ENSIGN GLOBAL COLLEGE, KPONG

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IMPROVING QUALITY OF CARE THROUGH IN-SERVICE TRAINING AT AKATSI SOUTH MUNICIPAL HOSPITAL, VOLTA REGION, GHANA: AN EVALUATION STUDY

BY

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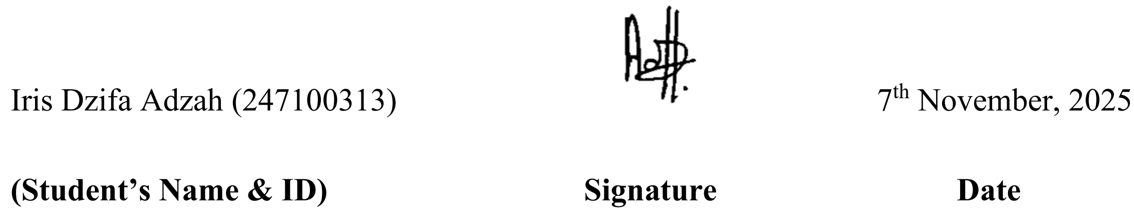
A THESIS SUBMITTED TO THE FACULTY OF PUBLIC HEALTH, DEPARTMENT OF COMMUNITY HEALTH, ENSIGN GLOBAL UNIVERSITY, KPONG IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PUBLIC HEALTH

NOVEMBER, 2025

DECLARATION

I, Iris Dzifa Adzah, hereby declare that this submission is my own work towards the award of the Master of Public Health (MPH) degree and, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.



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DEDICATION

This work is lovingly dedicated to the Almighty God for granting me strength, wisdom, and perseverance throughout this academic journey.

To my dear family, whose unwavering support, encouragement, and sacrifices have been the foundation of my success, thank you for always believing in me.

Finally, to the healthcare professionals at Akatsi South Municipal Hospital, whose commitment to improving patient care inspired this research: this work is for you.

ACKNOWLEDGEMENT

First and foremost, I am deeply grateful to the Almighty God for His grace and guidance, which have seen me through the challenges of this study.

My heartfelt appreciation goes to my supervisor, Dr Sandra Boatemaa Kushitor, for your invaluable guidance, constructive feedback, and patience throughout the research process.

I extend my sincere thanks to the management and staff of Akatsi South Municipal Hospital for granting me the opportunity to conduct this study and for their cooperation during data collection. Your commitment to quality healthcare truly motivated this work.

Special thanks to my lecturers and colleagues at Ensign Global University for their academic and moral support, which enriched my research experience.

Finally, to my family and friends, thank you for your unwavering love, encouragement, and understanding during the long hours and demanding moments. This achievement would not have been possible without you.

ABBREVIATION/ACRONYMS

ACLS	Advanced Cardiovascular Life Support
AKSMA	Akatsi South Municipal Assembly
ANC	Antenatal Care
BATLS	Battlefield Advanced Trauma Life Support
CAC	Comprehensive Abortion Care
CHAG	Christian Health Association of Ghana
CHPS	Community-based Health Planning and Services
CTG	Cardiotocography
GSS	Ghana Statistical Service
HBB	Helping Babies Breathe
HAIs	Healthcare-Associated Infections
HRM	Human Resource Management
LMICs	Low- and Middle-Income Countries
MEOWS	Modified Early Obstetric Warning Score
$MgSO_4$	Magnesium Sulphate
MoH	Ministry of Health
NHIS	National Health Insurance Scheme
NGOs	Non-Governmental Organizations
OPD	Outpatient Department
PDSA	Plan-Do-Study-Act
PHCP	Preterm Newborn Health Care Package
POCQI	Point-of-Care Quality Improvement
PPH	Postpartum Hemorrhage
QI	Quality Improvement
RR	Relative Risk
SBAR-Q	Situation, Background, Assessment, Recommendation, Question
SDGs	Sustainable Development Goals
ToT	Training of Trainers

UHC	Universal Health Coverage
UNFPA	The United Nations Population Fund
UN-OCHA	United Nations Office for the Coordination of Humanitarian Affairs
USAID	United States Agency for International Development
WHO	World Health Organization
WASH IPC	Water, Sanitation and Hygiene – Infection Prevention and Control

ABSTRACT

Background: Healthcare systems in developing countries face challenges in maintaining quality care, with Ghana presenting a mixed picture of progress and healthcare challenges. Despite global initiatives to strengthen human resources, evidence suggests that increasing skilled health workers correlates with improved healthcare outcomes. In-service training programs have emerged as a critical intervention to enhance healthcare professionals' knowledge and skills, particularly in resource-limited settings like Akatsi South Municipal Hospital.

General Objective: To evaluate the effectiveness of in-service training programs in enhancing the quality of healthcare service delivery at Akatsi South Municipal Hospital.

Methods: An embedded mixed-methods design was employed, combining a retrospective review of hospital records and key informant interviews of 31 healthcare professionals. Data from these key informants (healthcare professionals) were collected using a closed-ended questionnaire administered through Kobo Collect. Data from document review were manually obtained from hospital records as evidence of in-service training programs and key maternal and child health indicators. STATA 18 was used for analysis. Frequencies and percentages were reported. Fisher's exact test was done to identify associated variables. Variables with $p<0.05$ were considered to be significant. For the document analyses, each document was reviewed in relation to the study objectives, and key insights were extracted, summarised, and organised thematically around training coverage, health service delivery trends, and performance indicators.

Findings: The study identified several training programs, including Helping Babies Breathe (83.9% participation), Obstetric Triage and Emergency Care (87.1%), and Quality Improvement refresher programs (48.4%). Training methods were mainly practical demonstrations (74.2%). Key quality indicators improved after training: birth asphyxia rates fell from 6.8% to 2.0%, maternal

and neonatal deaths reduced from one in 2023 to none in 2024, and outpatient attendance increased by over 40%. Respondents reported improved confidence in neonatal resuscitation and obstetric triage. However, time constraint was identified as a challenge.

Conclusions: In-service training significantly enhanced healthcare workers' skills and contributed to improvements in maternal and newborn health outcomes at Akatsi South Municipal Hospital. The findings highlight the value of structured, practical, and continuous professional development. Institutional support, adequate resourcing, and integration of best practices are essential to sustaining the gains achieved through in-service training.

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CHAPTER 1

1.0 INTRODUCTION

1.1 Background

The World Health Organization emphasizes quality improvement as a fundamental element in achieving Universal Health Coverage (UHC) and the Sustainable Development Goals (SDGs). Quality healthcare delivery encompasses providing patients with appropriate diagnostic and therapeutic services while ensuring minimum risk and maximum satisfaction, characterized by being "effective, efficient, accessible, acceptable, patient-centred, equitable and safe" (WHO, 2006). Continuous quality improvement in health systems has thus become one of the priorities of global health policies (Cunningham et al., 2016).

In low- and middle-income countries (LMICs), healthcare systems face significant challenges in maintaining quality care. Despite global initiatives to strengthen human resources, evidence suggests that merely increasing the number of skilled health workers weakly correlates with improved healthcare coverage and outcomes (Campbell et al., 2016; Leslie et al., 2016) Healthcare providers, while being the primary drivers of health interventions, often lack the necessary training and skills to adequately respond to population health needs, particularly in resource-limited settings (Loignon et al., 2015; Nicol et al., 2019). Empirical evidence from South Africa demonstrates how structured in-service training and support for community health workers led to measurable improvements in healthcare quality. Over a nine-year period, intervention clinics with trained health worker teams achieved an 80% reduction in childhood pneumonia, a 73% reduction in diarrhoea cases, a 434% increase in HIV testing, and a 39% rise in cervical cancer screening compared to control clinics (Thomas et al., 2025). These findings highlight the critical role of in-service training in equipping health workers with practical skills that translate into better service delivery and improved population health outcomes.

The situation is particularly reflected in Sub-Saharan Africa, where the maternal mortality ratio remains at 442 deaths per 100,000 live births in 2023 (nearly 6 times the SDG target of 70), despite a 40 % decline since 2000 (WHO, 2025b). At the current annual reduction rate (~2.2 %), the region is projected to remain around 350 deaths per 100,000 by 2030 (WHO, 2025b).

Specifically, Juma et al. (2024) found that across 30 Tanzanian facilities, they identified significant gaps in readiness to provide emergency obstetric and neonatal care, including shortages of essential equipment, inconsistent availability of critical medicines, and limited access to clinical guidelines necessary for effective emergency response (Juma et al., 2024). Similarly, Olubodun et al. (2023) found that only 33.7 percent of young women aged 15 to 24 years in Nigeria delivered in health facilities, with particularly low utilisation in Northern Nigeria: 15.8 percent in the Northwest and 27.7 percent in the Northeast (Olubodun et al., 2023).

Within this context, Ghana's healthcare system presents a mixed picture of progress and persistent challenges. While the country has achieved notable improvements, including 70% HIV viral load testing coverage in 2023, reduced malaria parasite prevalence from 20.6% to 8.6%, and increased life expectancy from 59.2 years in 2000 to 66.1 years in 2021, significant challenges remain (WHO, 2023; WHO, 2024). As of 2021, approximately 46% of Ghana's population remained uncovered by the National Health Insurance Scheme (NHIS), highlighting ongoing accessibility issues (Alhassan et al., 2021).

These challenges are further exacerbated by infrastructural deficiencies, inequitable distribution of resources, and persistent financial constraints (Tenkorang-Twum et al., 2024). In addition, Ghana’s healthcare training programs have historically emphasized clinical and theoretical instruction, with comparatively limited attention to system-based competencies

such as quality improvement and health systems strengthening (WHO, 2020). While this orientation produces clinicians with solid biomedical expertise, it can inadvertently constrain their ability to navigate complex health system dynamics, optimise service delivery processes, and implement sustainable quality-enhancing interventions. Consequently, a training approach narrowly centred on clinical and theoretical knowledge risks producing a workforce that is technically proficient yet ill-equipped to drive systemic improvements, thereby perpetuating inefficiencies and disparities in healthcare delivery.

To bridge these gaps, healthcare systems increasingly rely on capacity-building interventions. One such approach is in-service training, which encompasses structured educational activities designed to enhance employee performance and institutional productivity through continuous professional development (Mutshatshi et al., 2022; Sajjadnia et al., 2015). Research demonstrates its effectiveness across various healthcare domains. Studies have shown that structured programs for nurses on specialised care have enhanced knowledge, practice, and self-confidence (Elgazzar et al., 2024). Similarly, implementation of Kern's Six-Step Approach for nursing orientation has demonstrated marked improvements in clinical skill application and theoretical understanding (Aslan et al., 2024). Additionally, evidence suggests that quality healthcare improvement initiatives that actively involve relevant stakeholders in a bottom-up approach, such as the SafeCare programme in Ghana, yield better outcomes in resource-limited settings (Alhassan et al., 2016, 2019).

At Akatsi South Municipal Hospital, in-service training programs play a crucial role in equipping healthcare workers with the skills needed to improve service delivery. However, there is limited research assessing their effectiveness. This study, therefore, evaluated these programs through a retrospective descriptive review and interviewed key informants (health workers), contributing to the broader goal of improving healthcare quality in Ghana's municipal health facilities.

1.2 Problem Statement

Ghana has made significant structural reforms and increased investment in health infrastructure and financing mechanisms aimed at achieving universal health coverage (UHC) (Amoah et al., 2021; Nkrumah & Abekah-Nkrumah, 2019). However, progress toward UHC remains uneven, particularly in municipal hospitals, where persistent challenges such as workforce shortages, limited resources, and increased demand undermine the delivery of quality healthcare services (Atiga et al., 2023; Lozano et al., 2020).

Healthcare worker turnover in Ghana is alarmingly high. A study across three Eastern Region districts found 69% of health workers, including doctors, nurses, and pharmacists, intended to leave their current posts (Bonenberger et al., 2014). Another study by Kumah et al. (2024) across 30 facilities revealed a turnover intention rate of 67.4% of staff in Christian Health Association of Ghana (CHAG) hospitals. Similarly, in Greater Accra, Tawiah et al. (2024) found a 59.8% prevalence of turnover intention, particularly associated with excessive overtime, understaffing, and lack of support. A central driver of this turnover is the lack of in-service training and career development opportunities. Bonenberger et al. (2014) demonstrated that workers who perceived limited career development had a 44% higher likelihood of turnover intention (OR = 0.56, 95% CI: 0.36–0.86).

Literature has revealed various challenges associated with workforce training (Abassah-Buabeng, 2016; Bluestone et al. 2021). A study by Abassah-Buabeng (2016) at the Trauma and Specialist Hospital, Winneba, identified several critical challenges associated with the training of hospital staff under the Ghana Health Service, including insufficient budgetary allocation, lack of interest and commitment from management, and inadequate motivation and recognition for staff participation in training programs.

Additionally, Bluestone et al. (2021) identify key challenges with the traditional Training of Trainers (TOT) model, including limited impact on provider performance (only 2 additional actions out of 18–40 expected per visit) and poor knowledge transfer due to inadequate trainer preparation and lack of post-training support.

Akatsi South Municipality faces several health challenges that threaten the provision of equitable, high-quality care. The district has one of the highest adolescent pregnancy rates in Ghana's Volta Region, approximately 15% in 2024, with 339 pregnancies reported, including five girls aged 10–14, placing it second in the region for teenage pregnancies ("Teenage Pregnancy: Akatsi South among Top Three in Volta under 2024 Half-Year Review," 2024). Concurrently, severe infrastructural failures have impaired service delivery as the municipal hospital has experienced structural decay, leaking roofs, faulty electrical wiring, and even fire incidents in the theatre in 2022 ("Poor Infrastructure Led to Closure of Akatsi Municipal Hospital Due to Safety Concerns Raised by Nurses and Midwives," 2023).

Despite the pressing nature of these issues, no research has been conducted on how in-service training programs influence healthcare quality and service delivery in Akatsi, Ghana. This lack of evidence hinders policymakers, researchers, and healthcare providers' understanding of the full impact of in-service training programs on healthcare quality and limits their ability to identify challenges, best practices, and effective strategies for optimising training initiatives in Ghana.

1.3 Rationale of the Study

Providing quality healthcare is vital for improving the health and well-being of patients and for building stronger health systems. The World Health Organisation (WHO) explains that a well-functioning health system relies on several key parts, such as effective service delivery, a skilled and motivated workforce, reliable health information, access to essential medicines,

adequate financing, and good leadership. When these areas work well together, they create a system that delivers safe, efficient, and people-centred care.

However, healthcare facilities in developing countries, including Ghana, often face challenges such as inadequate staff competencies, evolving medical practices, and limited access to continuous professional development programs (Nkrumah & Abekah-Nkrumah, 2019). In-service training programs serve as a critical intervention to enhance the knowledge and skills of healthcare professionals, ensuring they can provide effective and evidence-based care. In-service training programs are widely recognised as a crucial strategy for improving the knowledge, skills, and competencies of healthcare professionals (Chaghari et al., 2017; Nicol et al., 2019). A well-trained, competent, and adequately supported workforce is fundamental to the success and sustainability of any healthcare system (Li et al., 2023).

Healthcare quality improvement is even a more critical priority in Ghana's health system, particularly at the district and municipal hospital level where a significant portion of the population receives medical care. The rationale for this study stems from the pressing need to understand and evaluate how in-service training programs contribute to healthcare quality enhancement at Akatsi South Municipal Hospital.

Despite the recognised importance of in-service training, there is limited empirical evidence assessing its impact on healthcare quality in municipal hospitals like Akatsi South Municipal Hospital. It is not only timely, but the study aligns with Sustainable Development Goal 3 (Good Health and Well-being), specifically targets 3.8 and 3.c, as it seeks to enhance the quality of healthcare service delivery through the evaluation and strengthening of in-service training programs for health professionals (Howden-Chapman et al., 2017; Morton et al., 2017).

