

**AVAILABILITY AND COMPETENCE OF HEALTHCARE PROFESSIONALS PROVIDING
PEDIATRIC CRITICAL CARE IN PUBLIC HOSPITALS IN SIAYA COUNTY, KENYA****¹ Joash Okinyi, ² Emmanuel Odero Keya & ³ Perez A. Obonyo**¹ Student, The Gertrudes Institute of Child Health and Research, Kenya^{2,3} Lecturer, The Gertrudes Institute of Child Health and Research, Kenya**Accepted: May 10, 2026****ABSTRACT**

Pediatric critical care depends on healthcare professionals who are available, trained and competent to provide timely assessment, monitoring and emergency support for children requiring advanced hospital care. In low-resource settings, workforce shortages and inadequate training severely compromise service delivery. This article evaluated the availability and competence of healthcare professionals providing pediatric critical care in public hospitals in Siaya County, Kenya, focusing specifically on: (1) professional cadre distribution, (2) pediatric critical care training status, (3) years of experience in healthcare and pediatric care, and (4) perceived adequacy of staffing and training. The study adopted a cross-sectional descriptive quantitative design. Data were collected using structured questionnaires administered to 57 healthcare professionals and facility-level personnel drawn from eight public health facilities in Siaya county. Descriptive statistics were used to summarize professional cadre, work experience, pediatric care experience, training status and perceived adequacy of staffing and training. The findings showed that nurses constituted the largest proportion of respondents (74%, n=42/57), with general nurses representing 63% (n=36/57) of all health care providers. Specialized pediatric critical care personnel were severely limited: only 9% (n=5/57) were pediatric nurses and only 4% (n=2/57) were pediatric critical care nurses. More than half (56%, n=32/57) of respondents reported that their facilities lacked staff specifically trained in pediatric critical care. Regarding training adequacy, 78% (n=44/57) disagreed or strongly disagreed that staff had sufficient pediatric critical care training. Most respondents (72%, n=41/57) also disagreed that pediatric units were adequately staffed to handle critical cases. Despite 79% (n=45/57) of respondents having more than five years of general healthcare experience, 75% (n=43/57) had less than six years of experience specifically in pediatric care, indicating limited pediatric specialization. The study concludes that strengthening pediatric critical care in Siaya County requires targeted training, mentorship, supportive deployment and continuous professional development locally. The mismatch between general healthcare experience and pediatric-specific competence represents a critical gap that must be addressed through deliberate workforce development strategies.

Keywords: Pediatric Critical Care, Healthcare Professionals, Staff Competence, Pediatric Training, Public Hospitals, Siaya County, Kenya

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INTRODUCTION

Pediatric critical care is an important part of hospital-based child health services because it supports the assessment, stabilization, monitoring and management of children who require advanced clinical attention. The quality of this care depends strongly on the availability of competent healthcare professionals, including pediatric intensivists, pediatricians, pediatric nurses, clinical officers, medical officers and other frontline providers with the knowledge and skills needed to deliver safe pediatric emergency and critical care services (Slusher et al., 2018; Olatunji et al., 2024). In public hospitals, human resource capacity is especially important because these facilities serve large populations, receive referrals from lower-level facilities and are expected to provide care despite limited budgets, high patient demand and uneven access to specialist services.

Evidence from low- and middle-income countries shows that pediatric critical care services are often weakened by shortages of trained staff, limited opportunities for continuing professional development and poor distribution of specialized personnel between urban and rural areas (Sriram & Bennett, 2020; Olatunji et al., 2024). In Kenya, these workforce challenges are reflected in the limited number of professionals with formal pediatric critical care training, especially outside major referral hospitals. County-level and rural public hospitals may have nurses, clinical officers and medical officers who provide pediatric services, but the availability of general healthcare workers does not always translate into adequate pediatric critical care competence. This creates a service delivery concern because pediatric critical care requires specific skills in assessment, monitoring, oxygen support, emergency preparedness, use of clinical tools, documentation, team coordination and timely escalation of care.

The problem addressed in this article is therefore the mismatch between the need for pediatric critical care services in public hospitals and the availability of healthcare professionals who are sufficiently trained and competent to provide such care. When staffing numbers are inadequate, or when available staff lack specialized training, public hospitals may struggle to deliver consistent, safe and responsive pediatric critical care. This gap can also increase pressure on referral systems and reduce the ability of facilities to manage pediatric emergencies effectively at the point of first contact. Therefore, this article evaluates the availability and competence of healthcare professionals providing pediatric critical care in public hospitals in Siaya County, Kenya.

