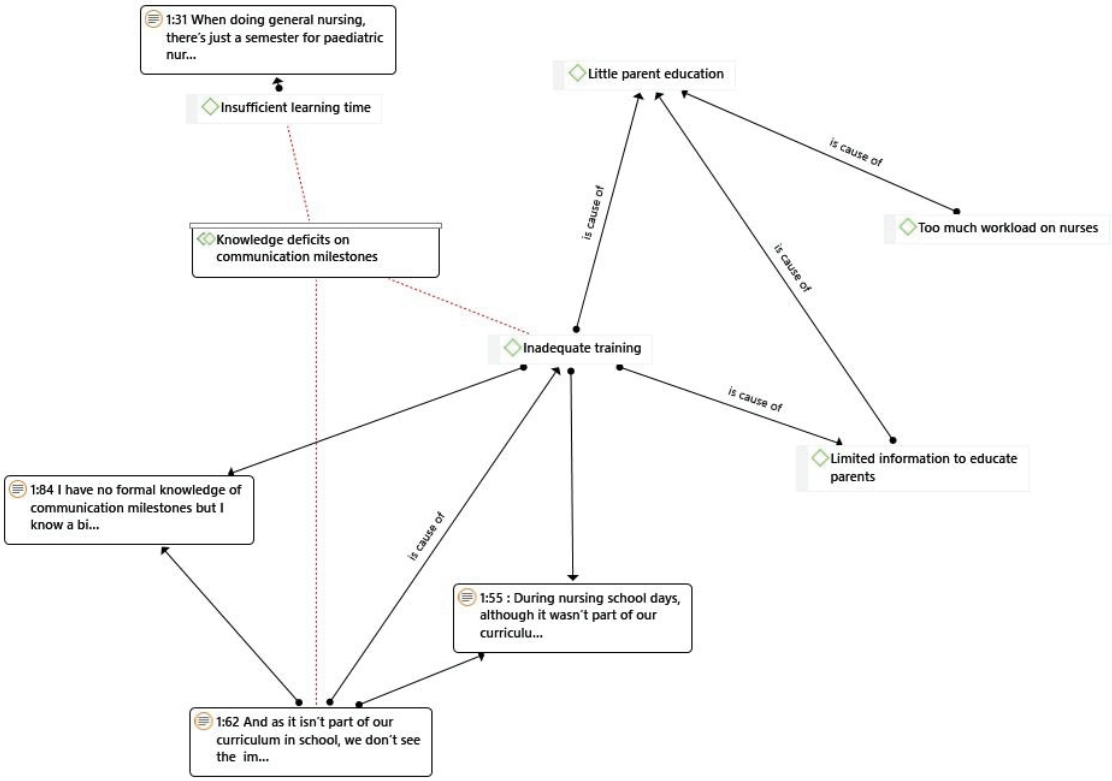

Figure 5: Reasons for knowledge deficiencies. Source: Author's construct from in-depth interview.

Clinics. Addressing these challenges requires a multi-faceted approach involving curriculum enhancement, professional development, and policy reform. Implementing the outlined recommendations will help Ghana establish continuous developmental surveillance, as recommended by the American Academy of Pediatrics, and ensure that communication development receives appropriate attention in pediatric care. This would meaningfully enhance outcomes related to early identification and timely intervention for children with communication disorders, with lasting benefits for their academic achievement and social integration.

Recommendations

Based on our findings and the literature on pediatric communication health, we recommend comprehensive improvements across multiple domains. For curriculum development, integrating detailed communication development milestone content into pre-service nursing education curricula is essential, emphasizing the sequential developmental patterns documented by the National Institute on Deafness and Other Communication Disorders. Additionally, developing continuing professional development modules that address the specific knowledge gaps identified in this study should focus on milestone recognition and appropriate referral pathways. In clinical practice, implementing standardized screening tools for communication development in Child Welfare Clinics, aligned with the American Academy of Pediatrics' recommendations for developmental surveillance, would significantly improve early detection. The development of structured parent education protocols would enable nurses to effectively engage parents in shared responsibility of developmental monitoring, as emphasized by current literature. From a healthcare policy perspective, addressing the systemic issues identified in this study, including staffing shortages and excessive workloads that hinder comprehensive developmental assessments, is crucial. Establishing national guidelines for developmental surveillance that appropriately emphasize communication milestones would address the WHO's concern about the disproportionate focus on gross motor development. Finally, establishing structured collaboration between nurses and speech-language therapists would improve early identification and referral of children with communication disorders, while the creation of interdisciplinary teams within healthcare facilities would ensure comprehensive developmental monitoring, supporting the early detection of co-occurring conditions.

Limitations of study

Recruiting participants posed challenges due to skepticism, limited participant knowledge regarding communication milestones, and fear of victimization. Shift systems and heavy workloads restricted interview durations. Additionally, some participants found the questions overly technical. The COVID-19 pandemic led to approval delays, reduced participant recruitment, and forced adaptations in data collection methods. Additionally, limited existing literature on this topic posed difficulties in acquiring sufficient background information. Despite these challenges, the study's validity and quality remained unaffected.

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Author contributions

Rebecca Boison: conceptualization, resource, validation, and writing – original draft. Jaiyeola Kofi Bohli: visualization, investigation, writing – original draft, Formal analysis. Nana Akua Victoria Owusu: conceptualization, validation, methodology, writing – review and editing. Kenneth Ablordey: Formal analysis, writing – original draft, investigation. Josephine Ohenewa Bampoe: conceptualization, methodology, supervision, writing – review and editing.

Data availability statement

The data supporting this study are available upon reasonable request, subject to ethical and privacy restrictions.

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