By examining how well current training programs work, the research will help reveal the areas where healthcare workers still need support and what challenges may be preventing effective

delivery of care. This evidence is especially important in Ghana, where there is limited local research on how continuous professional development shapes healthcare outcomes. The results of the study can also guide health authorities in improving policies on staff training, resource distribution, and workforce development to strengthen hospital performance at the district level. Additionally, insights from this research can help improve future training programs by making them more relevant to the real needs of healthcare workers, especially those in resource-limited settings and better aligned with essential skills required to provide quality services.

Donabedian Model

This study adapted the Donabedian model, which is widely recognised in health systems research. Donabedian (1966) proposed that healthcare quality can be assessed through three interrelated components: structure, process, and outcome. Structure refers to the resources, organisational systems, and infrastructure that support healthcare delivery, such as the availability of trained personnel, medical equipment, and institutional policies. Process involves the way care is provided, including the application of clinical skills, adherence to guidelines, and interactions between healthcare workers and patients. Outcome reflects the results of care, including patient health status, recovery, satisfaction, and overall quality of service delivery.

This framework is particularly relevant for evaluating the impact of in-service training programs on healthcare quality. In the context of Akatsi South Municipal Hospital, structure encompasses the availability of training opportunities and essential resources to support maternal and newborn care. Process captures how healthcare providers apply the knowledge and skills acquired through these trainings, such as conducting Helping Babies Breathe drills

or implementing obstetric triaging. Finally, outcome represents measurable improvements in patient care, including safer deliveries, higher survival rates, and enhanced quality of service.

By using the Donabedian model as a theoretical lens, this study can link the hospital's training programs to observed changes in healthcare practices and patient outcomes, providing a structured approach to understanding how workforce development contributes to quality improvement in resource-limited settings.

1.4 Conceptual Framework

This present study adapts Donabedian's Quality of Care Model as the conceptual framework to evaluate the effectiveness of in-service training programs in enhancing healthcare service delivery at Akatsi South Municipal Hospital. The Donabedian Model (Donabedian, 2005) endorsed by the World Health Organisation, remains one of the most widely used frameworks for evaluating the quality of healthcare services (Berwick & Fox, 2016; Guta, 2022). This model assesses healthcare quality through three interconnected components: structure, process, and outcomes. In the context of this study, the model provides a structured approach to evaluating the impact of in-service training programs on healthcare delivery at Akatsi South Municipal Hospital.

Structure refers to the foundational elements that support healthcare service delivery. In this study, structure encompasses the availability and accessibility of in-service training programs, workforce capacity, institutional policies, and hospital resources that influence the quality of care (McCullough et al., 2023; Yang et al., 2025).

Process involves the actual delivery of care and the interactions between healthcare workers and patients. It includes the implementation of training programs, competency development, adherence to clinical guidelines, and improved professional practices (Quentin et al., 2019;

Yang et al., 2025). This component assesses how well training programs equip healthcare workers with the necessary skills to enhance service delivery (McCullough et al., 2023).

Outcomes measure the effectiveness of training programs by evaluating improvements in patient care, health outcomes, staff performance, and overall service efficiency (Quentin et al., 2019). These may include reduced medical errors, increased patient satisfaction, better adherence to treatment protocols, and enhanced workforce productivity (McCullough et al., 2023).

In this study, the model's three core dimensions will be used to guide both data collection and analysis. The structure component will examine the types and availability of training programs. The process will assess how training is implemented and its effect on staff practices. Outcomes will evaluate expected changes in service quality, including staff performance and patient care. The model will guide analysis across all three specific objectives.

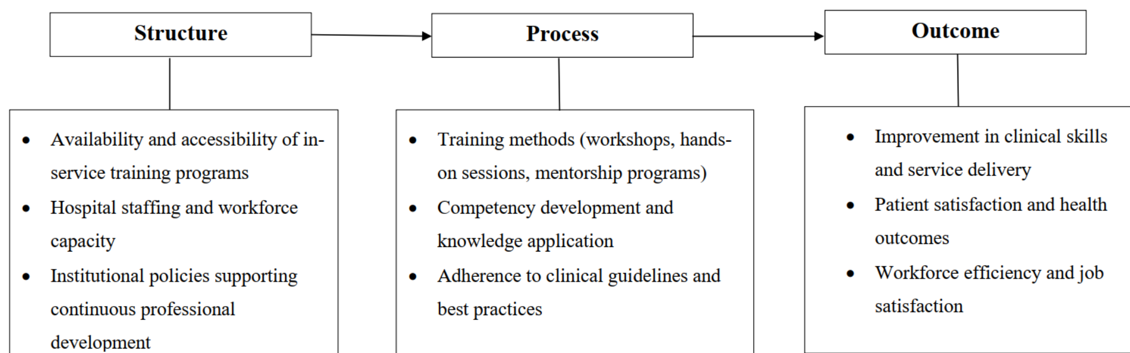

Figure 1.1: Donabedian's Quality of Care Model [adapted from (Dweik et al., 2024)**]**

1.5 Research Questions

1. What types of in-service training programs have been implemented for healthcare workers at Akatsi South Municipal Hospital?

2. How have in-service training programs impacted key quality of care indicators at Akatsi South Municipal Hospital?
3. What challenges and best practices exist in the implementation of in-service training programs for healthcare professionals at Akatsi South Municipal Hospital?

1.6 General Objective

To evaluate the effectiveness of in-service training programs in enhancing the quality of healthcare service delivery at Akatsi South Municipal Hospital.

1.7 Specific Objectives

1. To identify the types of in-service training programs implemented for healthcare workers at Akatsi South Municipal Hospital.
2. To assess the impact of in-service training programs on key quality of care indicators at Akatsi South Municipal Hospital.
3. To identify challenges and best practices in implementing in-service training programs for healthcare professionals at the Akatsi South Municipal Hospital.

1.8 Profile of Study Area

Akatsi South Municipality, located in the Volta Region of Ghana, covers a land area of approximately 536 square kilometres. It constitutes about 2.6% of the regional land area and 0.2% of the national land area (AKSMA, 2024). The municipality was initially part of the Akatsi District, created in 1989 under Legislative Instrument (LI) 1470. In 2012, the district was split into Akatsi North and Akatsi South, following the enactment of LI 2165, with the Akatsi South Municipal Assembly being officially established in 2020 under LI 2420 (GSS, 2021). Akatsi, the municipal capital, is situated approximately 80 kilometres from Ho, the regional capital, and 140 kilometres from Accra, the national capital. The municipality shares

boundaries with Keta Municipality and Anloga District to the south, Ketu North to the east, South and Central Tongu Districts to the west, and Akatsi North and Agotime Ziope Districts to the north (AKSMA, 2024).

The municipality had a population of 92,494 as recorded in the 2021 Population and Housing Census, with females constituting 53.4% and males 46.6%. With an annual growth rate of 2.4%, the projected population for 2025 is 101,699 (GSS, 2021). The majority of residents are engaged in petty trading, farming, and livestock rearing, with rice cultivation being a dominant agricultural activity. The health sector in Akatsi South Municipality comprises 36 health facilities, including two hospitals, six health centres, one Christian Health Association of Ghana (CHAG) facility, and multiple Community-based Health Planning and Services (CHPS) zones. Public facilities account for 94% of healthcare infrastructure. The municipality has a limited number of medical personnel serving both the public and private health sectors (AKSMA, 2024).

Akatsi South District Hospital is a health facility under the supervision and guidance of the Ghana Health Service. Ghana Health Service (GHS) is a public Service body established by Act 525 of 1996 of the Parliament of Ghana. The Akatsi South District Hospital is located at Kpotame along the Akatsi-Tadzewu road (AKSMA, 2024). It was built as a Dental Clinic in 1992 by the Social Security and National Insurance Trust (SSNIT) and had operated as such until 1994, when it was handed over to the Ministry of Health and upgraded to a Health Centre for the district. The Health Centre was upgraded to the status of a District Hospital in the year 2006. The hospital has now become the final referral hospital in the Akatsi District after it was upgraded to a District Hospital status in 2006 (AKSMA, 2024).

The Akatsi South Municipal Hospital has a total staff strength of two hundred and twenty-seven. This includes three (3) doctors, one pharmacist, 150 nurses, 30 midwives, 8 laboratory

personnel, 3 anaesthetists, 13 other clinical staff, and 23 non-clinical staff. The facility provides a comprehensive range of healthcare services, including outpatient, inpatient, public health, and specialist surgical services. Outpatient care encompasses 24-hour emergency services, general consultations, diagnostic imaging, laboratory and blood bank services, pharmacy and dispensary support, as well as specialised clinics for hypertension, diabetes, mental health, eye care, and cervical cancer screening (AKSMA, 2020). Inpatient services cover medical, surgical, obstetric, gynaecological, and paediatric care, ensuring holistic treatment for admitted patients. Additionally, the hospital offers essential public health services such as antenatal and postnatal care, maternal and child health programs, family planning, and immunisation (AKSMA, 2024; AKSMA, 2020).

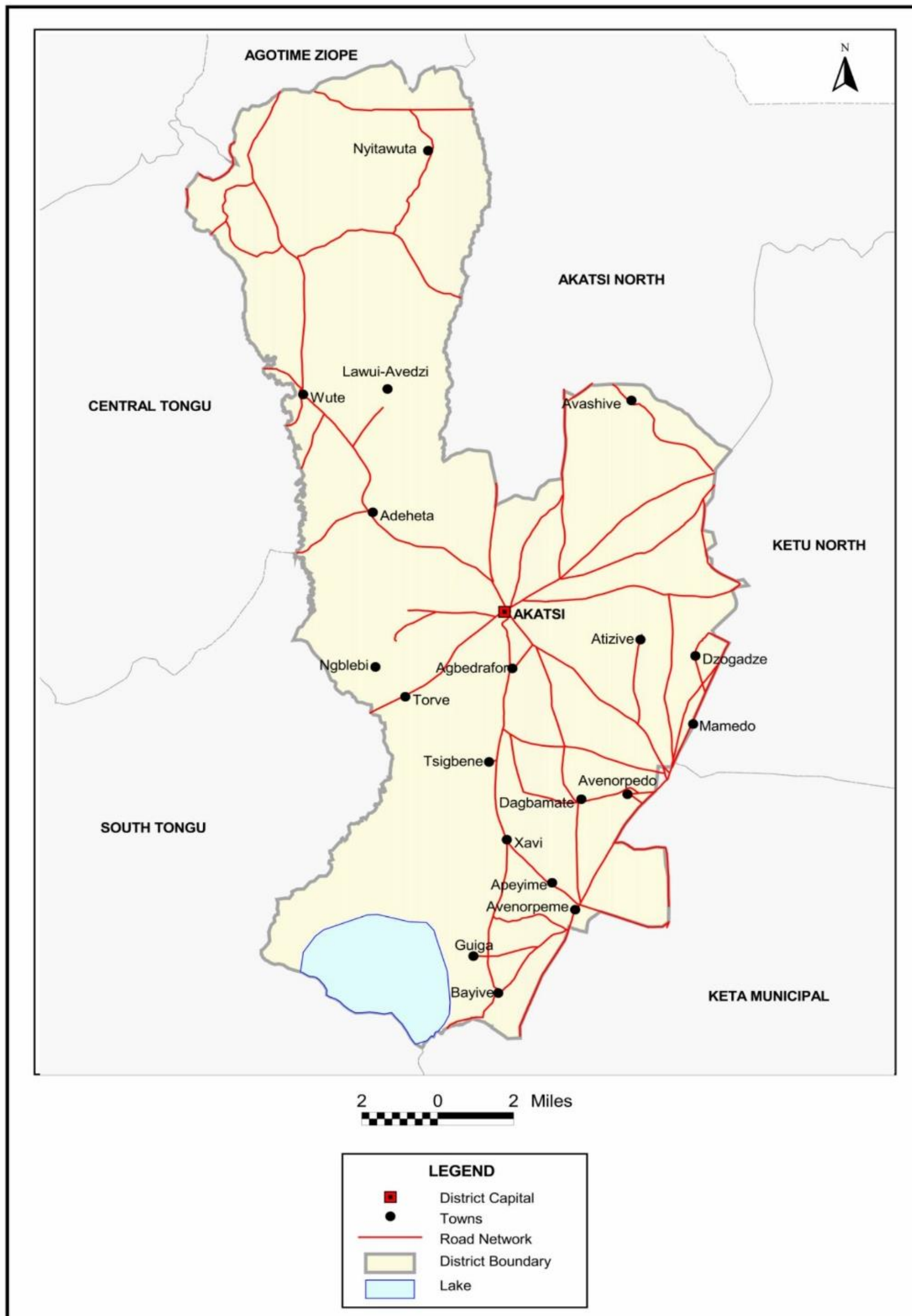

Figure 1.2: *Map of Akatsi South Municipality*

Source:*(GSS, 2021)*

1.9 Scope of Study

This study focused on exploring how in-service training programs influence the quality of care at Akatsi South Municipal Hospital in Ghana. It specifically examined the types of in-service training provided to healthcare workers, evaluated their impact on selected quality of care indicators (maternal mortality, ANC attendance, neonatal mortality, skilled deliveries, and birth asphyxia rates), and identified challenges and best practices in program implementation. The study was limited to healthcare professionals within the hospital and does not extend to other healthcare facilities or pre-service training programs.

1.10 Organisation of Thesis

This thesis is organised into six chapters. Chapter one provides the background of the study, problem statement, research objectives, research questions, significance, scope, and organisation of the report. Chapter two reviews relevant literature on in-service training and quality of care, including theoretical and empirical perspectives.

Additionally, chapter three describes the research design, study setting, population, sampling techniques, data collection methods, and data analysis procedures. Chapter four presents the findings of the study based on both key informant interviews and document review.

Chapter five interprets the results in relation to the research objectives and existing literature. Chapter six summarises the key findings, draws conclusions, and provides recommendations for practice and future research.

CHAPTER 2

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter looks at how in-service training connects to the quality of care in healthcare. It starts by explaining what quality of care means and why it matters, before exploring the indicators used to measure it. The discussion then turns to the different forms of in-service training for healthcare workers, the impact these programs can have on patient outcomes and service delivery, and the challenges of putting them into practice. The chapter also highlights how these issues play out in Ghana's health system and ends with a summary of the key lessons from the literature.

2.2 Introduction to Quality of Care in Healthcare

Providing high-quality healthcare is essential for improving patient outcomes and strengthening health systems, and it can be assessed through dimensions such as effectiveness, safety, efficiency, and patient-centeredness (WHO, 2022). A widely used framework for evaluating healthcare quality is the Donabedian Model, which organizes quality into three interrelated components: structure, process, and outcome (Donabedian, 1966). Structure refers to the resources and organizational systems that support care delivery, process captures how healthcare is provided, including adherence to clinical guidelines and application of skills, and outcome reflects the results of care, such as patient recovery, satisfaction, and safety. Previous studies have applied the Donabedian model to evaluate the impact of training programs on healthcare quality, showing that interventions that strengthened staff knowledge and skills improved clinical processes and patient outcomes, demonstrating the interconnectedness of structure, process, and outcome (Chaghari et al., 2017; Li et al., 2023).

Quality of care in healthcare has evolved as a fundamental pillar of effective health service delivery, representing the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge (WHO, 2025a; World Health Organisation, 2006). The concept has gained global attention as healthcare systems worldwide grapple with increasing demands for accountability, efficiency, and patient-centred care delivery (Quentin et al., 2019).

