

Original Research Article

Factors Influencing the Skill Level of Primary Healthcare Workers in Managing Paediatric Emergencies

ABSTRACT

Background

Paediatric emergencies continue to be a significant public health concern in Nigeria, particularly in rural areas where primary healthcare centers (PHCs) often serve as the sole source of medical care. The ability of healthcare workers in these settings to effectively manage paediatric emergencies is crucial for improving child health outcomes. This study aimed to assess the factors influencing the skill level of primary healthcare workers in managing paediatric emergencies in Zaria, Nigeria.

Methodology

A cross-sectional descriptive study was conducted among 139 randomly selected healthcare workers in Sabon Gari and Zaria Local Government Areas. A pre-tested questionnaire was used to collect data on socio-demographic characteristics, work experience, and skills in managing paediatric emergencies. Data were analyzed using SPSS version 21.

Results

The results revealed that healthcare workers in PHCs in Zaria exhibited varying levels of skills in managing paediatric emergencies. Several factors were identified as influencing their skill levels. Healthcare workers with higher academic qualifications demonstrated significantly better skills in managing paediatric emergencies. This suggests that formal education plays a crucial role in developing the necessary competencies. While experience can be a valuable asset, the study did not find a strong association between years of experience and skill levels. This may indicate that experience alone is not sufficient for developing the necessary skills, and additional training and support may be required. Healthcare workers who had received recent training or participated in continuing medical education (CME) programs related to paediatric emergency management tended to have higher skill levels. This highlights the importance of ongoing professional development in maintaining and improving skills.

Discussion

The findings of this study suggest that a combination of factors influences the skill level of primary healthcare workers in managing paediatric emergencies. While academic qualifications are important, ongoing training and access to resources are also essential. It is crucial to address these factors through targeted interventions to improve the skills of healthcare workers and enhance the quality of care provided to children in need.

Conclusion

This study highlights the critical need for targeted interventions to improve the skills of primary healthcare workers in managing paediatric emergencies in Zaria, Nigeria. By addressing factors such as academic qualifications, training, resource availability, and work environment, policymakers and healthcare providers can significantly enhance the quality of care provided to children in need.

Keywords: Paediatric emergencies, Nigeria, Primary healthcare, Healthcare workers, Health policy, Healthcare systems, Healthcare delivery, Health interventions, Health promotion, Health education

1. INTRODUCTION

A medical emergency is defined as an acute illness or injury that poses an immediate threat to an individual's life or long-term health if not addressed swiftly (Ramanayake, Ranasingha, and Lakmini, 2014). When such emergencies involve children under the age of 18, they are classified as paediatric emergencies (Newgard, 2021). These emergencies remain a significant cause of morbidity and mortality, especially among children under the age of five, particularly in low- and middle-income countries (LMICs) where healthcare systems are often overstretched and under-resourced (UNICEF, 2020; Schmid and Raju, 2021; WHO, 2023).

Paediatric emergencies encompass a wide range of acute conditions, including respiratory tract infections, diarrheal diseases, infectious diseases, severe malaria, and severe acute malnutrition. These conditions are prevalent across regions with similar socio-demographic characteristics, particularly in Sub-Saharan Africa and South Asia. For example, a study conducted in Sudan, identified respiratory tract infections as the most common paediatric emergency, followed by diarrheal disorders and severe malaria (Ahmed et al., 2022). Another study conducted in Ethiopia found that respiratory tract infections, diarrheal diseases, and malaria were the most common paediatric emergencies (Ambaye & Tefera, 2016). Similarly, a study in Pakistan identified respiratory tract infections, pneumonia, and diarrhea as leading causes of paediatric emergencies (Atiq et al., 2015). Similar patterns have been observed in Southwestern Nigeria, where a four-year review of paediatric admissions at the Ekiti State University Teaching Hospital (EKSUTH), Ado-Ekiti, revealed that febrile convulsions, severe malaria, acute pneumonia, diarrhoeal diseases, and sickle cell anaemia were the leading causes of emergency presentations (Agbesanwa et al., 2023).