LITERATURE REVIEW

Empirical Review

There is an acute global shortage of trained healthcare professionals, particularly pediatric intensivists and nurses specializing in critical care. This issue is particularly pronounced in low- and middle-income countries (LMICs), where many regions, including several in Africa, experience severe deficiencies in trained personnel. A notable example is Kenya, which grapples with a significant lack of qualified pediatric intensivists. This shortage places immense pressure on existing healthcare resources and compromises the quality of care for critically ill children (DeVita, 2025).

While numerous studies underscore the shortage of pediatric intensivists (DeVita, 2025), it is essential to recognize that the challenge in many LMICs extends beyond mere numbers. Research by Sriram and Bennett (2020) indicates that the primary issue may be the uneven distribution of healthcare personnel, with a disproportionate concentration in urban centers compared to rural areas, where access to specialized care is severely limited. Mseke et al (2024) further supports this notion, demonstrating the disparities that exist in healthcare accessibility between urban and rural populations. This situation underscores an urgent need for comprehensive strategies aimed at improving the equitable distribution of skilled healthcare professionals throughout different regions within a country.

In addition to distribution challenges, healthcare systems in LMICs face significant barriers related to the

limited availability of training programs and inadequate opportunities for professional development (Olatunji et al., 2024). However, it is important to highlight that some countries have successfully implemented innovative solutions to combat these issues. For example, a study by Padhya et al. (2021) identifies successful models of regional training centers that utilize technology to enhance the critical care knowledge and competencies of healthcare professionals. These initiatives illustrate that creative approaches can effectively alleviate the impact of resource constraints and improve both the availability and expertise of healthcare workers in pediatric critical care.

Addressing the challenges associated with the availability and competence of healthcare professionals in pediatric critical care demands a multifaceted approach. In resource-constrained settings such as Kenya, determining the most effective priorities can be particularly challenging. Numerous global and regional studies highlight the importance of investing in robust training programs, fostering supportive and sustainable work environments, and implementing strategies that enhance the equitable distribution of skilled personnel as critical components in alleviating these issues. Conversely, other studies emphasize the need for strengthening healthcare systems through improvements in infrastructure, availability of necessary equipment, and access to updated clinical guidelines and technologies (Slusher et al., 2018).

In this context, this study seeks to explore whether the availability and competence of healthcare professionals in pediatric critical care are essential for delivering high-quality care to critically ill children. By investigating this issue and recommending the implementation of evidence-based strategies, health facility leaders, as well as county and national authorities, can take meaningful steps to enhance the availability and expertise of healthcare professionals specializing in pediatric critical care. Ultimately, these efforts can lead to significantly improved health outcomes for critically ill children not only in Kenya but across the African continent.

METHODOLOGY

This study adopted a cross-sectional descriptive quantitative design. The design was considered appropriate because the study sought to assess the availability and competence of healthcare professionals providing pediatric critical care in public hospitals in Siaya County at one point in time. The target population comprised facility leaders and key healthcare personnel involved in pediatric care in public hospitals in Siaya County, including nurses, clinical officers, medical officers, heads of pediatric units, facility in-charges. The study focused on public health facilities offering pediatric services in Siaya County, including Level 3, Level 4 and Level 5 facilities. Siaya County was selected due to its high child mortality rates, limited access to specialized pediatric care, and significant workforce shortages typical of rural Kenyan counties. A census approach was used because the number of eligible facilities and personnel involved in pediatric critical care within the county was relatively small. The study targeted 60 respondents from eight facilities. All healthcare professionals directly involved in pediatric service delivery at the selected facilities were invited to participate. 57 complete responses were obtained, representing a 95% response rate. According to Sataloff and Vontela (2021), a response rate above 70% is considered acceptable for survey research. Participants were drawn from eight health facilities in Siaya County. Data were collected using a structured questionnaire administered through KoboToolbox. The questionnaire was designed around the study objectives and included closed-ended questions, Likert-scale items, multiple-choice questions and numerical response items. For this article, the analysis focused on variables related to human resource capacity, including professional cadre, years of experience in healthcare, years of experience in pediatric care, availability of staff trained in pediatric critical care, number of specialized staff and perceived adequacy of pediatric critical care training. The structured questionnaire underwent pretesting in four health facilities in Kisumu County, which share similar operational contexts with the target facilities in Siaya County. The pretesting exercise identified ambiguities in question wording, potential misinterpretations, and logistical issues with administering the tool. Feedback from the respondents during pretesting informed