An estimated 5.7 to 8.4 million deaths each year in low- and middle-income countries (LMICs) are due to poor quality care, accounting for up to 15% of all deaths in these settings (WHO, 2025a). About 60% of deaths related to health care in LMICs are a result of poor-quality care, while the rest are due to limited utilization of health services (Kruk et al., 2018).

Furthermore, four in ten patients with chronic conditions report a lack of trust in their health care system, a reflection of the close link between patient experience, trust, and care quality (Souvatzi et al., 2024). This poor-quality care also carries significant financial costs, with estimates of US$1.4–1.6 trillion in productivity losses each year in LMICs (WHO, 2025a).

In high-income countries, 1 in 10 patients is injured during hospital care, and 7 in 100 hospital inpatients acquire healthcare–associated infections. Unsafe care contributes to 4 deaths for every 100 people in developing settings (WHO, 2025a). Higher quality health systems could help avert 2.5 million deaths from cardiovascular disease, 900,000 deaths from tuberculosis, 1 million neonatal deaths, and nearly 50% of maternal deaths each year (Kruk et al., 2018).

In other developed countries like the United States, quality of care initiatives have been characterised by systematic implementation of evidence-based practices and robust performance measurement systems. A study by Bauhoff et al. (2025) analysing hospital efficiency and quality measures across Latin American and Caribbean countries demonstrated the integration of comprehensive performance indicators encompassing clinical outcomes,

patient safety metrics, and resource utilization measures. These frameworks emphasize the importance of balancing efficiency with quality outcomes, particularly in resource-constrained environments (Bauhoff et al., 2025). European healthcare systems have equally led in developing comprehensive quality frameworks, with particular emphasis on patient safety and outcome measurement (Mishra et al., 2023). The WHO European framework for action (Mishra et al., 2023) established clear quality requirements anchored on evidence-based standards, demonstrating how policy frameworks can drive systematic quality improvements across diverse healthcare settings.

Sub-Saharan Africa faces unique challenges in implementing quality of care initiatives, with healthcare systems characterized by resource constraints, workforce shortages, and infrastructure limitations. A scoping review by Bresick et al. (2019) examining primary health care performance measurement across 11 Sub-Saharan African countries identified significant gaps in quality assessment instruments and indicators designed to measure safety and quality of primary care. The study revealed that existing measurement approaches often failed to capture the complexity of healthcare delivery in resource-limited settings (Bresick et al., 2019).

Additionally, healthcare quality initiatives in Sub-Saharan Africa have increasingly focused on addressing fundamental system-strengthening needs while building quality improvement capacity. A study by Arhin, Oteng-Abayie and Novignon (2023), assessing health system efficiency in achieving Universal Health Coverage goals across Sub-Saharan African countries, found that the estimated UHC coverage ranged from a minimum of 52% to a maximum of 81%, with a median coverage of 66%. These findings indicate that health systems in SSA have the potential to increase their UHC coverage by at least 19% using their existing healthcare resources, if best practices are implemented (Arhin et al., 2023).

An evaluation study by Alhassan et al. (2024) evaluating the SafeCare quality improvement programme in Ghana demonstrated significant improvements in healthcare quality standards

across over 600 private and public healthcare facilities. The program's implementation resulted in perceived improvements in patient satisfaction, service utilisation, and revenue generation, establishing Ghana as a model for systematic quality improvement in Sub-Saharan Africa (Alhassan et al., 2024).

Another study by Doku et al. (2024) examining the Ghana Heart Initiative's health system strengthening approach demonstrated how systematic quality improvement can be achieved through comprehensive training programs, equipment provision, and data system enhancements. The initiative resulted in training over 1,500 healthcare workers and establishing quality improvement mechanisms that significantly improved cardiovascular disease care delivery (Doku et al., 2024).

2.3 Quality of Care Indicators in Healthcare

The measurement of healthcare quality has undergone significant advancements over the past few decades, and these developments have been accompanied by a recognition that robust methods for assessing and benchmarking quality are essential for improving health system performance (Quentin et al., 2019). As a result, many countries, including Australia, Canada, and Nordic nations, now incorporate quality indicators as a central component of their healthcare performance reports. Furthermore, international organisations such as the Organisation for Economic Co-operation and Development (OECD) and the European Commission have intensified efforts to compare and benchmark healthcare quality across nations (Quentin et al., 2019).

To fully understand the role of quality indicators, it is necessary to examine their classification and purpose. Quality indicators are typically grouped into three categories based on Donabedian's framework: structural, process, and outcome indicators (Yang et al., 2025). Structural indicators such as the staff, infrastructure, equipment, and organisational systems

needed to deliver quality care focus on the healthcare environment. These measures are relatively straightforward to collect and verify, as they describe the foundational elements necessary for care delivery (Quentin et al., 2019). However, their primary limitation lies in the indirect relationship between structural factors and patient outcomes, as outcomes often depend on how these resources are utilised during care processes (Quentin et al., 2019).

In contrast, process indicators assess whether specific actions or procedures that reflect high-quality care are performed consistently (Panteli et al., 2019; Quentin et al., 2019). These indicators are particularly valuable for identifying areas where providers deviate from evidence-based practices, offering actionable insights for improvement (Quentin et al., 2019). Nevertheless, focusing exclusively on process indicators can present challenges, as they often require a large volume of distinct measures to provide a comprehensive picture of healthcare quality. This can inadvertently shift attention to easily measurable areas, potentially neglecting other critical but less quantifiable aspects of care (Quentin et al., 2019).

Table 1.0: Examples of Structural, Process, and Outcome Indicators

Type of Indicator	Examples
Structural Indicators	1. Availability and accessibility of in-service training programs 2. Hospital staffing and workforce capacity 3. Institutional policies supporting continuous professional development
Process Indicators	1. Training methods (workshops, hands-on sessions, mentorship programs) 2. Competency development and knowledge application 3. Adherence to clinical guidelines and best practices

Outcome Indicators	1. Improvement in clinical skills and service delivery 2. Patient satisfaction and health 0uicomics 3. Workforce efficiency and job satisfaction

Outcome indicators, on the other hand, evaluate the results of healthcare services, such as mortality rates, hospital-acquired infections, and patient satisfaction (Quentin et al., 2019). These indicators are highly relevant to patients and policymakers because they directly reflect the goals of healthcare delivery. However, outcome indicators are not without limitations (Panteli et al., 2019; Quentin et al., 2019). Patient outcomes are frequently influenced by external factors beyond the control of healthcare providers, such as socioeconomic conditions or comorbidities, complicating efforts to attribute outcomes solely to specific interventions or practitioners (Quentin et al., 2019).

In addition to their classification, quality indicators serve two primary purposes: quality assurance and quality improvement (Quentin et al., 2019). Despite these applications, the effective use of quality indicators is not without challenges. The complexity of healthcare delivery often necessitates the development of composite indicators, which aggregate multiple measures into a single score (Quentin et al., 2019).

2.4 Types of In-Service Training Programs for Healthcare Professionals

Literature has shed light on various forms of in-service training programs for healthcare providers. One of the most common types is interdisciplinary/interprofessional training programs. These are designed to foster collaboration among healthcare professionals from different disciplines (Munneke et al., 2023; Nakamura et al., 2022). For example, an interdisciplinary training program for chronic pain management involved workshops and e-learning modules, targeting general practitioners, nurses, psychologists, and other healthcare

professionals. The program focused on the biopsychosocial model of pain management and aimed to improve interdisciplinary collaboration (Munneke et al., 2023). Similarly, a program in the Philippines emphasised interprofessional collaboration in geriatric care, using scenario-based case studies to improve attitudes toward teamwork (Nakamura et al., 2022).

Another type is the case-based and scenario-based training programs, which use real-life or simulated patient scenarios to teach healthcare professionals how to manage complex clinical situations (Dei Cas et al., 2023; Kiguli-Malwadde et al., 2022). For instance, a training program for HIV care in sub-Saharan Africa used a standardised, interprofessional, case-based curriculum to enhance clinical knowledge and confidence among healthcare workers (Kiguli-Malwadde et al., 2022). Similarly, a program for diabetes management in hospitals used scenario-based case studies to improve inpatient diabetes care (Dei Cas et al., 2023).

There is also simulation-based training, an innovative approach that uses realistic patient simulations to teach clinical skills in a safe and controlled environment (Al-Worafi, 2023; Ross et al., 2013a). For example, a simulation training program for older persons' care used human patient simulation and ward-based exercises to enhance teamwork and compassionate care (Ross et al., 2013b). Another study proved the effectiveness of simulation-based training in improving the quality of care for older people by teaching team skills and empathetic communication (Al-Worafi, 2023).

Moreover, quality improvement (QI) and patient safety training programs focus on developing the skills needed to identify and address gaps in care delivery. These programs often involve structured methodologies such as Plan-Do-Study-Act (PDSA) cycles (Baernholdt et al., 2019; Kirkman et al., 2015). For example, an interprofessional QI training program for healthcare workers used seminars, online modules, and QI project work to improve patient outcomes (Baernholdt et al., 2019). Another study emphasised the importance of patient safety

education, including root cause analysis and systems-based approaches, to reduce medical errors (Kirkman et al., 2015).

Another type of in-service training program comes in the form of Continuing Professional Development (CPD). These programs are designed to support the ongoing learning and professional growth of healthcare professionals (King et al., 2021; Samuel et al., 2021). For example, a scoping review of CPD programs highlighted the effectiveness of multicomponent approaches, which combine different training methods such as workshops, eLearning, and practice-based learning (Samuel et al., 2021). A rapid evidence review study emphasised the importance of CPD, stating that it is essential for healthcare professionals to maintain and acquire the necessary knowledge and skills to provide person-centred, safe and effective care (King et al., 2021).

2.5 Impact of In-Service Training on the Quality of Care in Healthcare Settings

In-service training has emerged as a critical strategy for enhancing the quality of care in healthcare settings. Existing literature has presented various impacts of in-service training programs.

Firstly, in-service training programs have been consistently associated with improvements in clinical practices and patient safety. For instance, a quasi-experimental study conducted in intensive care units (ICUs) demonstrated that nurses who underwent in-service training exhibited significant improvements in their knowledge and practice of patient safety standards, with highly statistically significant differences observed between pre- and post-training phases (Ali & Saad, 2022). Similarly, a study focusing on healthcare workers in India found that training in point-of-care quality improvement (POCQI) and preterm newborn health care packages (PHCP) led to reductions in the use of oxygen, antibiotics, and inappropriate feeds, while also improving enteral feeding practices (Deorari et al., 2022).

Additionally, patient satisfaction is a key indicator of healthcare quality, and in-service training has been shown to positively influence this outcome. A study evaluating the impact of a service excellence program on frontline clinical staff found significant improvements in staff knowledge, perception, and attitudes toward patient experience, which were mirrored by an increase in overall patient experience scores (Alkahtani et al., 2023). Similarly, a quasi-experimental study in Iran demonstrated that training healthcare workers in communication and self-efficacy skills led to higher client satisfaction scores (Shahnazi et al., 2021).

These improvements in patient satisfaction can be attributed to the emphasis on in-service training on interpersonal skills, empathy, and patient-centred care. For example, a study in Saudi Arabia highlighted that healthcare workers with better communication and relational skills were more likely to build trust and rapport with patients, leading to higher satisfaction levels (Alarjani et al., 2021).

In-service training has also been instrumental in reducing medical errors and adverse events. A study focusing on nurses' intravenous medication process errors found that participation in in-service training programs led to a statistically significant reduction in errors, highlighting the importance of such programs in minimising harm to patients (Gomaa Mahmoud et al., 2020). Similarly, a study on infection control training in Saudi Arabia demonstrated that training improved hand hygiene compliance and reduced the prevalence of healthcare-associated infections (HAIs) (Alkahtani et al., 2023). In long-term care settings, in-service training has been linked to reductions in medication errors and fall injuries among older adults. A Canadian study found that additional training for healthcare workers was associated with improved quality of care and a lower incidence of adverse events (Mehdi et al., 2019).

Moreover, in-service training not only improves the quality of care but also contributes to cost-effectiveness and efficient resource utilisation. For example, a study in India observed that training healthcare workers in POCQI and PHCP led to reduced use of unnecessary

medications and feeds, resulting in lower healthcare costs (Deorari et al., 2022). Similarly, a study on infection control training in Saudi Arabia showed that improved hand hygiene compliance and reduced HAIs led to financial savings for healthcare institutions (Alkahtani et al., 2023).

Furthermore, one of the key strengths of in-service training is its potential for long-term impact. A study on nurses in surgical wards observed that the knowledge and practice gains from in-service training persisted over time, leading to continued high standards of care (Gomaa Mahmoud et al., 2020). To ensure sustainability, many studies recommend regular refresher training and ongoing professional development. For example, a Cochrane review on emergency care training in low- and middle-income countries emphasised the need for repeated training sessions to maintain and enhance healthcare professionals' skills over time (Opiyo & English, 2015).

2.6 Challenges in Implementing In-Service Training Programs for Healthcare Professionals

While the in-service training is a critical component of healthcare professional development, however, the implementation of these training programs is often fraught with challenges. One of the primary challenges in implementing in-service training programs is the lack of organisational support and resources (Gracía-Pérez & Gil-Lacruz, 2018). Evidence highlights that insufficient funding, inadequate infrastructure, and a lack of managerial commitment can significantly impede the success of these healthcare quality programs (Josiah et al., 2024). For instance, in Iran, financial constraints and lack of top management commitment were identified as major barriers to the implementation of in-service training policies (Choopani et al., 2024). Similarly, in Vietnam, the haphazard scheduling of training programs due to budget availability was a significant issue (Thu et al., 2023).

Another critical challenge is the mismatch between the content of the training programs and the actual needs of the healthcare professionals. In Vietnam, it was found that the in-service training provided to maternal health workers was often irrelevant to their practical needs, leading to a perceived lack of effectiveness (Thu et al., 2023). This issue is further compounded by the lack of a proper needs assessment before designing the training programs. Another study in Iran revealed the importance of conducting thorough needs assessments to ensure that the training content is aligned with the requirements of the healthcare workforce (Choopani et al., 2024).

Moreover, time constraints and workload have been recognised as barriers to in-service training. Healthcare professionals often face heavy workloads, leaving little time for participation in training programs. A study in India highlighted that time constraints are a significant barrier to nurses' participation in continuing education programs (Kumari, 2022). Similarly, in Portugal, general practitioners reported a lack of time as a major obstacle to implementing continuing medical education interventions (Reis et al., 2022).

Furthermore, the shift towards online and video conferencing-based training has introduced new challenges. A study on the acceptance of video conferencing technology for in-service training in Indonesia revealed that factors such as lack of social interaction, technical difficulties, and timing problems hindered the adoption of this technology (Ünal & Yilmaz, 2024). Additionally, the sudden shift to e-learning during the COVID-19 pandemic exposed challenges such as limited social interaction, frequent technological failures, and a lack of policies or standards for e-learning in Saudi Arabia (Al Shamari, 2022).

Cultural and language barriers can also pose significant challenges, particularly in diverse and multi-ethnic settings. A study on the implementation of a brief intervention training program in Indigenous Australian primary health care settings emphasised the importance of cultural appropriateness in the design and delivery of training programs (Sebastian et al., 2022). The

study found that face-to-face training was preferred over online modules, highlighting the need for culturally sensitive approaches.

Ensuring the sustainability of in-service training programs is another challenge. A study on the sustainability of a multi-professional obstetric emergencies training program in the Philippines identified factors such as local champions, multi-level organisational involvement, and addressing organisational challenges as critical to long-term sustainability (Ghag et al., 2021). The study also revealed the importance of engaging local clinicians and policymakers early in the implementation process (Ghag et al., 2021).