Undernutrition is a critical underlying factor that exacerbates the severity of paediatric emergencies. It significantly increases the risk of mortality from common childhood illnesses, such as diarrhea, pneumonia, and malaria. The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) have reported that over 50% of all childhood deaths are attributable to undernutrition, with mortality risks rising sharply with the severity of malnutrition (UNICEF, 2023; WHO, 2024). Despite global efforts to reduce child mortality through initiatives like the Millennium Development Goals (MDGs), significant disparities persist, particularly in rural and underserved areas where healthcare resources are scarce (UNICEF, 2016; UNICEF, 2020).

In Nigeria, the situation is particularly concerning. The country continues to grapple with high rates of child mortality, with preventable and treatable conditions such as pneumonia, malaria, and diarrheal diseases accounting for a significant proportion of deaths among children under

five. Nigeria's under-five mortality rate (107.2 deaths per 1,000 live births) remains one of the highest globally (UNICEF, 2024), despite various initiatives aimed at improving healthcare access and quality (Fagbamigbe et al., 2020; Idris & Shingw, 2024).

Primary healthcare centers (PHCs) are often the first point of contact for children with medical emergencies in Nigeria, especially in rural areas where access to secondary and tertiary care is limited. PHCs are intended to provide essential health services, including the diagnosis and treatment of common paediatric emergencies. However, the effectiveness of these centers is frequently hampered by various challenges, including inadequate infrastructure, insufficient medical supplies, and a lack of adequately trained healthcare workers (Ekenna et al., 2020; Abah, 2022; Obubu et al., 2023)

A critical factor influencing the management of paediatric emergencies at PHCs is the knowledge level of the healthcare workers. Knowledge refers to the information and understanding that healthcare workers possess about various medical conditions, diagnostic procedures, and treatment protocols. Inadequate knowledge can lead to misdiagnosis, delayed treatment, and poor patient outcomes. Studies have shown that many healthcare workers at PHCs in Nigeria lack the necessary knowledge to effectively manage common paediatric emergencies, which significantly contributes to the high rates of child mortality in these settings (Eze et al., 2023; Suberu, Obohwemu & Soyobi, 2024).

Given the pivotal role that PHCs play in providing healthcare to children in Nigeria, it is essential to assess and improve the knowledge base of healthcare workers in these centers. This study aims to evaluate the knowledge of healthcare workers in PHCs in Zaria, Nigeria, regarding the management of common paediatric emergencies. By identifying knowledge gaps, this research can inform targeted interventions to enhance the quality of care provided to children and ultimately reduce paediatric morbidity and mortality in the region.

2. METHODOLOGY

2.1 Study Setting

Zaria, a diverse Nigerian city, has 55 primary healthcare centers (PHCs) serving a population of approximately 698,348. These PHCs are the primary healthcare access point for many residents in the area.

2.2 Study Design

A cross-sectional study was conducted to gather data from healthcare workers in Zaria's PHCs.

2.3 Study Participants

The study included healthcare workers actively involved in patient care at the selected PHCs with at least six months of experience.

2.4 Exclusion Criteria

Healthcare workers on leave or not directly involved in patient care were excluded from the study.

2.5 Sample Size

A sample of 146 healthcare workers was determined using a 95% confidence level and a 5% margin of error, with a 10% allowance for attrition.

2.6 Sampling

A multi-stage sampling method was used to select respondents. First, 15 wards were randomly selected from Zaria and Sabon Gari LGAs. Then, one PHC from each selected ward was chosen randomly. Finally, healthcare workers were selected proportionately from each PHC based on their number.

2.7 Data Collection Instrument

A structured questionnaire was developed and pretested to collect data on demographics, work experience, and knowledge and skills related to paediatric emergency management.

2.8 Data Collection

Researchers visited selected PHCs to administer questionnaires and provide clarifications.

2.9 Data Management and Analysis

Collected data were cleaned, coded, and analyzed using SPSS. Descriptive statistics and chi-square tests were employed to analyze the data.

2.10 Scoring

A scoring system was used to assess skills, categorizing responses into very poor, poor, good, and excellent levels. Twenty-one questions were used to assess the health workers' skill in diagnosing and treating common paediatric emergencies. Thirteen of these questions were single response questions while 8 were multiple response questions. Each correct response was scored 2 points and each incorrect response was scored 0. The overall maximum obtainable score for skill in diagnosing and treating common paediatric emergencies was 96 and the minimum was 0.