revisions to the questionnaire layout, flow. And content. The final version of the tool incorporated these refinements to ensure validity and fitness for purpose. Reliability was assessed through test-retest consistency during the pretesting phase. Respondents were briefed on the purpose of the study and given clear instructions on how to complete the questionnaire. Completed responses were coded and securely stored for analysis. The data were cleaned and analyzed using statistical software. Descriptive statistics, including frequencies, percentages, means and standard deviations, were used to summarize staffing patterns, training levels and perceived competence. Cross-tabulations were used where appropriate to compare responses across cadres and facilities. Ethical approval and research authorization were sought from the relevant ethics and regulatory bodies, including the National Commission for Science, Technology and Innovation (NACOSTI) (Approval Number: 759397). Participation was voluntary, informed consent was obtained, and confidentiality was maintained by limiting personal identifiers and using coded responses during analysis.

FINDINGS

The findings are based on data collected through structured questionnaires administered to 57 healthcare professionals and facility-level personnel involved in pediatric care in public hospitals in Siaya County. The respondents were drawn from eight facilities: Ambira Sub County Hospital, Bondo Sub County Hospital, Madiany Sub County Hospital, Pap Kodero Health Centre, Siaya County Referral Hospital, St. Elizabeth Lwak Hospital, Ukwala Sub County Hospital and Yala Sub County Hospital.

The study evaluated the availability and competence of healthcare professionals providing pediatric critical care in these public hospitals. The main variables assessed included professional cadre, role in the facility, years of general healthcare experience, years of pediatric care experience, availability of staff trained in pediatric critical care, adequacy of pediatric staffing and perceived sufficiency of pediatric critical care training. Table 1 presents a summary of the healthcare workforce characteristics and training-related indicators used to assess pediatric critical care capacity in the selected facilities.

Table 1 shows a summary of the study participants' demographic information as per facility, role in the facility, and professional cadre.

Table 1: Distribution of Respondents by Role in Facility and Professional Cadre

Indicator	Category	Frequency (n=57)	Percentage
Professional cadre	General nurse, non-pediatric	36	63%
	Pediatric nurse	5	9%
	Pediatric critical care nurse	2	4%
	Medical officer	5	9%
	Other cadres	9	16%
	Total	57	100%
The facility has staff trained in pediatric critical care	Yes	25	44%
	No	32	56%
Total		57	100%
The pediatric unit is adequately staffed to handle critical cases	Strongly disagree	22	39%
	Disagree	19	33%
	Neutral	12	21%
	Agree	3	5%
	Strongly agree	1	2%
	Total	57	100%
Staff have sufficient pediatric critical care training	Strongly disagree	22	39%
	Disagree	21	37%
	Neutral	5	9%
	Agree	6	11%
	Strongly agree	2	4%
	Total	56	100%

Note: Total percentages may not sum to 100% due to rounding.

Among the healthcare providers, nurses constituted the majority of the health workforce (74%, n=42/57), followed by clinical officers (12%, n=7/57). Regarding professional cadre, general nurses were the most numerous (63%, n=36/57) compared with specialized nursing cadres: pediatric nurses (9%, n=5/57) and pediatric critical care nurses (4%, n=2/57)

Table 1 shows that public hospitals in Siaya County have healthcare professionals involved in pediatric care, but there remains a clear gap in the availability of personnel with specific pediatric critical care training. Only 44% (n=25/57) of respondents reported that their facilities had staff trained in pediatric critical care, suggesting limited specialized capacity within the facilities. In addition, Figure 1 shows that 56% (n=32/57) of healthcare providers had not received pediatric critical care training, further highlighting a competence gap among frontline providers.