Finally, the absence of systematic follow-up and evaluation mechanisms is another significant challenge. A study on communication skills training in Denmark found that the lack of systematic follow-up was a major barrier to the sustainability of the training program (Wolderslund et al., 2022). The study emphasised the need for continuous monitoring and evaluation to ensure that the training leads to lasting behaviour change (Wolderslund et al., 2022).

In-service training has become an important strategy for strengthening Ghana's health workforce, with programs supported by the Ghana Health Service, development partners, and NGOs targeting areas such as maternal and child health, infectious disease control, and primary healthcare. Notable initiatives include Helping Babies Breathe (HBB), Essential Newborn Care (ENC), Integrated Management of Childhood Illnesses (IMCI), and training on Prevention of Mother-to-Child Transmission (PMTCT) of HIV, which have improved provider skills and, in some cases, reduced neonatal mortality (Moyer et al., 2012; Chinbuah et al., 2020). Despite these gains, challenges persist, as many programs remain short-term, donor-driven, and disproportionately concentrated in urban centres, leaving rural facilities underserved. Furthermore, the reliance on the traditional Training of Trainers (TOT) model often results in inconsistent trainer competence, weak post-training support, and uneven translation of

knowledge into practice (Bluestone et al., 2021). Consequently, while in-service training has contributed to improved service delivery in Ghana, its fragmented and donor-dependent nature underscores the need for a more coordinated, system-based approach integrated into the national continuous professional development framework.

2.7 Summary of literature review

This chapter discussed the importance of quality of care as a foundation for effective health systems, showing how it directly influences health outcomes and patient trust. It outlined how the concept has been shaped globally, with frameworks like Donabedian's model continuing to guide the way healthcare quality is assessed, even as newer methods such as digital tools and value-based measures are introduced. The section on quality indicators highlighted the roles of structural, process, and outcome measures, each providing a different but complementary perspective on how care is delivered and where improvements are needed. The review of in-service training programs showed the variety of approaches, ranging from case-based and simulation training to continuing professional development, and how they can improve patient safety, clinical practice, and satisfaction, while also reducing costs. At the same time, challenges such as poor organisational support, limited resources, heavy workloads, and lack of follow-up make it difficult to sustain the benefits of training. In Ghana, in-service training has led to progress in areas like maternal and child health, but is often fragmented, short-term, and donor-driven, with rural areas particularly disadvantaged. Taken together, the evidence suggests that while in-service training is a valuable tool for improving the quality of care, there is a clear need for a more coordinated and system-wide approach that ensures long-term impact and equity across the health system.

CHAPTER 3

3.0 METHODOLOGY

3.1 Introduction

This chapter outlines the methodological approach employed in this research study. It details the study design, study site, population, sampling techniques, data collection methods, data handling procedures, statistical analysis, ethical considerations, and expected outcomes. The methodology was carefully selected to ensure systematic data collection and analysis, ensuring accuracy while addressing the study objectives.

3.2 Research Methods and Design

The study employed an embedded mixed-methods approach, combining primarily qualitative insights from a retrospective document review of hospital reports, records, and available administrative documents regarding training programs and key maternal and child health indicators, with quantitative insight obtained from a key informant interview. The interview used closed-ended questions to gather primary data from healthcare professionals. This is to complement the document review by providing additional explanation, context and validation.

3.3 Data Collection

3.3.1 Key informant interview (Healthcare workers)

The study population comprised healthcare workers at Akatsi South Municipal Hospital who participated in in-service training programs between December 2023 and December 2024. This included doctors, nurses, midwives, pharmacists, laboratory technicians, and other healthcare personnel who had participated in in-service training programs (n=31). The study utilised a purposive sampling technique to select 31 participants for the survey component, considering the total number of healthcare workers at Akatsi South Municipal Hospital who participated in in-service training during the specified period and those currently at post.

A semi-structured questionnaire was administered through KoboCollect, a digital data collection platform (UN-OCHA, 2024). An adapted version of the WHO Workforce Alliance questionnaire was used to capture data and identify challenges encountered by healthcare workers. The questionnaire was organised to include sections on demographic details, types of in-service training received, perceived impact on quality of care, and challenges faced in implementing training programs. Data was collected through face-to-face interviews conducted by trained research assistants using mobile devices.

3.3.1.1 Exclusion Criteria for Health Workers:

Participants were excluded from the study based on several predefined criteria.

Health workers:

> Any health professional who met the inclusion criteria but was absent at the time of data collection was exempted from the study. Out of 50 potential participants, 19 were excluded from the study based on the above-stated criteria.

3.3.1.2 Independent variables from the key informant interview data

The independent variables in this study included the in-service training program characteristics to which healthcare workers have been exposed. These include the number of trainings attended, types of training, organisers of training, duration of training sessions, training delivery methods, as well as post-training perceived improvements in skills and service delivery. Additionally, socio-demographic variables such as age, gender, professional category, years of experience, and educational qualifications serve as background independent variables that may influence training participation and outcomes.

Data collection tool (Key informants - Health workers)

A structured questionnaire was developed based on the study objectives and existing literature on in-service training and quality of care. The instrument comprised seven (7) sections with a

total of 39 items. Section A collected demographic information such as age, gender, profession, educational level, and years of experience. Section B explored participation in in-service training, including training type, organizers, frequency, and delivery mode. Section C (2 sets of items: 4 confidence rating items and 1 multiple-response item) assessed baseline confidence and challenges in maternal and newborn care before training. Section D evaluated the effectiveness of in-service training. Section E examined post-training improvements in service delivery and patient outcomes. Section F measured knowledge on Helping Babies Breathe. Section G captured challenges and recommendations.

Most items were closed-ended to facilitate uniform responses and quantitative analysis, while a few open-ended prompts allowed participants to provide additional feedback. Higher scores on the Likert scale and knowledge items reflected a better perception of training effectiveness. The questionnaire required approximately 10–15 minutes to complete.

3.4 Pretesting

The survey questionnaire was pretested on the same group of healthcare professionals at the healthcare facility who participated in the training, due to the small number of trained participants, in order to ensure clarity, reliability, and validity. The pre-test revealed that most participants (8 out of 10) found the questionnaire generally clear and relevant to the study objectives. However, a few challenges were identified: some questions were considered too lengthy and required rephrasing for better understanding, while certain technical terms needed to be simplified for uniform interpretation across different professional categories. Based on this feedback, the questionnaire was refined by simplifying technical terms, rephrasing lengthy items, and adjusting the sequence of questions to improve coherence before the full-scale data collection commenced.

3.3.2 Hospital records review

Additionally, hospital reports, records, and available administrative documents regarding training programs and key maternal and child health indicators were included. These were analysed to assess the impact of in-service training programs on service delivery.

For the document review, all accessible and available relevant training records and quality indicators from December 2023 to December 2024 were included (Examples of documents used - Appendix V). This included records from Ghana's DHIMS-2, reports documenting in-service training initiatives in 2024, and the annual performance report over 3 years, all of which provided insight into their impact on healthcare service delivery.

Table 2.0: Hospital Reports and Training Documents used in this study (2022–2024)

Serial No.	Hospital department	Document title	Year of publication	Format
1	Maternity	Monthly reporting form on staff skills on HBB (January – December)	2023	PDF
2	Health Information	Annual performance review report (2023) – Akatsi South Municipal Hospital	2023	Word document
3	Maternity	Monthly reporting form on staff skills on HBB (January – December)	2024	PDF
4	Health Information	Annual performance review report (2024) – Akatsi South Municipal Hospital	2024	Word document

5	Maternity	Obstetric Triage Implementation Package (OTIP) and Modified any Obstetric Warning Score (MEOWS)	2024	Word document and Power point
6	Quality improvement/ OPD	Work improvement report on increasing OPD per capita	2024	Power Point
7	Quality improvement	Monthly quality improvement report (January – December)	2024	PDF
8	Maternity	Report on training on cardiotocography	2024	Word document
9	Maternity	Report on training in obstetric emergencies	2024	Word document
10	Quality improvement/ Maternity ward	Work improvement report of reducing high risk birth asphyxia cases	2024	Power Point

In terms of exclusion, all monthly work improvement activity report at ANC were excluded due to inability of the ANC department to retrieve reports.

3.5 Data extraction from the reports

The dependent variables in this study cover quality of care indicators, which reflect the outcomes that the in-service training programs aim to influence. These include maternal mortality, neonatal mortality, Antenatal Care (ANC) attendance, skilled delivery rates, and birth asphyxia rates. These indicators were manually extracted from the hospital reports used in the study analysis.

3.6 Data Handling

All collected data were securely stored and managed to ensure confidentiality and integrity. Electronic data collected through KoboCollect was encrypted and password-protected. Hard copies of hospital records were reviewed in a secure location, kept in locked cabinets accessible only to authorised research team members. Anonymity was maintained by using unique identifiers instead of personal information. Data backup was performed daily, and will be stored up to 10 years for reference checks.

3.7 Data Analysis

Data from key informants were analysed using STATA version 18. Descriptive statistics were used to summarise demographic data and key variables. Inferential statistics, including Fisher's exact tests, were applied to examine associations between in-service training programs and quality of care indicators. Statistical significance was set at $p<0.05$. The results were presented in tables, charts, and graphs for better interpretation.

Secondary data were obtained from a variety of hospital administrative sources, including PowerPoint presentations, word reports, graphs, and image-based records. These documents contained information on in-service training programs and maternal and child health (MCH) indicators (Maternal mortality, neonatal mortality, antenatal care (ANC) attendance, skilled delivery rates, and birth asphyxia rates. Given the dissimilarity of formats and the descriptive nature of the content, a manual content analysis approach was applied. Each document was reviewed in relation to the study objectives, and key insights were extracted, summarized, and organized thematically around training coverage, health service delivery trends, and performance indicators. No specialized software was used, as the documents primarily

consisted of straightforward reports and numerical summaries rather than narrative data requiring coding.

3.8 Ethical Consideration

Ethical approval was obtained from the Institutional Review Board of Ensign Global University (Appendix III). Written and oral informed consent was sought from all participants before recruitment after explaining the study's purpose and procedures. Confidentiality and anonymity were maintained throughout the study. Participation was voluntary, and participants were allowed to withdraw at any time without consequences. Their privacy was protected throughout the research process and to ensure confidentiality, no personally identifiable information was recorded.

3.9 Limitations of Study

This study has several limitations. First, the retrospective nature of the document review was affected by incomplete, inconsistent, or missing records, which might have limited the accuracy of the data on training activities and quality of care indicators. This was addressed by using multiple sources and complementing with key informants interviews. Secondly, the key informant interview relied on self-reported information, which might be subject to social desirability bias or recall errors, particularly regarding training participation and perceived impact.

The study was also limited to one facility (Akatsi South Municipal Hospital), which restricted the generalizability of the findings to other districts or regions. Also, due to staff attrition, the total number of trained staff who participated in the survey was limited. Finally, the cross-sectional nature of the primary data collection limited the ability to infer causal relationships between in-service training and improvements in quality of care.

3.10 Assumptions

This study was guided by several assumptions:

1. That hospital records and administrative documents used for the retrospective review are accurate, complete, and representative of actual events.
2. That healthcare professionals will respond truthfully and thoughtfully to the survey, providing valid reflections on the training received and its impact on service delivery.
3. That in-service training programs have a direct or indirect influence on key maternal and newborn health outcomes, such as maternal mortality, skilled deliveries, and neonatal survival.
4. That combining data from both key informant interview and hospital document review will enhance the validity of the findings and provide a holistic understanding of the effects of in-service training on quality of care

CHAPTER 4

4.0 RESULTS

4.1 Results

4.1.1 Socio-demographic Characteristics of Key Informants (Healthcare Workers) involved in In-Service Training programs at Akatsi south municipality

Table 4.1 shows, a total of 31 healthcare professionals working at the Akatsi South Municipal Hospital who were recruited, with a median age of 35 years and an interquartile range (IQR) of 32- 38. Majority of the participants (n=26, 83.9%) were between the ages of 30-39 years. Majority of the participants were females (n=27, 87.1%). Most (n = 22, 71%) of these participants were midwives. A little below half (n=15, 48.4%) of the participants had a working experience of 2-5 years. Most of the participants (n=19, 61.3%) had diploma level certification.

Table 4.1: Socio-demographic Characteristics of Participants (Total number of participants (N) = 31)

Variables	Frequency (n)	Percentage (%)
Age group (years)		
Median age-group (IQR)=35 (32- 38)		
20-29 years	1	3.2
30-39 years	26	83.9
40-49 years	4	12.9
Sex		
Female	27	87.1
Male	4	12.9
Professional Category		
Doctor	3	9.7
Midwife	22	80.0
Nurse	4	13.0
Other	2	6.5
Years of Working at Facility		
6 months-1 year	2	6.5
2-5 years	15	48.4

6-10 years	7	22.6
10+ years	7	22.6
Highest Educational Qualification		
Diploma	19	61.3
Bachelor's Degree/Medical Degree	12	38.7

4.1.2 Types of In-Service Training Programs implemented for healthcare workers in Akatsi South Municipal Hospital

The in-service training programs at the Akatsi South Municipal Hospital (ASMH) between 2023 and 2025 focused clearly on strengthening maternal and neonatal health services. These initiatives were designed to improve the competence of healthcare workers, promote teamwork, and reduce preventable deaths. Both key informant interview and hospital records highlight not only the extent of the training programs but also their practical impact on service delivery.

In terms of training participation, most (n=16, 51.6%) healthcare workers had attended multiple sessions, with about half reporting attendance at three to four training activities. Hospital management was identified as the main organizer of training, supported by the Ghana Health Service, international partners such as USAID, and non-governmental organizations including Kybele Ghana. The majority of sessions lasted one to three days, and training was delivered predominantly through participatory methods, particularly hands-on drills and practical demonstrations, which staff consistently rated as more effective than lectures.

The types of training programs implemented were diverse and targeted different gaps in maternal and newborn care. The most widely attended was obstetric triage and MEOWS training, with 87.1% participation (document 5). This training was rolled out in March 2024 through a Training of Trainers (ToT) model that initially targeted ten staff from antenatal, maternity and anaesthesia departments, who later cascaded the training to thirty-one others. It emphasized early recognition of complications using the Modified Early Obstetric Warning System (MEOWS) chart, structured handovers through the Situation Background Assessment

Recommendation and Question SBAR-Q (Situation Background Assessment Recommendation and Question) communication tool, and color-coded banding to prioritize patient care. By early 2025, triage compliance had reached 99%, and a functional triage unit had been established, reflecting both high uptake and institutionalization. Staff testimonies and hospital records confirmed that this initiative improved teamwork, expedited assessments, and reduced maternal anxiety.

Another widely attended program was Helping Babies Breathe (HBB), with more than 80% of staff participating (document 1). This program became a routine practice, with monthly drills in neonatal resuscitation. Staff practiced six different emergency scenarios, ranging from simple to advanced, and their performance was tracked. Most mastered the basics, though fewer were confident in advanced scenarios, which highlighted the need for ongoing practice. Initially, only three staff were trained by the regional health directorate, but by the end of 2024, the hospital had expanded the training to all forty newborn care staff. The results were dramatic: birth asphyxia rates dropped from an average of 6.8% in 2022–2023 to just 2.0% by December 2024.

In February 2025, the hospital added cardiotocography (CTG) and fetal monitoring training to further reduce birth complications (document 8). This one-day workshop taught midwives and prescribers how to interpret fetal heart rate patterns using easy-to-remember mnemonics like "DR C BRAVADO" and "VEAL CHOP MINE." Staff practiced with real CTG machines in the maternity ward, which gave them the confidence to detect fetal distress and act quickly. Records show that after this training, neonatal deaths linked to undetected fetal distress decreased, complementing the progress already made through HBB.