Table 1: Grading of knowledge and skill scores

Knowledge/Skill level	Range of scores (%)
Very poor	0-29.9
Poor	30-49.9
Good	50-74.9

2.11 Ethical Considerations

Ethical clearance for this study was granted by the Department of Community Medicine at Ahmadu Bello University, Zaria. Furthermore, necessary permissions were acquired from the Directors of Primary Health Care in both Sabon Gari and Zaria Local Government Areas, as well as from the heads of all participating primary healthcare facilities. Informed written consent was obtained from all study participants before their involvement.

2.12 Study Limitations

The study's cross-sectional design provides a snapshot of knowledge and skills in December 2016. It's important to consider potential changes since then due to factors like healthcare policy shifts, training updates, and resource availability. Additionally, relying on self-reported data for skill assessment might introduce bias, as healthcare workers could overestimate their abilities or underreport their limitations.

3. RESULTS

A total of 146 questionnaires were administered, 139 questionnaires were filled and returned giving a response rate of 95%. The results were analysed and presented in tables and charts, according to the study objectives.

Table 2: Socio-demographic characteristics of respondents

Variable	Frequency (n=139)	Percent (%)
Age (years)		
<26	46	33.1
26-35	49	35.3
36-45	35	25.2
>45	9	6.5
Sex		
Male	23	16.5
Female	116	83.5
Marital status		
Married	96	69.1
Single	41	29.5
Divorced	1	0.7
Widowed	1	0.7
Tribe		
Hausa	116	83.5
Yoruba	5	3.6
Igbo	4	2.9
Others	14	10.1

Religion		
Christianity	18	12.9
Islam	119	85.6
Others	2	1.4
Education status		
Primary	15	1.4
Secondary	122	10.8
Tertiary		87.8
Qualification		
Nurse/midwife	10	29.5
CHO	25	7.2
SCHEW	20	18.0
JCHEW	15	14.4
EHO	11	10.8
Medical Lab Technician	17	7.9
Others		12.2

Most (35.3%) of the respondents were within the age group 26-35 years with a mean age of 30.9±8.8 standard deviation. Majority (83.5%) of them were females, 69.1% of them were married, 83.5% of were Hausa, majority (85.6%) of them were Muslims, most of them (87.8%) have had tertiary education, and 29.5% of them were nurses/midwives.

Table 3: Work experience of respondents

Variable	Frequency (n=139)	Percent
Below 3 years	55	39.6
3-5 years	31	22.3
Greater than 5 years	53	38.1

Fifty-five (39.6%) of the respondents had a health care working experience of less than 3 years, 31 (22.3%) had experience of between 3-5 years while 53 (38.1%) of respondents have been health workers for more than 5 years.

Table 4: Determinants of knowledge of causes and treatment of common paediatric emergencies among the health workers

Variable	Frequency (n=139)	Percent (%)	Knowledge of causes	Knowledge of treatment
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Age (years)				
<26	46	33.1		
26-35	49	35.3	$X^2=10.065$	$X^2=7.438$
36-45	35	25.2	$P=0.345$	$P=0.592$
>45	9	6.5		
Sex				
Male	23	16.5	$X^2=2.463$	$X^2=0.628$
Female	116	83.5	$P=0.482$	$P=0.890$
Marital status				
Married	96	69.1		
Single	41	29.5	$X^2=7.577$	$X^2=5.285$
Divorced	1	0.7	$P=0.577$	$P=0.809$
Widowed	1	0.7		
Education status				
Primary	2	1.4	$X^2=4.296$	$X^2=5.454$
Secondary	15	10.8	$P=0.637$	$P=0.487$
Tertiary	122	87.8		
Qualification				
Nurse/midwife	41	29.5		
CHO	10	7.2	$X^2=33.496$	$X^2=57.259$
SCHEW	25	18.0	$P=0.004$	$P=0.000$
JCHEW	20	14.4		
EHO	15	10.8		
Medical Lab Technician	11	7.9		
Others	17	12.2		

There was a statistically significant relationship between academic qualification and knowledge of causes (0.004) and treatment (0.000) of common paediatric emergencies among the health workers.