Training on Paediatric Critical Care

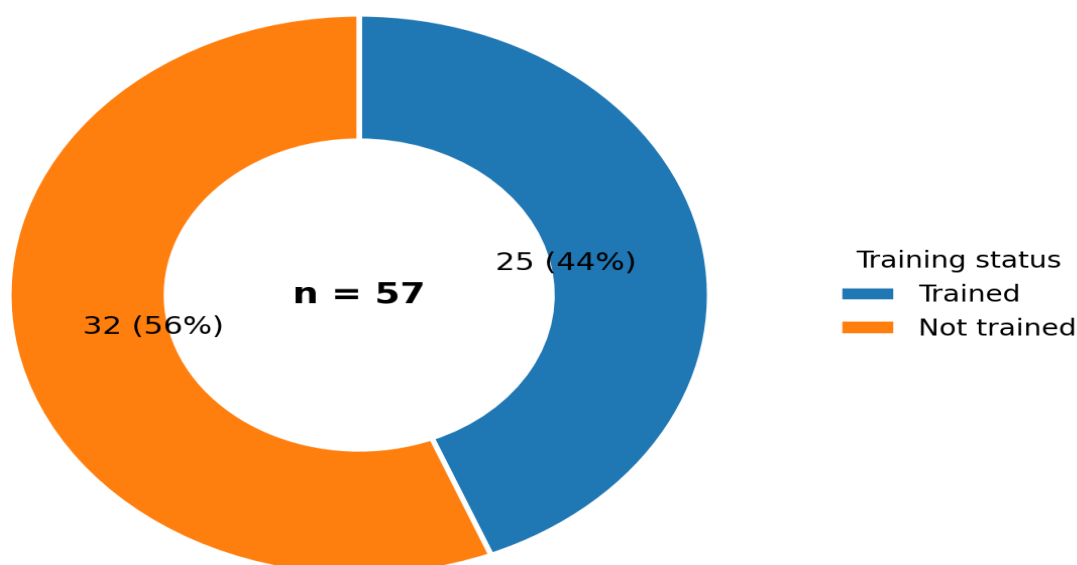


Figure 1: Training on Pediatric Critical Care

The study findings further revealed that, despite most healthcare providers (79%) having work experience of more than 5 years, 75% of them have less than 6 years of work experience in pediatric critical care, as evidenced in Tables 1 and 2 below. The low number of healthcare providers trained on pediatric critical care shows a significant gap in on-the-job training from peer to peer, mentorship of supervisors to their junior staff, and management of critical conditions.

Table 2 presents the respondents' overall years of work experience in healthcare, which helps to show the general level of clinical experience among healthcare professionals in the selected public hospitals.

Table 2: General Healthcare Experience of Respondents

Years of Work Experience	Number of Respondents	Percentage
< 5 years	12	21%
5 - 10 years	25	44%
10 - 15 years	9	16%
> 15 years	11	19%
Total	57	100%

The findings show that 25 respondents, representing 44%, had worked for 5–10 years, making this the largest group. This was followed by 12 respondents, representing 21%, who had worked for less than 5 years. A further 11 respondents, representing 19%, had more than 15 years of work experience, while 9 respondents, representing 16%, had worked for 10–15 years. These findings indicate that most healthcare professionals (79%, n=45/57) had several years of general healthcare experience (more than 5 years). However, general work experience does not automatically mean that the providers have specialized competence in pediatric critical care, which requires specific training and practical exposure. Therefore, while the findings show that many respondents were not new to healthcare practice, further assessment was needed to determine whether their experience was directly related to pediatric care and pediatric critical care.

Table 3 presents the respondents' years of experience specifically in pediatric care, distinguishing general healthcare experience from direct exposure to child health service delivery.

Table 3: Years of work experience in pediatric critical care

Years of Work Experience	Frequency	Percentage
2–5 years	25	35%
Less than 2 years	12	12%
6–10 years	11	12%
More than 10 years	9	35%
Total	57	100%

Table 3 presents the respondents' years of experience specifically in pediatric care. The findings show that 23 respondents, representing 40%, had 2–5 years of pediatric care experience, while 20 respondents, representing 35%, had less than 2 years of experience. Only 7 respondents, representing 12%, had 6–10 years of pediatric care experience, and another 7 respondents, representing 12%, had more than 10 years of experience. This shows that although many respondents had general healthcare experience, most had relatively limited experience in pediatric care. The findings suggest a gap between general clinical experience and specialized pediatric exposure, which may affect competence in pediatric critical care service delivery.