The hospital also invested in Quality Improvement (QI) refresher training, held in September 2024 in partnership with USAID. Thirty-seven ward and unit heads took part, learning how to

use tools like the Plan-Do-Study-Act (PDSA) cycle and root cause analysis to improve services. Participants applied these methods directly to real hospital challenges—for example, the maternity team focused on reducing birth asphyxia while the OPD team worked on increasing outpatient attendance. The results were clear: outpatient visits rose from 44,717 in 2022 to 62,554 in 2024, while birth asphyxia cases dropped by about one-third. Staff emphasized that QI training helped them solve problems in practical ways and sustain improvements over time.

In July 2024, the hospital hosted obstetric emergencies management training, led by senior obstetricians from the Volta Regional Hospital (Document 9). This two-day workshop focused on handling life-threatening situations such as postpartum hemorrhage, eclampsia, ruptured uterus, and obstructed labour. Staff practiced emergency drills using SBAR-Q for communication and followed updated protocols such as magnesium sulphate use for eclampsia. The impact was immediate: maternal deaths fell from one in 2023 to zero in 2024, while caesarean sections increased from 385 to 419, reflecting quicker and more decisive responses to emergencies.

Across all these programs, staff strongly preferred hands-on and participatory methods. Practical demonstrations, drills, and workshops were described as more useful than lectures or online training, as they built real confidence and teamwork. Scenario-based learning and cascade mentorship also stood out as effective strategies, ensuring that even those who did not attend the first sessions were still reached by trained colleagues.

This study also looked at whether participation in these trainings was linked to the professional background of staff. As shown in table 4.1, although doctors had higher attendance in some programs, such as triage and HBB, and midwives were more represented in QI training, the

statistical analysis showed no significant associations. This means training opportunities were fairly distributed among different staff groups, reflecting an inclusive approach by the hospital.

4.1.2.1 Association between types of training programs and training attendance status of healthcare workers at Akatsi South Municipal Hospital (Under objective 1)

Table 4.1 shows the relationship between training attendance status and selected training programs. Overall, no significant association was observed between the training programs and training attendance status. This is because healthcare workers perceive all training activities as equally important and beneficial to their professional roles, resulting in comparable participation rates across different programs. However, for baby breath drills program, attendance was highest among doctors (n=3, 100%) with a p-value of p = 0.253, showing no significance. Also, attendance at Emergency Obstetric and Newborn Care (EmONC) training varied across groups, with all doctors (n=3, 100%) attending. Hence, no association was found between Emergency Obstetric and Newborn Care (EmONC) training and training attendance status (p = 0.198). With respect to Quality Improvement Methods training, attendance was highest among midwives (n=10, 75%) This shows no association between Quality Improvement Methods training and training attendance status (p = 0.836). In terms of Obstetric Triaging, attendance was highest among doctors (n=3, 100%). Therefore there is no association between Obstetric Triaging and training attendance (p = 0.145). Also, no significant association was found between ‘Other’ Trainings and training attendance (p = 0.548).

Table 4.2: Association between types of training attended and training attendance status of Healthcare Workers at Akatsi South Municipal Hospital

Variables	Training Attendance Status		Total (31) N (%)	P-Value
	Training Not Attended n (%)	Training Attended n (%)		
Baby Breath drills				0.253
Doctor	0 (0.0)	3 (100.0)	3 (100.0)	
Midwife	2 (9.5)	19 (90.5)	21 (100.0)	
Nurse	1 (25.0)	3 (75.0)	4 (100.0)	
Other	1 (50.0)	1 (50.0)	2 (100.0)	
Emergency obstetric and Newborn care				0.198
Doctor	0 (0.0)	3 (100.0)	3 (100.0)	
Midwife	8 (38.1)	13 (61.9)	21 (100.0)	
Nurse	2 (50.0)	2 (50.0)	4 (100.0)	
Other	2 (100.0)	0 (0.0)	2 (100.0)	
Quality improvement methods				0.836
Doctor	2 (66.7)	1 (33.3)	3 (100.0)	
Midwife	11 (52.4)	10 (47.6)	21 (100.0)	
Nurse	1 (25.0)	3 (75.0)	4 (100.0)	
Doctor	2 (66.7)	1 (33.3)	3 (100.0)	
Obstetric triaging				0.145
Doctor	0 (0.0)	3 (100.0)	3 (100.0)	
Midwife	1 (4.8)	20 (95.2)	21 (100.0)	
Nurse	1 (25.0)	3 (75.0)	4 (100.0)	
Other	1 (50.0)	1 (50.0)	2 (100.0)	
Other Trainings				0.548
Doctor	3 (100.0)	0 (0.0)	3 (100.0)	
Midwife	17 (81.0)	4 (19.0)	21 (100.0)	
Nurse	3 (75.0)	1 (25.0)	4 (100.0)	
Other	1 (50.0)	1 (50.0)	2 (100.0)	

***NB**: Fishers exact p-values reported in this table*

4.1.2.4 Association between training methods preference and professional category among healthcare workers at Akatsi South municipal hospital

Table 4.2 shows the association between professional category and the preference for various training methodologies. There was no association between professional category and a preference for lectures (p=0.541). Again, there was no association between hands-on drills (p=0.349) and professional category. Similarly, there was no association between case studies (p=0.103) and professional category. Also, there was no association between group discussions (p=0.634) and professional category. However, an association was found between simulation-based training (p=0.050) and professional category.

Table 4.3: Association between training method preference and professional category among healthcare workers at Akatsi South municipal hospital

Training Method (Variables)	Professional Category	Training method preference		Total (31) N (%)	P-Value
		Yes n (%)	No n (%)		
Lectures					0.541
	Doctor	0 (0.0)	3 (100.0)	3 (9.7)	
	Midwife	9 (40.9)	13 (59.1)	22 (70.9)	
	Nurse	1 (25.0)	3 (75.0)	4 (12.9)	
	Other	0 (0.0)	2 (100.0)	2 (6.5)	
Hands-on Drills					0.349
	Doctor	3 (100.0)	0 (0.0)	3 (9.7)	
	Midwife	19 (86.4)	3 (13.6)	22 (70.9)	
	Nurse	1 (25.0)	3 (75.0)	4 (12.9)	
	Other	1 (50.0)	1 (50.0)	2 (6.5)	
Simulations					**0.050**
	Doctor	3 (100.0)	0 (0.0)	3 (9.7)	
	Midwife	6 (27.3)	16 (72.7)	22 (70.9)	
	Nurse	1 (25.0)	3 (75.0)	4 (12.9)	
	Other	0 (0.0)	2 (100.0)	2 (6.5)	
Case Studies					0.103
	Doctor	3 (100.0)	0 (0.0)	3 (9.7)	
	Midwife	7 (31.8)	15 (68.2)	22 (70.9)	
	Nurse	1 (25.0)	3 (75.0)	4 (12.9)	

	Other	1 (50.0)	1 (50.0)	2 (6.5)	
Group Discussions					0.634
	Doctor	2 (66.7)	1 (33.3)	3 (9.7)	
	Midwife	7 (31.8)	15 (68.2)	22 (70.9)	
	Nurse	1 (25.0)	3 (75.0)	4 (12.9)	
	Other	2 (100.0)	0 (0.0)	2 (6.5)	

4.1.3 Assessment of the impact of in-service training programs on quality of care indicators among health workers in Akatsi South Municipal Hospital

Pre-Training: Confidence of health workers

At the beginning of the training programs, most healthcare workers at Akatsi South Municipal Hospital were not fully confident in handling maternal and newborn care. Many felt only "moderately confident" when it came to important tasks like obstetric triage (61%), newborn resuscitation (45%), emergency case management (65%), and applying quality improvement methods (52%). Only a small number of staff felt highly confident.

Post-Training: Changes that occurred after training

Once the training programs were introduced, staff quickly noticed improvements. The trainings on obstetric triage and Helping Babies Breathe (HBB) were rated as the most effective by key informants, with over 70% of participants saying their skills had improved. Emergency case management and quality improvement training also helped, with about two-thirds of staff reporting gains in confidence and knowledge. Everyone agreed that the training materials provided were useful and practical.

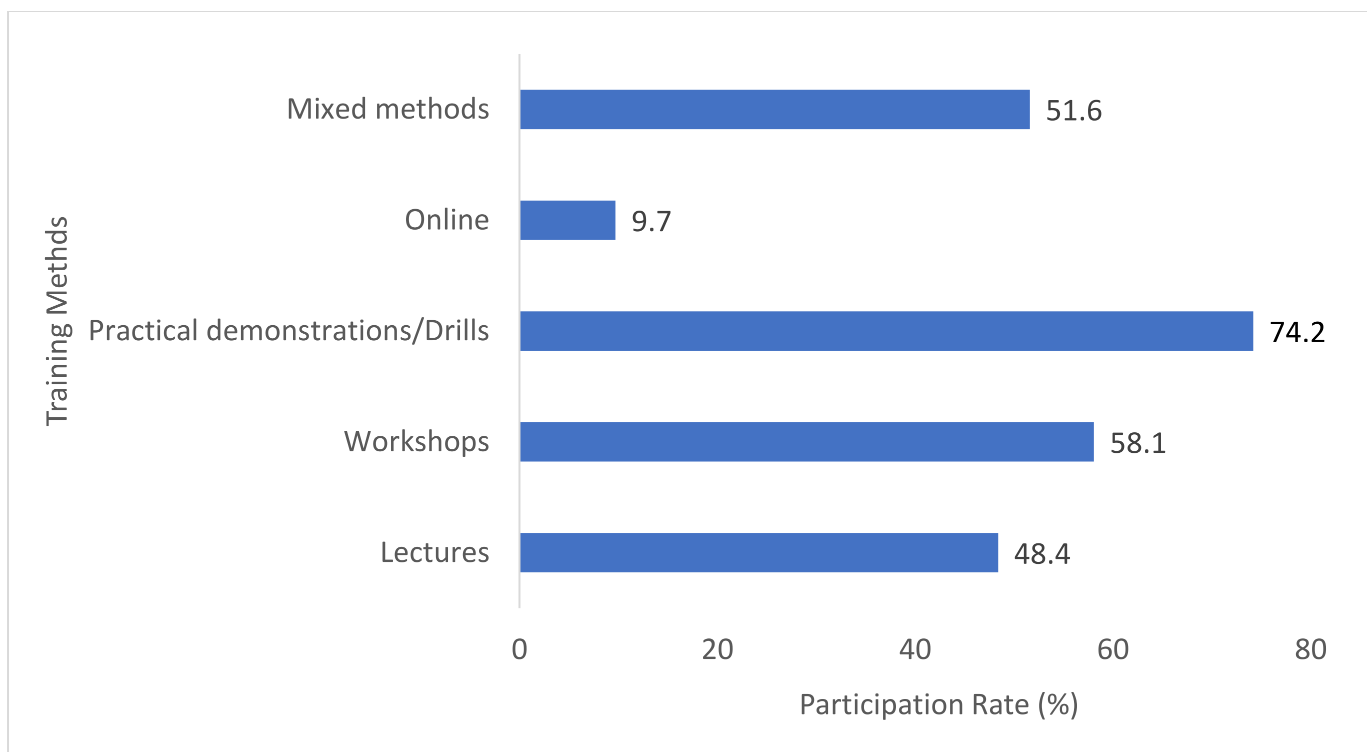

Figure 4.1: Most preferred methods of training by health workers in Akasti South Municipal Hospital

Improvements in practice and service delivery

The impact of the trainings was clear in daily practice. Staff said they were faster and more accurate in triaging patients, more confident in making clinical decisions, and better at resuscitating newborns. Teamwork also improved, with smoother communication during emergencies.

Specific practices that affect outcomes have also improved. For example, the use of partographs for monitoring labour has improved a lot, with nearly 90% of staff now applying them correctly. Overall service delivery became more reliable, and nearly half of the staff said patient outcomes had improved since the trainings. Most participants rated the overall effect of the programs as "good" or "excellent."

It was also shown that staff who attended more training sessions reported much better patient outcomes. While even a single training improved confidence and skills, repeated exposure made the biggest difference, showing that ongoing training is key to lasting improvements.

Benefits across all staff groups

The trainings benefited all doctors, midwives, nurses, and other staff. Although midwives formed the largest group, there was no real difference in effectiveness across professional categories. This shows that the training was inclusive and helped to raise the overall capacity of the whole team.

Changes in maternal and newborn outcomes

Hospital records (document 2 and 4) confirmed the improvements reported by staff. From Figure 4.1, the rate of birth asphyxia, which had been as high as 70 (6.8%) in 2022–2023, dropped to just 25 (2.0%) by the end of 2024. Neonatal deaths reduced from one(1) in 2023 to zero(0) in 2024, and fresh stillbirths fell from two (2) to zero(0). These improvements were directly linked to regular HBB drills, refresher training on partograph use, and constant skills audits.

Maternal outcomes also improved. The hospital recorded one maternal death in 2023, but none in 2024. From figure 4.2, skilled deliveries rose from 1,251 in 2023 to 1,306 in 2024, while caesarean sections increased from 385 to 419, reflecting faster and safer interventions during emergencies. Training on triage using the Modified Early Obstetric Warning System (MEOWS) and emergency obstetric care workshops played a big role in this progress by helping staff detect and respond to complications earlier.

Antenatal care (ANC) services also improved. Although fewer women registered in 2023, the quality of care was better. More high-risk pregnancies were identified, and the percentage of

women completing the recommended four ANC visits rose from 56% in 2023 to 76% in 2024. This success was linked to outreach activities and sensitization campaigns led by trained staff.