Table 5: Determinants of skills in diagnosis and treatment of common paediatric emergencies among the health workers

Variable	Frequency (n=139)	Percent (%)	Skills in diagnosis	Skills in treatment
Age (years)				
<26	46	33.1		
26-35	49	35.3	$X^2=14.842$	$X^2=13.359$
36-45	35	25.2	$P=0.095$	$P=0.038$
>45	9	6.5		
Sex				
Male	23	16.5	$X^2=6.682$	$X^2=2.993$

Female	116	83.5	P=0.083	P=0.224
Marital status				
Married	96	69.1		
Single	41	29.5	$X^2=4.820$	$X^2=9.590$
Divorced	1	0.7	P=0.567	P=0.143
Widowed	1	0.7		
Education status				
Primary	2	1.4	$X^2=4.482$	$X^2=2.245$
Secondary	15	10.8	P=0.612	P=0.691
Tertiary	122	87.8		
Qualification				
Nurse/midwife	41	29.5		
CHO	10	7.2	$X^2=32.097$	$X^2=16.891$
SCHEW	25	18.0	P=0.006	P=0.077
JCHEW	20	14.4		
EHO	15	10.8		
Medical Lab Technician	11	7.9		
Others	17	12.2		

There was a statistically significant relationship between age of respondents and skills in the treatment (0.038) of common paediatric emergencies among the health workers, as well as between academic qualification and skills in the diagnosis (0.006) of common paediatric emergencies.

Table 6: Relationship between working experience and knowledge of causes and treatment of common paediatric emergencies among the health workers

Variable	Frequency (n=139)	Percent (%)	Knowledge of causes	Knowledge of treatment
Below 3 years	55	39.6	$X^2=11.016$ P=0.880	$X^2=7.250$ P=0.298
3-5 years	31	22.3		
Greater than 5 years	53	38.1		

There was no statistically significant relationship between years of working experience and knowledge of causes and treatment of common paediatric emergencies among the health workers.

Table 7: Relationship between working experience and skills in diagnosis and treatment of common paediatric emergencies among the health workers

Variable	Frequency (n=139)	Percent (%)	Skills in diagnosis	Skills in treatment
Below 3 years	55	39.6	$X^2=6.103$ $P=0.412$	$X^2=4.472$ $P=0.346$
3-5 years	31	22.3		
Greater than 5 years	53	38.1		

There was no statistically significant relationship between years of working experience and skills in diagnosis and treatment of common paediatric emergencies among the health workers.

4. DISCUSSION

Paediatric emergencies remain a significant public health concern in Nigeria, particularly in rural areas where primary healthcare centers (PHCs) often serve as the sole source of medical care. The ability of healthcare workers in these settings to effectively manage paediatric emergencies is crucial for improving child health outcomes. This study aimed to identify the factors influencing the skill level of primary healthcare workers in managing paediatric emergencies in Zaria, Nigeria. While the study focused on knowledge and skills, it is important to consider other determinants that may impact their ability to effectively manage these emergencies. Healthcare workers in PHCs in Zaria exhibited varying levels of skills in managing paediatric emergencies. Several factors were identified as influencing their skill levels.

4.1 Healthcare System Factors

- i. **Resource Availability:** Access to essential equipment, medications, and diagnostic tools is crucial for effective paediatric emergency management. Inadequate resource availability can hinder the ability of healthcare workers to provide appropriate care (Suberu, Obohjemu & Soyobi, 2024). For instance, the lack of oxygen concentrators, defibrillators, or basic laboratory facilities can significantly impair the management of conditions like pneumonia, cardiac arrest, or infections.
- ii. **Infrastructure:** The physical infrastructure of PHCs, including the availability of adequate space, electricity, and water supply, can impact the efficiency of healthcare delivery and the ability of healthcare workers to provide timely care (Anyebe et al., 2021; David & Oluwatosin, 2023). Poor infrastructure can create challenges in maintaining a clean and hygienic environment, storing essential supplies, and operating medical equipment.
- iii. **Workload and Staffing:** Heavy workloads and insufficient staffing can lead to burnout, stress, and decreased job satisfaction among healthcare workers, which can

negatively impact their performance (World Health Organization, 2020). When healthcare workers are overwhelmed with a high number of patients or lack adequate support staff, it can be difficult to provide timely and quality care, especially for emergencies.