Table 4 presents respondents' opinions on the sufficiency of pediatric critical care training among healthcare professionals. This helps to assess perceived competence and identify whether available staff have the specialized training needed to provide pediatric critical care services.

Table 4: Opinion on Sufficient Training on Pediatric Critical Care

Opinion	Frequency	Percentage
Strongly Disagree	22	39%
Disagree	22	39%
Neutral	6	11%
Agree	5	9%
Strongly Agree	1	2%
Total	57	100%

Table 4 presents respondents' views on whether healthcare professionals had sufficient training in pediatric critical care. The findings show that 22 respondents, representing 39%, strongly disagreed, while another 22 respondents, also representing 39%, disagreed. This means that 78% of the respondents felt that healthcare professionals did not have sufficient pediatric critical care training. A smaller proportion, 6 respondents, representing 11%, were neutral, while 5 respondents, representing 9%, agreed, and only 1 respondent, representing 2%, strongly agreed. These findings show a clear training gap among healthcare professionals providing pediatric care in public hospitals in Siaya County. The results suggest that improving pediatric critical care capacity should include regular in-service training, mentorship, skills updates and continuous professional development for frontline healthcare providers.

DISCUSSION

This study evaluated the availability and competence of healthcare professionals providing pediatric critical care in public hospitals in Siaya County, Kenya. The findings reveal critical gaps in specialized workforce capacity, training, and perceived competence that have direct implications for child health outcomes in the county.

Availability of Healthcare Professionals

The finding that nurses constitute 74% of the pediatric workforce in Siaya County is consistent with the broader Kenyan healthcare context, where nurses are the primary providers of frontline clinical services,

especially in rural and peri-urban areas (Kenya Health Federation, 2021). However, the severe shortage of specialized pediatric critical care nurses (only 4% of respondents) and pediatric nurses (9% of respondents) is deeply concerning. This finding aligns with Kumar and Canarie (2019), who documented that in Kenya, pediatric critical care is often delivered by general nurses without specialized training due to workforce shortages. The 56% of facilities lacking staff trained in pediatric critical care represents a systemic failure that likely contributes to preventable child mortality.

Comparatively, high-income countries maintain pediatric critical care nurse-to-patient ratios of 1:1 or 1:2 in PICUs, with mandatory specialized certification (Slusher et al., 2018). In Siaya County, the absence of such specialized staffing means that critically ill children are managed by general nurses who may lack the skills to recognize early deterioration, administer complex medications, or operate specialized equipment. This finding is particularly alarming given that Siaya County Referral Hospital, a Level 5 facility, was included in the sample and should ideally serve as a referral center for pediatric critical care.

The shortage of specialized pediatric critical care professionals in Siaya County reflects a national problem. Sriram and Bennett (2020) noted that Kenya has fewer than 50 pediatric intensivists serving a population of over 50 million people, with most concentrated in Nairobi. The distribution problem is even more acute at the county level, where specialist recruitment and retention are hampered by lack of career progression incentives, limited funding, and migration to private sector or abroad—factors identified by 63% and 42% of respondents in this study, respectively.

Competence and Training Gaps

The finding that 78% of respondents disagreed or strongly disagreed that staff had sufficient pediatric critical care training is striking. This perception gap exists despite 79% of respondents having more than five years of general healthcare experience. The discrepancy between general experience and pediatric-specific competence is a critical finding of this study. It suggests that years of clinical practice alone do not substitute for targeted pediatric critical care training. This aligns with Olatunji et al. (2024), who found that in LMICs, limited availability of training programs and inadequate opportunities for professional development are major barriers to building pediatric critical care competence.

The 75% of respondents with less than six years of pediatric care experience, despite most having longer general healthcare experience, indicates that staff rotation patterns may limit pediatric exposure. Healthcare workers in Siaya County may be moved between departments (adult medical wards, maternity, outpatient departments, and pediatric units) without sufficient time to develop and maintain pediatric-specific competencies. This finding is consistent with Onyango et al. (2024), who documented that task shifting and staff rotation in Kenyan public hospitals often result in pediatric units being staffed by nurses without recent pediatric experience or training.