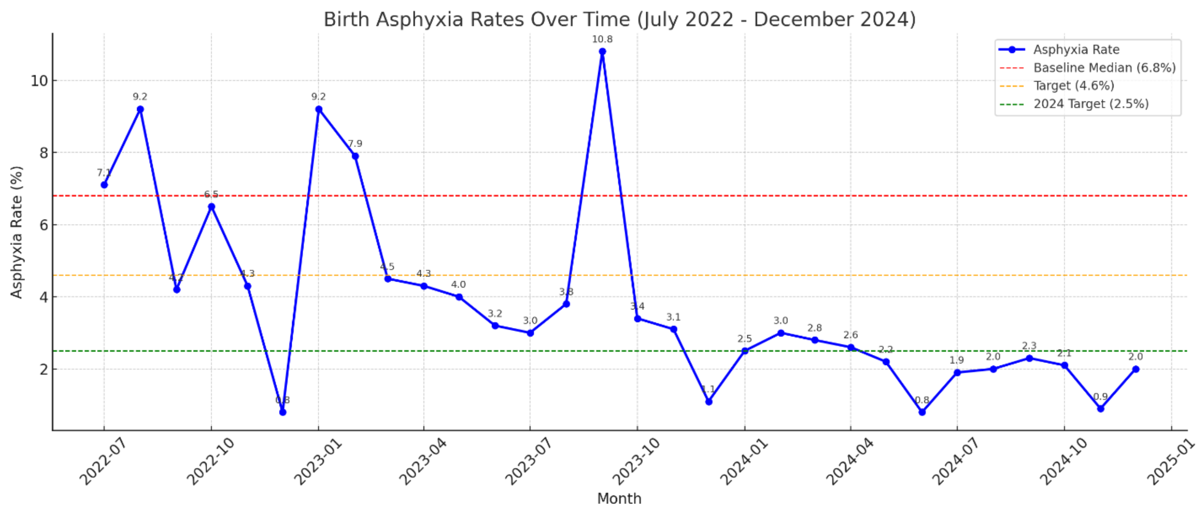

Figure 4.2: Birth Asphyxia Rates Over Time (2022-2024)

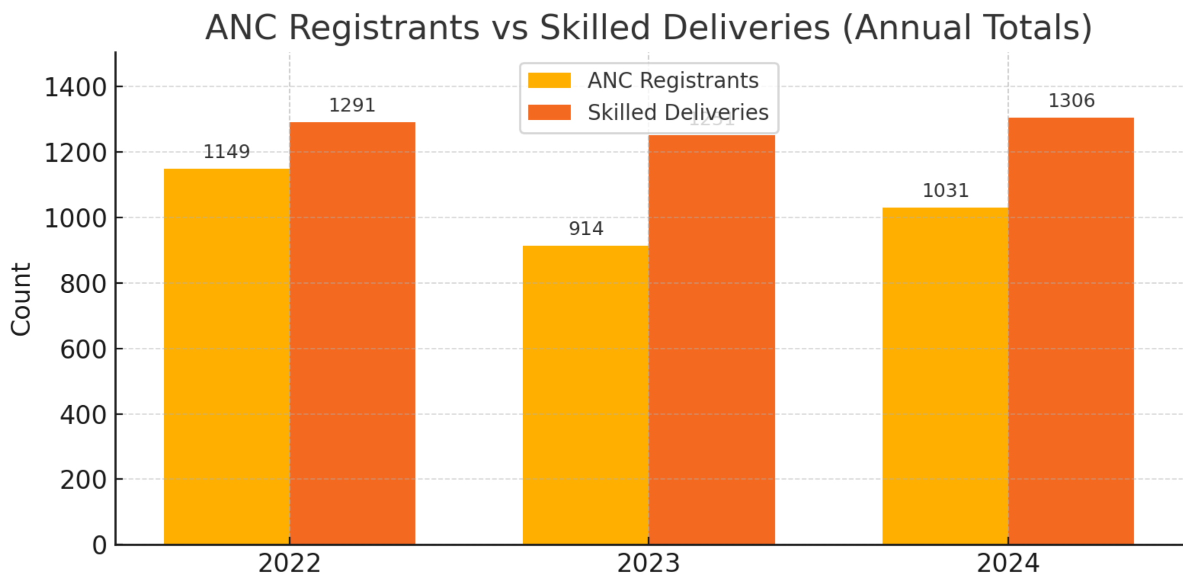

Figure 4.3: ANC Registrants vs Skilled Deliveries (Annual Totals)

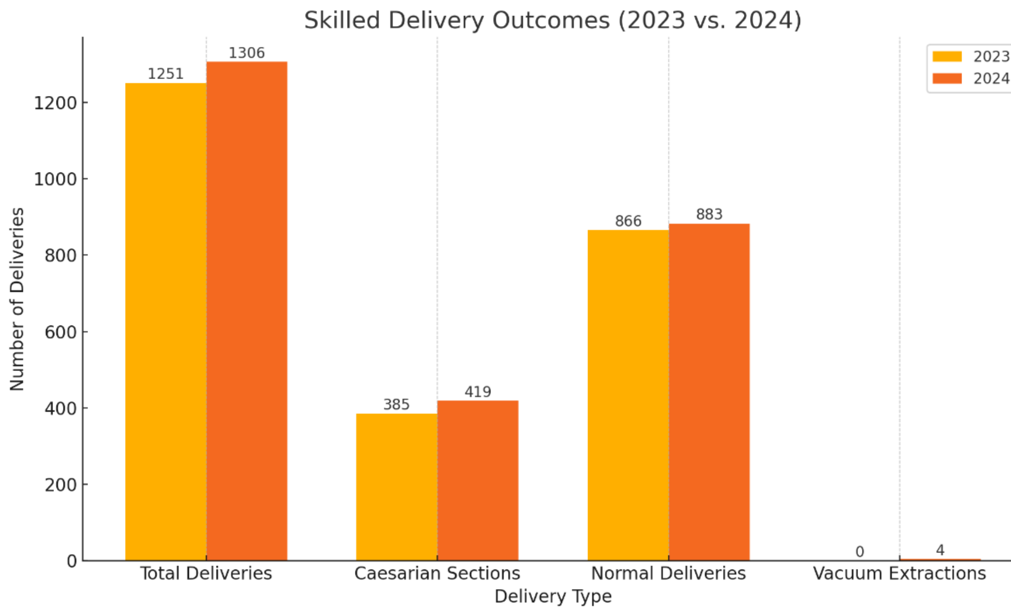

Figure 4.4: Skilled Delivery Outcomes (2023 vs 2024)

4.1.4 Challenges and Recommendations for In-Service Training programs among healthcare workers at Akatsi south municipality.

While the in-service training programs at Akatsi South Municipal Hospital have yielded positive outcomes in maternal and neonatal care, several challenges continue to affect both participation and the translation of knowledge into practice. These constraints were reported by staff and confirmed by hospital records, highlighting systemic, logistical, and operational issues.

Challenges encountered during in-service training programs

Workload and time pressures emerged as the most pressing barriers. More than two-thirds of healthcare workers reported that heavy workload limited their ability to fully participate in training sessions. Training sessions were frequently scheduled during peak service delivery periods, which created conflicts between clinical responsibilities and learning opportunities.

Similarly, time constraints were repeatedly cited as a challenge, reflecting the difficulty of balancing training requirements with the demands of patient care.

Resource limitations also hindered effective training. Staff identified inadequate supplies and insufficient training materials as barriers to practical learning. For example, emergency obstetric drills were constrained by the lack of functional cardiotocography (CTG) machines and limited space in the triage unit, which restricted simulation exercises.

Human resource shortages were consistently highlighted. The hospital operated below the recommended staffing threshold, with only 34 midwives instead of the required 41. This shortage increased the workload of existing staff and contributed to reduced training attendance. Furthermore, staff attrition and inter-facility transfers disrupted continuity, with the loss of trained personnel undermining the sustainability of programs.

Systemic and operational barriers were also evident. Delays in data reporting slowed feedback loops, while resistance to adopting new clinical tools such as the Modified Early Obstetric Warning System (MEOWS) chart was observed among some staff. In addition, Work Improvement Teams (WITs), which were expected to drive continuous improvement, often met irregularly, thereby weakening the follow-up of training outcomes.

Challenges affecting quality of care

Even when training was successfully delivered, structural gaps limited its impact on service delivery. Staff shortages, cited by over 80% of respondents, were the most critical factor undermining quality of care. Other barriers included poor infrastructure, inconsistent availability of medical supplies, and the need for regular refresher training to maintain competence and confidence. These findings emphasize that training alone cannot address systemic weaknesses; rather, it must be integrated into broader health system strengthening.

Recommendations from healthcare workers

Despite these challenges, healthcare workers proposed several practical strategies to improve future in-service training programs. The most frequent recommendations were better scheduling of training sessions (80.6%) and greater emphasis on hands-on practice (80.6%). Participants also suggested more frequent sessions, improved training materials, the introduction of advanced clinical topics, and structured follow-up mentorship to reinforce learning.

With regard to frequency, more than half of participants recommended that refresher training should be conducted quarterly. This aligns with evidence that shorter intervals between training sessions help sustain skill retention and clinical confidence.

Best practices in implementing in-service training programs

Despite the aforementioned challenges, ASMH adopted several innovative and structured approaches that enhanced the effectiveness of its in-service training programs. These best practices ensured that training initiatives were not only implemented successfully but also sustained over time.

Structured and repetitive training models

ASMH institutionalized structured and repetitive training models to build and retain staff competencies. For example, the hospital conducted monthly Helping Babies Breathe (HBB) drills, achieving 100% staff participation in several months, such as October 2023 and October 2024. These scenario-based neonatal resuscitation drills were aligned with six clinical protocols and involved 22–40 staff members consistently practicing these neonatal resuscitation protocols. As a result, there was an improvement in clinical preparedness as well as a dramatic reduction in birth asphyxia rates from 6.8% in 2022 to 2.0% in 2024.

The implementation of a "Train-the-Trainer" approach represented another best practice that facilitated knowledge dissemination and local ownership. During the March 2024 OTIP+MEOWS training initiative, ten champion midwives from key maternal units, including a senior anesthetist, were trained as facility champions. These champions subsequently cascaded knowledge to 31 colleagues, achieving an impressive triage compliance rate of 99% by January 2025. This model ensured rapid knowledge dissemination, maintained continuity of skill acquisition, and fostered local ownership of training initiatives.

Integration of training into routine clinical audits

To ensure that training outcomes translated into clinical improvements, ASMH integrated training into routine quality improvement activities. For instance, a three-member committee was formed in June 2024 to conduct monthly audits on partograph adherence. This approach directly linked training outcomes to clinical performance, increasing partograph compliance rates from 67% in 2022 to 97% in 2024. Additionally, weekly reviews of triage banding accuracy provided real-time feedback, enabling the hospital to identify and address skill gaps promptly and sustain a banding compliance rate of 99%.

Community and multidisciplinary engagement

Community and multidisciplinary engagement strategies further enhanced training effectiveness by creating supportive environments for skill application. Training programs incorporated community sensitization through radio programs, health talks at outpatient department (OPD) and antenatal care (ANC) clinics, and outreach visits that educated the public on maternal health services. This comprehensive approach contributed to increased ANC attendance from 94 in January 2023 to 121 in November 2024 and encouraged earlier facility visits, thereby reducing critical delays in care delivery. Interdepartmental collaboration

during emergency drills ensured seamless responses during actual deliveries, with the maternity ward collaborating effectively with laboratory and pharmacy teams.

Leveraging technology and low-cost solutions

The hospital adopted innovative, low-cost solutions to overcome resource constraints and enhance training accessibility and effectiveness. For example, WhatsApp groups were used by the paediatric ward to discuss convulsion management protocols, facilitating continuous learning beyond formal sessions. Additionally, mobile clinics conducted in sub-municipal zones such as Gefia and Wute provided opportunities for staff to practice skills in diverse settings, reinforcing their competencies and adaptability.

Robust monitoring and evaluation

The establishment of robust monitoring and evaluation systems proved instrumental in maintaining training quality and institutional accountability. ASMH emphasized comprehensive performance monitoring through tools including triage registers, banding logs, audit formats, and MEOWS compliance trackers. Post-training evaluations, such as pre- and post-tests conducted during the March 2024 triage training, helped identify knowledge gaps and informed ongoing capacity building efforts. The Work Improvement Teams (WITs) established across wards, including maternity, OPD, and paediatrics, not only implemented QI projects but also conducted regular data-driven discussions, creating embedded QI approaches that enabled rapid responses to emerging issues. This data-driven approach enabled the hospital to achieve and maintain high compliance rates, such as the 99% banding compliance rate recorded in 2024.

CHAPTER FIVE

5.0 DISCUSSION

5.1 Introduction

This chapter interprets and explains the findings presented in Chapter Four within the context of existing literature and the study objectives. It provides an in-depth analysis of the implications of the results, explores possible explanations for observed outcomes, and discusses their significance for improving the quality of care through in-service training programs.

5.2 Summary of Key findings from this study

The study showed that in-service training programs at Akatsi South Municipal Hospital significantly improved the quality of healthcare, especially in maternal and neonatal services. Key interventions such as Helping Babies Breathe (HBB), obstetric triaging using the Modified Early Obstetric Warning System (MEOWS), and emergency obstetric and newborn care enhanced the skills, confidence, and teamwork of healthcare workers. Over 90% of participants reported improved clinical decision-making and communication. Hospital data confirmed these perceptions, showing a decline in birth asphyxia from (70) 6.8% in 2022 to (25) 2.0% in 2024, a reduction in neonatal deaths from 1 to 0, and no maternal deaths recorded by 2024. Outpatient attendance also improved, reflecting growing patient confidence in hospital services. Despite these achievements, staff shortages, heavy workloads, and limited funding constrained program sustainability. However, hands-on training methods, mentorship, and digital follow-ups through WhatsApp helped sustain learning and reinforce service quality.

5.3 Types of In-Service Training Programs Implemented

The study revealed that healthcare workers at Akatsi South Municipal Hospital participated in a broad range of in-service training programs implemented between 2023 and 2024, the most

prominent being *Helping Babies Breathe (HBB), obstetric triaging and Modified Early Obstetric Warning System (MEOWS), Emergency Obstetric and Newborn Care (EmONC), QualityImprovement (QI) refresher courses,* and *obstetric emergencies management.* The interviews confirmed that over 80% of respondents had participated in HBB and triage training, while hospital records highlighted the integration of monthly HBB drills, cascade training in MEOWS, and regular refresher sessions.

The breadth and frequency of training programs identified in this study are consistent with previous research, which equally underscores the role of in-service training in strengthening clinical competencies in resource-limited settings. For example, Chinbuah *et al.* (2020) documented the national rollout of the "Making Every Baby Count Initiative" (MEBCI), demonstrating that between 2015 and 2017, 3688 health workers across district-level facilities in four regions of Ghana were trained in HBB, Essential Care for Every Baby (ECEB), and infection prevention using a structured "training-of-trainers" model (Chinbuah et al., 2020). Similarly, Brathwaite et al. (2020) evaluated two newborn resuscitation training strategies and found that, across five regional hospitals, 412 providers received HBB and ECEB training, resulting in high pass rates on OSCE assessments and reductions in fresh stillbirth and institutional neonatal mortality in at least one hospital (Brathwaite *et al.*, 2020).

Moreover, these findings from this research reflect global and national trends that highlight the prioritisation of maternal and neonatal survival in training curricula. In this study, practical drills and scenario-driven simulations emerged as the most effective training techniques. This conclusion aligns with the observations of Elendu et al. (2024), who found that hands-on, interactive methods enable health workers to build confidence, enhance their skills, and minimise errors in practice. Their effectiveness is likely due to the chance they provide for learners to actively participate in real-life situations instead of just absorbing information. The scenarios were designed to mirror the local health context in Akatsi South, making them

pertinent and straightforward to implement. Additionally, the small group sizes facilitated participation from all attendees, enabling them to receive immediate feedback and learn collaboratively. These elements contributed to the greater significance and effectiveness of hands-on and simulation-based training when compared to other educational strategies.

Furthermore, the integration of QI refresher courses and outreach-related training at Akatsi reflects a shift toward system-based approaches rather than focusing only on clinical skills. This approach strengthens teamwork, communication, and accountability, helping staff understand how their roles contribute to overall service delivery. Unlike clinical training, which targets individual skills, system-based training builds collective capacity to identify problems, use data for improvement, and sustain change. As a result, it enhances the quality of care by promoting efficiency, patient safety, and consistent performance across departments.

This aligns with the WHO's call for capacity-building programs that address broader dimensions of healthcare quality, including patient flow, communication, and community engagement (WHO, 2016). Thus, the diversity of training programs at Akatsi South Municipal Hospital demonstrates an intentional approach to equipping staff with both technical and systems-based competencies.

5.4 Impact of In-Service Training on Quality-of-Care Indicators

A central finding of this study is the demonstrable improvement in maternal and neonatal health outcomes following the implementation of in-service training programs. The data collected from the key informants showed that over 90% of participants perceived noticeable or significant improvements in areas such as obstetric triaging, newborn resuscitation, teamwork, and partograph use. These subjective perceptions were validated by institutional records that is the annual performance review reports for the years 2023 and 2024 which documented a

reduction in birth asphyxia from (70) 6.8% in 2022 to (25) 2.0% in 2024, elimination of maternal deaths in 2024, and a decline in neonatal deaths from 1 in 2023 to 0 in 2024.

These observed improvements mirror findings from other studies. A cluster randomised trial conducted in 40 hospitals across Ghana by Gomez et al., (2018) found that implementing a low-dose, high-frequency (LDHF) training model led to significant reductions in both newborn mortality and intrapartum stillbirths within one year of implementation. Likewise, Agudelo-Pérez et al. (2022) in a systematic review and meta-analysis found that Helping Babies Breathe (HBB) interventions significantly reduced neonatal mortality (OR = 0.67; 95% CI: 0.57–0.80), intrapartum stillbirths (OR = 0.62; 95% CI: 0.51–0.75), and first-day mortality (OR = 0.70; 95% CI: 0.64–0.77) (Agudelo-Pérez et al., 2022).