4.2 Organizational Factors

- i. **Leadership and Supervision:** Effective leadership and supervision can play a crucial role in creating a supportive and conducive work environment for healthcare workers. Strong leadership can foster a culture of continuous learning and improvement, provide guidance and mentorship, and ensure that healthcare workers have the resources and support they need to perform their jobs effectively (Odhus, Kapanga & Oele, 2024).
- ii. **Training and Continuing Medical Education (CME):** Regular training and CME programs can help healthcare workers stay updated on the latest guidelines and best practices in paediatric emergency management. Access to these opportunities can significantly enhance their skills and knowledge (Toma et al., 2021). Well-designed training programs can address specific knowledge gaps, improve clinical skills, and boost confidence among healthcare workers.
- iii. **Clinical Guidelines and Protocols:** The availability of clear and evidence-based clinical guidelines and protocols can provide healthcare workers with standardized guidance on the diagnosis and management of paediatric emergencies. These guidelines can help to ensure consistency of care, reduce errors, and improve patient outcomes (WHO, 2019a).

4.3 Individual Factors

- iv. **Motivation and Commitment:** Healthcare workers who are motivated and committed to providing high-quality care are more likely to develop the necessary skills and knowledge. Factors such as job satisfaction, career development opportunities, and recognition can influence motivation and commitment (WHO, 2019b; WHO, 2019c).
- v. **Personal Characteristics:** Individual characteristics, such as problem-solving skills, decision-making abilities, communication skills, and cultural sensitivity, can also impact a healthcare worker's performance in managing paediatric emergencies. These personal attributes can help healthcare workers to effectively assess patients, make appropriate diagnoses, and communicate effectively with patients and their families.

4.4 Intersectional Factors

- i. **Socioeconomic Status:** Socioeconomic disparities can influence the access to healthcare services and the quality of care that individuals receive. Healthcare workers in PHCs located in low-income communities may face additional challenges in managing paediatric emergencies due to limited resources and infrastructure.
- ii. **Cultural Factors:** Cultural beliefs and practices can influence the way healthcare workers interact with patients and their families. Understanding and respecting cultural differences can help to build trust and improve communication, which can ultimately enhance the quality of care provided.
- iii. **Gender and Age:** Gender and age can also be factors that influence the skill level of healthcare workers. Studies have shown that female healthcare workers may face

additional challenges in certain contexts, such as discrimination and limited opportunities for career advancement. Additionally, younger healthcare workers may benefit from targeted training and mentorship programs to support their professional development.

5. CONCLUSION

This study highlights the complex interplay of various factors that influence the skill level of primary healthcare workers in managing pediatric emergencies. To effectively address these factors, a comprehensive and multidisciplinary approach is essential. This involves several key strategies, starting with investing in healthcare infrastructure to enhance facilities and ensure they are well-equipped to handle pediatric emergencies. Improving staffing levels is also crucial, as it helps reduce burnout and improve patient care. Providing targeted training and continuing medical education keeps healthcare workers updated on the latest practices and protocols. Developing and disseminating clinical guidelines creates clear, evidence-based standards to improve outcomes. Fostering effective leadership and supervision encourages strong guidance and support for healthcare teams. Addressing socioeconomic disparities through policies that reduce inequalities affecting healthcare access and quality is another important aspect. Promoting cultural sensitivity ensures healthcare workers are aware of and responsive to cultural differences in patient populations. Finally, investing in research supports ongoing improvements in pediatric emergency care practices. By focusing on these areas, policymakers and healthcare providers can significantly enhance the skills of healthcare workers, leading to better quality care for children in need. This holistic approach ensures that all aspects of healthcare delivery are optimized to meet the unique challenges of pediatric emergencies.

Availability of Data and Materials

The authors declare consent for all available data present in this study.

Competing Interests

The authors declare no conflicts of interest.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

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