The perceived inadequacy of training has direct clinical consequences. Research has consistently demonstrated that competent pediatric critical care requires specific skills in: (1) pediatric assessment (recognizing that children deteriorate differently from adults), (2) weight-based medication dosing and fluid management, (3) airway management for pediatric anatomy, (4) use of pediatric-specific equipment (ventilators, monitors, infusion pumps with pediatric ranges), and (5) family-centered care and communication (Slusher et al., 2018; Olatunji et al., 2024). Without these competencies, general nurses may fail to recognize early warning signs, delay escalation of care, or make medication errors that harm critically ill children.

Staffing Adequacy and Perceived Impact on Outcomes

The finding that 72% of respondents perceived pediatric units as inadequately staffed to handle critical cases, and 65% agreed that staffing negatively affects outcomes, reflects the reality of under-resourced public hospitals in Kenya. This perception is supported by objective evidence: Kenya's nurse-to-population ratio is approximately 15:10,000, far below the WHO benchmark of 44:10,000 (WHO, 2020). At the facility level,

inadequate staffing leads to missed nursing care—essential interventions that are omitted due to time constraints. In pediatric critical care, missed care can be fatal.

The 65% of respondents who agreed that staffing negatively affects outcomes align with international evidence linking nurse staffing ratios to patient mortality. A landmark study by Aiken et al. (2014) found that each additional patient per nurse was associated with a 7% increase in hospital mortality. In pediatric critical care, where patients require intensive monitoring and frequent interventions, the relationship between staffing and outcomes is even more pronounced. The finding that 35% of respondents strongly agreed that staffing affects outcomes suggests that frontline providers are acutely aware of the risks posed by understaffing.

Comparison with Other Low-Resource Settings

The workforce challenges identified in Siaya County are not unique but reflect broader patterns across sub-Saharan Africa. In Malawi, Molyneux et al. (2019) documented that pediatric wards were often staffed by nurses without any formal pediatric training, contributing to hospital mortality rates exceeding 15% for common conditions like pneumonia and malaria. In Uganda, a study of district hospitals found that less than 10% of nurses had received any pediatric emergency training, and none had specialized pediatric critical care qualifications (Prin & Bartlett, 2018).

However, some LMICs have made progress. Rwanda has invested heavily in pediatric nursing education, establishing a national pediatric nursing curriculum and requiring pediatric rotation for all nursing students. Ethiopia has implemented a pediatric critical care training program for nurses and clinical officers, with mentorship from international partners. These examples suggest that targeted investment in training and workforce development can yield improvements even in resource-constrained settings (Padhya et al., 2021).

Implications for Practice and Policy

The findings of this study have several practical implications. First, the severe shortage of specialized pediatric critical care personnel indicates that Siaya County must adopt a multi-pronged strategy: (a) recruit and train pediatric critical care nurses and clinical officers, (b) provide in-service training for existing general nurses, and (c) establish retention incentives to prevent migration of trained staff. Second, the finding that general experience does not substitute for pediatric-specific competence suggests that continuing professional development should focus on practical skills, case-based learning, and regular competency assessment rather than passive lecture-based training.

Third, the perceived impact of staffing on outcomes indicates that facility managers should conduct workload assessments to determine safe staffing levels for pediatric units. This may require reallocation of existing staff, hiring of additional personnel, or task redistribution. Fourth, the training gap identified by 78% of respondents calls for immediate action: establishment of regular pediatric critical care training programs, including simulation-based drills, mentorship from specialists, and development of local clinical guidelines and protocols.

Study Limitations

This study has several limitations that should be acknowledged. First, the cross-sectional design captures data at a single time point and cannot assess changes in workforce capacity over time or establish causal relationships between staffing and outcomes. Second, the study relied on self-reported data from healthcare professionals, which may be subject to recall bias or social desirability bias (respondents may overstate or understate challenges). Third, the census approach, while ensuring comprehensive coverage of the target facilities, limits generalizability to other counties in Kenya with different demographic, economic, and health system characteristics. Fourth, the study did not collect objective clinical outcome data (e.g., mortality rates, complication rates) that would allow direct correlation between staffing patterns and patient outcomes. Fifth, the relatively small sample size (n=57) may limit statistical power for detecting certain associations, although the census approach was appropriate for the defined population.

Despite these limitations, the study has notable strengths. The 95% response rate minimizes non-response bias. The inclusion of multiple facilities (Levels 3, 4, and 5) provides a representative picture of pediatric critical care capacity across different levels of the health system in Siaya County. The focus on frontline providers' perceptions captures ground-level realities that may not be reflected in administrative data or facility reports.