Hospital records further corroborated these improvements. Birth asphyxia rates fell from a median of 6.8% to 2.0%, while neonatal deaths dropped from 1 in 2023 to 0 in 2024. Maternal mortality, which stood at one case in 2023, was completely eliminated in 2024. These outcomes are consistent with reports from other low-resource settings in Ghana, where targeted in-service training reduced maternal mortality ratios and improved neonatal survival. For instance, a study by Srofenyoh et al. (2012) at Ridge Regional Hospital in Accra, Ghana, demonstrated that a comprehensive package of obstetric emergency training, triage protocols, and quality improvement initiatives led to a 35% reduction in institutional maternal mortality and a 28% decline in stillbirths over a two-year period (Srofenyoh et al., 2012).

Nevertheless, while most quality indicators improved, antenatal care (ANC) attendance showed mixed trends. Although ANC registrants declined in 2023, there was a subsequent increase in 2024, alongside improved detection of high-risk pregnancies. This suggests that while training enhanced clinical risk assessment, structural barriers such as accessibility or socio-cultural factors may still hinder consistent ANC attendance. Similar findings were reported by Gamberini, Angeli and Ambrosino (2022), in resource-limited settings, where

values, beliefs, traditions, customs and norms, poor resource allocation, were found to hinder higher utilisation of antenatal services (Gamberini, Angeli and Ambrosino, 2022).

This study also highlighted the transformative role of quality improvement (QI) refresher trainings in reinforcing essential skills, ensuring alignment with current best practices, fostering a sustainable QI culture, and improving overall healthcare efficiency and patient outcomes. Such gains affirm the argument by Endalamaw et al. (2024) that embedding QI principles within clinical practice promotes efficiency and strengthens health systems

5.5 Challenges and Best Practices in Implementation of in-service training programs

Despite the clear benefits of in-service training, the study identified persistent challenges that hindered optimal delivery. The most commonly reported barriers were staff shortages, time constraints, heavy workloads, and inadequate resources such as equipment and infrastructure. For instance, the limited number of midwives and shortages of equipment such as CTG machines constrained training participation and practice opportunities. These barriers partially mirror findings from UNFPA-supported training programs in Bhutan and the Lao People's Democratic Republic, where training impact and sustainability were curtailed by resource limitations, policy and regulatory misalignment, and insufficient mentoring and supportive supervision for on-the-job reinforcement (Turkmani et al., 2025).

Nonetheless, the study also identified best practices that facilitated training effectiveness. Structured, repetitive training models such as monthly HBB drills, as well as the integration of training outcomes into routine audits (like partograph reviews and triage compliance checks), also strengthened accountability and ensured continuous skill reinforcement.

Also, the train-the-trainer approach, which flowed knowledge from a small group of champions to other staff, promoted institutional ownership and sustainability. In the Akatsi facility, this model built internal capacity by empowering trained staff to lead and sustain future training

activities, reducing dependence on external facilitators. When staff members are given the responsibility to train their peers, it encourages a sense of shared ownership, accountability, and teamwork. This approach also creates a culture of continuous learning, where staff feel confident to apply and share new skills. Together, these factors strengthen institutional commitment and support the long-term sustainability of quality improvement initiatives. These strategies are aligned with the SafeCare programme experience in Ghana, where embedding QI activities into routine operations produced sustainable improvements (Alhassan et al., 2024).

Furthermore, the creative use of low-cost tools like WhatsApp for continuous learning showed how the team adapted training to local realities and made the most of available resources. WhatsApp made it easier for staff to stay connected, share updates, and discuss challenges as they applied new skills in their daily work. It also allowed trainers to send reminders, give quick feedback, and keep the learning process active long after the formal sessions ended. This ongoing interaction helped reinforce lessons and kept staff engaged, which strengthened the overall impact of the training despite limited resources. This echoes the growing evidence on the utility of mobile health platforms in continuous professional development, particularly in resource-limited contexts (Aryee et al., 2024).

CHAPTER SIX

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

This study set out to evaluate the effectiveness of in-service training programs in improving the quality of healthcare at Akatsi South Municipal Hospital in the Volta Region of Ghana. The evidence gathered demonstrates that in-service training has been instrumental in enhancing both clinical competencies and patient outcomes, particularly in the areas of maternal and neonatal care.

The hospital implemented a broad range of training initiatives, including Helping Babies Breathe (HBB), obstetric triaging with the Modified Early Obstetric Warning System (MEOWS), emergency obstetric and newborn care, quality improvement refresher courses, fetal monitoring workshops, and obstetric emergencies management sessions. Participation was highest in neonatal and obstetric emergency trainings such as Helping Babies Breathe and triage drills, while uptake was comparatively lower for quality improvement and other specialised programs. Training methods relied heavily on participatory approaches, with hands-on drills, workshops, and mixed delivery methods being the most common. Notably, all participants rated training materials such as manuals, job aids, and tools as helpful, which highlights the importance of well-prepared resource materials in adult learning.

Evidence from the study revealed clear improvements in both skills and service delivery following training. Healthcare workers reported increased confidence in clinical decision-making, teamwork, communication, triaging speed, and the use of partographs. Hospital records corroborated these self-reports, demonstrating a reduction in birth asphyxia from 6.8 percent to 2.0 percent, a decline in neonatal deaths from 1 case in 2023 to 0 in 2024, and the

elimination of maternal mortality in 2024. In addition, outpatient attendance rose significantly from approximately 44,700 in 2022 to more than 62,500 in 2024, while antenatal care follow-up and identification of high-risk pregnancies improved. The study also found a statistically significant association between the number of trainings attended and improvements in patient outcomes, which suggests that consistent exposure to in-service training contributes directly to enhanced quality of care.

Despite these gains, several challenges were identified. Human resource shortages, heavy workload, and time constraints limited staff participation in training. Inadequate equipment and infrastructure, coupled with reliance on donor support, posed further barriers to optimal program delivery. Attrition and staff transfers also disrupted the continuity of trained personnel. Nonetheless, the hospital demonstrated resilience by adopting best practices such as repetitive monthly drills, the train-the-trainer cascade model, integration of training outcomes into clinical audits, community engagement through outreach and health talks, and innovative use of digital platforms such as WhatsApp groups. Robust monitoring and evaluation systems further supported the sustainability of improvements.

Ultimately, the study provides strong evidence that structured and participatory in-service training can significantly improve the quality of healthcare. The reductions in neonatal deaths and maternal mortality, alongside better service utilisation, highlight the life-saving potential of such programs. However, sustaining these benefits requires addressing systemic barriers related to staffing, logistics, and financing. The findings affirm that in-service training should be institutionalized as an integral component of hospital operations and health system strengthening in Ghana.

6.2 Recommendations

Based on the findings of this study, the following recommendations are proposed:

1. The Akatsi South Municipal hospital should institutionalise in-service training as a mandatory and routine part of professional development, with clear integration into the hospital and Ghana Health Service operational plans. By embedding regular refresher sessions and structured drills within the hospital's annual training calendar, staff competencies can be sustained and skill attrition minimised.
2. Given that participatory methods such as hands-on drills and simulations were found to be most effective, future training programs should prioritise practical, skills-based approaches over didactic lectures. Training outcomes should also continue to be integrated into quality monitoring systems like clinical audits and supervision, such as routine reviews of partograph completion and triage compliance, in order to reinforce accountability and promote continuous improvement.
3. The persistent staffing shortages and workload pressures that constrained training participation must be addressed at the policy level. The Ghana Health Service should consider strategies such as equitable distribution of healthcare personnel, retention incentives for midwives and neonatal staff, and recruitment of additional staff to ease workload. By ensuring an adequate workforce, healthcare professionals will be better able to balance clinical duties with opportunities for learning and skill development.
4. Resource and logistical constraints should be mitigated through deliberate institutional and governmental support. Hospitals like AKSMH should incorporate training resources and equipment needs into their budgets to reduce reliance on donor support. Additionally, cost-effective innovations such as the use of mobile health platforms for continuous learning should be formally adopted to enhance accessibility.

REFERENCES

Abassah-Buabeng, A. (2016) "Training and its challenges to hospital staff under Ghana health service: a case study of trauma and specialist hospital, Winneba."

Agudelo-Pérez, S., Cifuentes-Serrano, A., Ávila-Celis, P. and Oliveros, H. (2022) "Effect of the helping babies breathe program on newborn outcomes: systematic review and meta-analysis," *Medicina*, 58(11), p. 1567.

AKSMA (2024) *Composite Budget for 2025-2028: Programme Based Budget Estimates for 2025*. Akatsi, Ghana: Akatsi South Municipal Assembly.

Alarjani, N.O., Alharbi, N.H.M. and Alshammari, M.M. (2021) "The Significance of Enhancing Health Workers' Skills and Knowledge in Driving Positive Patient Experiences," *International journal of health sciences*, 5(S1), pp. 1084–1093.

Alhassan, R.K., Antwi, M.A., Sunkwa-Mills, G., Agyei, B.B., de Graaff, A., de Wit, T.F.R. and Nketiah-Amponsah, E. (2024) "Leveraging local health system resources to address quality healthcare gaps in sub-Saharan African: lessons from the SafeCare quality improvement programme in Ghana," *BMC Health Services Research*, 24(1), pp. 1499–1499.

Alhassan, R.K., Ayanore, M.A., Diekuu, J.-B., Prempeh, E.B.A. and Donkor, E.S. (2021) "Leveraging e-Learning technology to enhance pre-service training for healthcare trainees in Ghana: evidence from a pilot project and pointers to policy reforms," *BMC Health Services Research*, 21.

Alhassan, R.K., Nketiah-Amponsah, E. and Arhinful, D.K. (2016) "Design and implementation of community engagement interventions towards healthcare quality improvement in Ghana: a methodological approach," *Health economics review*, 6, pp. 1–13.

Alhassan, R.K., Nketiah-Amponsah, E., Ayanore, M.A., Afaya, A., Salia, S.M., Milipaak, J., Ansah, E.K. and Owusu-Agyei, S. (2019) "Impact of a bottom-up community engagement intervention on maternal and child health services utilization in Ghana: a cluster randomised trial," *BMC public health*, 19, pp. 1–11.

Ali, S.A. and Saad, N.S.-E. (2022) "Effectiveness of In-service Training Program on Nurses' Performance Regarding Patient Safety Practice Standards in Intensive Care Units," *Egyptian Journal of Nursing and Health Sciences*, 3(1), pp. 68–95.

Alkahtani, A.S., Abbas, A.H., Rsheed, A.M. Bin, Alabood, A.F., Alqahtani, A.A., Alkahtani Sr, A.S., RSHEED, A.M.B.I.N., Alabood, A. and Alqahtani, A. (2023) "Assessing the impact of a service excellence program on improving patient experience at primary health care centers," *Cureus*, 15(8).

Al-Worafi, Y.M. (2023) "Simulation in the Distance and Online Pharmacy Practice: Telepharmacy and Telehealth," in *Comprehensive Healthcare Simulation: Pharmacy Education, Practice and Research*. Springer, pp. 189–196.

Amoah, P.A., Nyamekye, K.A. and Owusu-Addo, E. (2021) "A multidimensional study of public satisfaction with the healthcare system: a mixed-method inquiry in Ghana," *BMC Health Services Research*, 21(1), p. 1320.

Arhin, K., Oteng-Abayie, E.F. and Novignon, J. (2023) "Assessing the efficiency of health systems in achieving the universal health coverage goal: evidence from Sub-Saharan Africa," *Health Economics Review*, 13(1), p. 25. Available at: https://doi.org/10.1186/s13561-023-00433-y.

Aryee, G.F.B., Amoadu, M., Obeng, P., Sarkwah, H.N., Malcalm, E., Abraham, S.A., Baah, J.A., Agyare, D.F., Banafo, N.E. and Ogaji, D. (2024) "Effectiveness of eLearning programme for capacity building of healthcare professionals: a systematic review," *Human Resources for Health*, 22(1), p. 60. Available at: https://doi.org/10.1186/s12960-024-00924-x.

Aslan, S.K., Bozkır, G. and Toprak, A.G. (2024) "A Comprehensive Analysis of the Results of The Nursing Orientation Training Program Developed using Kern's Six-Step Approach," *Asian Journal of Nursing Education and Research*, 14(1), pp. 17–24.

Atiga, O., Walters, J. and Pisa, N. (2023) "Challenges of medical commodity availability in public and private health care facilities in the Upper East Region of Ghana: a patient-centered perspective," *BMC health services research*, 23(1), p. 719.

Baernholdt, M., Feldman, M., Davis-Ajami, M.L., Harvey, L.D., Mazmanian, P.E., Mobley, D., Murphy, J.K., Watts, C. and Dow, A. (2019) "An interprofessional quality improvement training program that improves educational and quality outcomes," *American Journal of Medical Quality*, 34(6), pp. 577–584.

Bauhoff, S., Bernal, P., Barraza-Lloréns, M. and Arceo-Schravesande, A. (2025) "Measures of hospital efficiency and quality."

Berwick, D. and Fox, D.M. (2016) "'Evaluating the quality of medical care': Donabedian's classic article 50 years later," *The Milbank Quarterly*, 94(2), p. 237.

Bluestone, J., Ricca, J., Traicoff, D. and Tchoualeu, D.D. (2021) "It's time to move beyond traditional health care worker training approaches," *Global Health: Science and Practice*, 9(3), pp. 431–432.

Bonenberger, M., Aikins, M., Akweongo, P. and Wyss, K. (2014) "The effects of health worker motivation and job satisfaction on turnover intention in Ghana: a cross-sectional study," *Human resources for health*, 12, pp. 1–12.

Brantuo, M.N., Cristofalo, E., Meheš, M.M., Ameh, J., Brako, N.O., Boahene, F., Adjei, S.B., Opoku, E., Banda, H. and Wang, Y.T. (2014) "Evidence-based training and mentorship combined with enhanced outcomes surveillance to address the leading causes of neonatal mortality at the district hospital level in G hana," *Tropical Medicine & International Health*, 19(4), pp. 417–426.

Brathwaite, K.P., Bryce, F., Moyer, L.B., Engmann, C., Twum-Danso, N.A., Kamath-Rayne, B.D., Srofenyoh, E.K., Ucer, S., Boadu, R.O. and Owen, M.D. (2020) "Evaluation of two newborn resuscitation training strategies in regional hospitals in Ghana," *Resuscitation Plus*, 1, p. 100001.

Bresick, G., Christians, F., Makwero, M., Besigye, I., Malope, S. and Dullie, L. (2019) "Primary health care performance: a scoping review of the current state of measurement in Africa," *BMJ Global Health*, 4(Suppl 8), p. e001496.

Campbell, J., Sochas, L., Cometto, G. and Matthews, Z. (2016) "Evidence for action on improving the maternal and newborn health workforce: the basis for quality care," *International Journal of Gynecology & Obstetrics*, 132(1), pp. 126–129.

Chaghari, M., Saffari, M., Ebadi, A. and Ameryoun, A. (2017) "Empowering education: A new model for in-service training of nursing staff," *Journal of advances in medical education & professionalism*, 5(1), p. 26.

Chinbuah, M.A., Taylor, M., Serpa, M., Mazia, G., Cofie, P.K., Kwarah, W., Dawson, S., Nelson, B.D. and Engmann, C. (2020) "Scaling up Ghana's national newborn care initiative: integrating 'helping babies breathe' (HBB), 'essential care for every baby' (ECEB), and newborn 'infection prevention' (IP) trainings," *BMC Health Services Research*, 20(1), p. 739. Available at: https://doi.org/10.1186/s12913-020-05225-2.