CONCLUSION

The study concludes that the availability and competence of healthcare professionals are central to the delivery of pediatric critical care in public hospitals in Siaya County. When healthcare workers are adequately trained, experienced, and available, they are better positioned to assess, monitor and manage children who require pediatric critical care services. However, the findings show critical gaps in specialized pediatric critical care training and limited pediatric care experience among most providers, despite adequate general healthcare experience. This suggests that staffing alone is not enough unless supported by appropriate skills and continuous professional development. The mismatch between general healthcare experience and pediatric-specific competence represents a fundamental challenge that must be addressed through deliberate workforce development strategies. Strengthening training, mentorship and staff deployment can improve the availability and competence of healthcare professionals in pediatric critical care.

RECOMMENDATIONS

At the policy and county government level, the Ministry of Health, the county health department, universities, and Kenya Medical Training College should work together to strengthen pediatric critical care training in a realistic and cost-conscious manner. Since recruiting large numbers of pediatric critical care specialists may not be immediately affordable within Kenya's public health system, priority should be given to practical short courses, continuous professional development, refresher training and mentorship for nurses, clinical officers, medical officers and pediatric unit staff already serving in public hospitals. The Ministry of Health and training institutions should support standardized pediatric critical care training packages, while the county government should facilitate staff release, local training coordination and fair deployment of trained staff across facilities.

Specifically, the following actions are recommended:

1. **Establish a structured pediatric critical care training program** for general nurses and clinical officers, delivered through a train-the-trainer model to ensure sustainability. The program should include didactic content, simulation-based skills training, and supervised clinical practice.
2. **Create clear career progression pathways** for pediatric critical care nurses, including salary enhancements, recognition, and opportunities for advanced training, to address the 63% of respondents who identified lack of career progression incentives as a contributing factor to staff shortages.
3. **Develop standardized pediatric critical care training packages** that can be rolled out across all public hospitals in Siaya County, ensuring consistency in content and competency assessment.
4. **Facilitate staff release for training** without loss of pay or benefits, and provide transport and accommodation support for healthcare workers attending training away from their facilities.
5. **Implement fair deployment policies** that ensure trained pediatric critical care staff are distributed equitably across facilities rather than concentrated at the county referral hospital.

At the health facility level, managers should focus on improving how available staff are used and supported. Facilities should identify staff who have received pediatric critical care training and assign them

strategically to pediatric areas, while ensuring that less experienced staff receive mentorship during routine work. Hospitals should also maintain staff training records, organize low-cost emergency drills, use simple pediatric critical care protocols and encourage team-based learning during clinical meetings. These measures are practical in resource-limited settings because they improve competence without requiring major new expenditure. Over time, better coordination between the Ministry of Health, county government, universities, Kenya Medical Training College and health facilities can improve both the availability and competence of healthcare professionals providing pediatric critical care in Siaya County.

Recommendations for Further Research

Based on the findings and limitations of this study, the following areas are recommended for future research:

1. **Longitudinal cohort study** tracking pediatric critical care outcomes before and after implementation of structured training programs, to establish causal evidence of training effectiveness.
2. **Mixed-methods study** exploring barriers to recruitment and retention of pediatric critical care nurses in rural Kenyan counties, including qualitative interviews with staff who have left public facilities.
3. **Operational research** evaluating the cost-effectiveness of different training models (e.g., simulation-based vs. didactic; short-course vs. extended mentorship) for improving pediatric critical care competence.
4. **Implementation science study** examining the factors that facilitate or hinder translation of training into improved clinical practice at the bedside.
5. **Multi-county comparative study** assessing variation in pediatric critical care workforce capacity across Kenya and identifying high-performing counties from which lessons can be learned.
6. **Health systems research** evaluating the impact of different staffing models (e.g., dedicated pediatric nurses vs. rotating general nurses) on patient outcomes, staff satisfaction, and resource utilization.

Conflict of Interest Declaration

The authors declare no conflicts of interest. This research was conducted as part of an academic requirement for the award of a Higher National Diploma in Paediatric Critical Care Nursing from The Gertrudes Institute of Child Health and Research. No external funding was received for this study. The authors have no financial or personal relationships that could inappropriately influence or bias the work reported in this manuscript.

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