Choopani, A., Arabloo, J., Arkian, S.H. and Vatankhah, S. (2024) "Identification of the contextual factors influencing the successful implementation of in-service training policies for the health workforce in Iran," *BMC Medical Education*, 24(1), p. 1365.

Creswell, J.W. and Clark, V.L.P. (2017) *Designing and conducting mixed methods research*. Sage publications.

Cunningham, F.C., Ferguson-Hill, S., Matthews, V. and Bailie, R. (2016) "Leveraging quality improvement through use of the Systems Assessment Tool in Indigenous primary health care services: a mixed methods study," *BMC health services research*, 16, pp. 1–11.

Dei Cas, A., Aldigeri, R., Ridolfi, V., Vazzana, A., Ciardullo, A.V., Manicardi, V., Sforza, A., Tomasi, F., Zavaroni, D. and Zavaroni, I. (2023) "Efficacy of a training programme for the management of diabetes mellitus in the hospital: A randomized study (stage 2 of GOVEPAZ healthcare)," *Diabetes/Metabolism Research and Reviews*, 39(8), p. e3708.

Deorari, A.K., Kumar, P., Chawla, D., Thukral, A., Goel, S., Bajaj, R., Singh, M., Gilbert, C. and Shukla, R. (2022) "Improving the quality of health care in special neonatal care units of India: a before and after intervention study," *Global Health: Science and Practice*, 10(5).

Doku, A.K., Tetteh, J., Edzeame, J., Peters, R.J., Agyemang, C., Otchi, E.H. and Yawson, A.E. (2024) "The Ghana heart initiative–a health system strengthening approach as index intervention model to solving Ghana's cardiovascular disease burden," *Frontiers in Public Health*, 12, p. 1330708.

Al Dweik, R., Ajaj, R., Kotb, R., Halabi, D. El, Sadier, N.S., Sarsour, H. and Elhadi, Y.A.M. (2024) "Opportunities and challenges in leveraging digital technology for mental health system strengthening: a systematic review to inform interventions in the United Arab Emirates," *BMC Public Health*, 24(1), p. 2592.

Elendu, C., Amaechi, D.C., Okatta, A.U., Amaechi, E.C., Elendu, T.C., Ezeh, C.P. and Elendu, I.D. (2024) "The impact of simulation-based training in medical education: A review," *Medicine*, 103(27), p. e38813.

Elgazzar, S.E., Elkashif, M.M.L., Eltahry, S.I., Ibrahim, A.M. and Shahin, M.A.H. (2024) "Effect of structured in-service training on nurses' knowledge, practice, and self-confidence regarding patients' colostomy care," *Texto & Contexto-Enfermagem*, 33, pp. e20240072–e20240072.

Endalamaw, A., Khatri, R.B., Mengistu, T.S., Erku, D., Wolka, E., Zewdie, A. and Assefa, Y. (2024) “A scoping review of continuous quality improvement in healthcare system: conceptualization, models and tools, barriers and facilitators, and impact,” *BMC Health Services Research*, 24(1), p. 487. Available at: https://doi.org/10.1186/s12913-024-10828-0.

Gamberini, C., Angeli, F. and Ambrosino, E. (2022) “Exploring solutions to improve antenatal care in resource-limited settings: an expert consultation,” *BMC Pregnancy and Childbirth*, 22(1), p. 449. Available at: https://doi.org/10.1186/s12884-022-04778-w.

Ghag, K., Bahl, R., Winter, C., Lynch, M., Bautista, N., Ilagan, R., Ellis, M., de Salis, I. and Draycott, T.J. (2021) “Key components influencing the sustainability of a multi-professional obstetric emergencies training programme in a middle-income setting: a qualitative study,” *BMC Health Services Research*, 21, pp. 1–11.

Ghana News Agency (2024) “Teenage pregnancy: Akatsi South among top three in Volta under 2024 half-year review,” 6 September. Available at: https://gna.org.gh/2024/09/teenage-pregnancy-akatsi-south-among-top-three-in-volta-under-2024-half-year-review/.

Gomaa Mahmoud, A.M., Mohmed, M.A., Ibrahiem, A.M. and Ahmed, G.H. (2020) “Effect of In-service Training Program on Nurses’ Performance Regarding Patients with Whipple Surgery,” *Assiut Scientific Nursing Journal*, 8(23), pp. 106–112.

Gomez, P.P., Nelson, A.R., Asiedu, A., Addo, E., Agbodza, D., Allen, C., Appiagyei, M., Bannerman, C., Darko, P. and Duodu, J. (2018) “Accelerating newborn survival in Ghana through a low-dose, high-frequency health worker training approach: a cluster randomized trial,” *BMC pregnancy and childbirth*, 18(1), p. 72.

Gracía-Pérez, M.L. and Gil-Lacruz, M. (2018) “The impact of a continuing training program on the perceived improvement in quality of health care delivered by health care professionals,” *Evaluation and Program Planning*, 66, pp. 33–38. Available at: https://doi.org/10.1016/j.evalprogplan.2017.09.009.

GSS (2021) *Akatsi South District Assembly*.

Guta, N.M. (2022) “Application of Donabedian quality-of-care framework to assess quality of neonatal resuscitation, its outcome, and associated factors among resuscitated newborns at public hospitals of East Wollega zone, Oromia, Western Ethiopia, 2021,” *BMC pediatrics*, 22(1), p. 605.

Howden-Chapman, P., Siri, J., Chisholm, E., Chapman, R., Doll, C.N. and Capon, A. (2017) “SDG 3: Ensure healthy lives and promote wellbeing for all at all ages,” *A guide to SDG interactions: from science to implementation. Paris, France: International Council for Science*, pp. 81–126.

Josiah, B.O., Enebeli, E.C., Duncan, B.A., Anukam, L.U., Akingbade, O., Ncube, F., Josiah, C.C., Alimele, E.K., Otoboyor, N.L., Josiah, O.G., Mukoro, J.U., Nganwuchu, B.C., Opeyemi, F.I., Olaosebikan, T.W. and Kantaris, M. (2024) “Perceptions of healthcare finance and system quality among Nigerian healthcare workers.,” *PLOS global public health*, 4(11), p. e0003881. Available at: https://doi.org/10.1371/journal.pgph.0003881.

Juma, D., Stordal, K., Kamala, B., Bishanga, D.R., Kalolo, A., Moshiro, R., Kvaløy, J.T. and Manongi, R. (2024) "Readiness to provide comprehensive emergency obstetric and neonatal care: a cross-sectional study in 30 health facilities in Tanzania," *BMC Health Services Research*, 24(1), p. 870. Available at: https://doi.org/10.1186/s12913-024-11317-0.

Kabene, S.M., Orchard, C., Howard, J.M., Soriano, M.A. and Leduc, R. (2006) "The importance of human resources management in health care: a global context," *Human resources for health*, 4, pp. 1–17.

Kiguli-Malwadde, E., Forster, M., Martin, S., Chilemba, E., Couper, I., Motlhatlhedi, K., Celentano, J., Haruzivishe, C., Sears, D. and Budak, J.Z. (2022) "Evaluating the impact of a multicountry interprofessional training programme to improve HIV knowledge and clinical confidence among healthcare workers in sub-Saharan Africa: a cohort study," *BMJ open*, 12(7), p. e060079.

King, R., Taylor, B., Talpur, A., Jackson, C., Manley, K., Ashby, N., Tod, A., Ryan, T., Wood, E. and Senek, M. (2021) "Factors that optimise the impact of continuing professional development in nursing: A rapid evidence review," *Nurse education today*, 98, p. 104652.

Kirkman, M.A., Sevdalis, N., Arora, S., Baker, P., Vincent, C. and Ahmed, M. (2015) "The outcomes of recent patient safety education interventions for trainee physicians and medical students: a systematic review," *BMJ open*, 5(5), p. e007705.

Kruk, M.E., Gage, A.D., Arsenault, C., Jordan, K., Leslie, H.H., Roder-DeWan, S., Adeyi, O., Barker, P., Daelmans, B. and Doubova, S.V. (2018) "High-quality health systems in the Sustainable Development Goals era: time for a revolution," *The Lancet global health*, 6(11), pp. e1196–e1252.

Kumah, E., Amponsah, J.-M., Owusu Adoma, P., Boakye, D.S., Boateng, R., Owusu-Aduomi Botchwey, C. and Afari Baidoo, M. (2024) "Turnover intention and associated factors among health workers in Christian Health Association of Ghana hospitals: An institution-based cross-sectional study," *International Journal of Healthcare Management*, pp. 1–9.

Kumari, V. (2022) "In–Service Nursing Education in India: Challenges and Intervention," *ECS Transactions*, 107(1), p. 9497.

Leslie, H.H., Gage, A., Nsona, H., Hirschhorn, L.R. and Kruk, M.E. (2016) "Training and supervision did not meaningfully improve quality of care for pregnant women or sick children in sub-Saharan Africa," *Health Affairs*, 35(9), pp. 1716–1724.

Loignon, C., Hudon, C., Goulet, É., Boyer, S., De Laat, M., Fournier, N., Grabovschi, C. and Bush, P. (2015) "Perceived barriers to healthcare for persons living in poverty in Quebec, Canada: the EQUIhealThY project," *International journal for equity in health*, 14, pp. 1–11.

Lozano, R., Fullman, N., Mumford, J.E., Knight, M., Barthelemy, C.M., Abbafati, C., Abbastabar, H., Abd-Allah, F., Abdollahi, M. and Abedi, A. (2020) "Measuring universal health coverage based on an index of effective coverage of health services in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019," *The Lancet*, 396(10258), pp. 1250–1284.

McCullough, K., Andrew, L., Genoni, A., Dunham, M., Whitehead, L. and Porock, D. (2023) "An examination of primary health care nursing service evaluation using the Donabedian model: A systematic review," *Research in nursing & health*, 46(1), pp. 159–176.

Mehdi, Z., Nasser, R., Theobald, H. and Schoemann, K. (2019) "Health workers' educational training and staffing concerning medication errors, fall injuries, and complaints among older adults," *Global journal of health science*, 11(3), pp. 111–121.

Mishra, S., Rotarou, E.S., Peterson, C.B., Sakellariou, D. and Muscat, N.A. (2023) "The WHO European framework for action to achieve the highest attainable standard of health for persons with disabilities 2022–2030," *The Lancet Regional Health–Europe*, 25.

Modern Ghana (2023) "Poor infrastructure led to closure of Akatsi Municipal Hospital due to safety concerns raised by nurses and midwives." Available at: https://www.modernghana.com/news/1229946/poor-infrastructure-led-to-closure-of-akatsi-munic.html.

Morton, S., Pencheon, D. and Squires, N. (2017) "Sustainable Development Goals (SDGs), and their implementation: A national global framework for health, development and equity needs a systems approach at every level," *British medical bulletin*, 124(1), pp. 81–90.

Munneke, W., Demoulin, C., Nijs, J., Morin, C., Kool, E., Berquin, A., Meeus, M. and Kooning, M. (2023) "Development of an interdisciplinary training program about chronic pain management for healthcare professionals: part of an effectiveness-implementation study."

Mutshatshi, T.E., Mothiba, T.M. and Malema, R.N. (2022) "Exploration of in-service training needs for nurses implementing the nursing process at regional hospitals of Limpopo Province, South Africa," *The Open Public Health Journal*, 15(1).

Nakamura, K., Siongco, K.L.L., Moncatar, T.J.R.T., Tejero, L.M.S., De La Vega, S.A.F., Bonito, S.R., Javier, R., Tsutsui, T., Tri Han, T.D. and Vo, M.T.H. (2022) "In-service training programme for health and social care workers in the Philippines to strengthen interprofessional collaboration in caring for older adults: a mixed-methods study," *Health Research Policy and Systems*, 20(Suppl 1), p. 111.

Nicol, E., Turawa, E. and Bonsu, G. (2019) "Pre-and in-service training of health care workers on immunization data management in LMICs: a scoping review," *Human resources for health*, 17, pp. 1–14.

Nkrumah, J. and Abekah-Nkrumah, G. (2019) "Facilitators and barriers of patient-centered care at the organizational-level: a study of three district hospitals in the central region of Ghana," *BMC Health Services Research*, 19, pp. 1–11.

Olubodun, T., Rahman, S.A., Odukoya, O.O., Okafor, I.P. and Balogun, M.R. (2023) "Determinants of health facility delivery among young mothers aged 15 – 24 years in Nigeria: a multilevel analysis of the 2018 Nigeria demographic and health survey," *BMC Pregnancy and Childbirth*, 23(1), p. 185. Available at: https://doi.org/10.1186/s12884-023-05492-x.

Opiyo, N. and English, M. (2015) "In-service training for health professionals to improve care of seriously ill newborns and children in low-income countries," *Cochrane Database of Systematic Reviews* [Preprint], (5).

Panteli, D., Quentin, W. and Busse, R. (2019) “Understanding healthcare quality strategies: a five-lens framework,” *Improving healthcare quality in Europe*, p. 19.

Purwadhi, P., Widjaja, Y.R., Dimyati, F. and Sandi, G.P. (2025) “Exploring New Methods for Measuring Hospital Performance and Quality of Care for More Effective Strategic Planning: A Systematic Review,” *AKADEMIK: Jurnal Mahasiswa Ekonomi & Bisnis*, 5(1), pp. 477–492.

Quentin, W., Partanen, V.-M., Brownwood, I. and Klazinga, N. (2019) “Measuring healthcare quality,” *Improving healthcare quality in Europe*, p. 31.

Reis, T., Faria, I., Serra, H. and Xavier, M. (2022) “Barriers and facilitators to implementing a continuing medical education intervention in a primary health care setting,” *BMC health services research*, 22(1), p. 638.

Ross, A.J., Anderson, J.E., Kodate, N., Thomas, L., Thompson, K., Thomas, B., Key, S., Jensen, H., Schiff, R. and Jaye, P. (2013a) “Simulation training for improving the quality of care for older people: an independent evaluation of an innovative programme for inter-professional education,” *BMJ quality & safety*, 22(6), pp. 495–505.

Ross, A.J., Anderson, J.E., Kodate, N., Thomas, L., Thompson, K., Thomas, B., Key, S., Jensen, H., Schiff, R. and Jaye, P. (2013b) “Simulation training for improving the quality of care for older people: an independent evaluation of an innovative programme for inter-professional education,” *BMJ quality & safety*, 22(6), pp. 495–505.

Sajjadnia, Z., Sadeghi, A., Kavosi, Z., Zamani, M. and Ravangard, R. (2015) “Factors affecting the nurses’ motivation for participating in the in-service training courses: A case study,” *Health Management & Information Science*, 2(1), pp. 21–26.

Samuel, A., Cervero, R.M., Durning, S.J. and Maggio, L.A. (2021) “Effect of continuing professional development on health professionals’ performance and patient outcomes: a scoping review of knowledge syntheses,” *Academic Medicine*, 96(6), pp. 913–923.

Sebastian, S., Thomas, D.P., Brimblecombe, J., Arley, B. and Cunningham, F.C. (2022) “Perceived impact of the characteristics of the Indigenous Queensland B. strong brief intervention training program on uptake and implementation,” *Health Promotion Journal of Australia*, 33(1), pp. 245–256.

Setia, M.S. (2016) “Methodology series module 3: Cross-sectional studies,” *Indian journal of dermatology*, 61(3), pp. 261–264.

Shahnazi, H., Araban, M., Karimy, M., Basiri, M., Ghazvini, A. and Stein, L.A.R. (2021) “A quasi-experimental study to improve health service quality: implementing communication and self-efficacy skills training to primary healthcare workers in two counties in Iran,” *BMC Medical Education*, 21, pp. 1–9.

Al Shamari, D. (2022) “Challenges and barriers to e-learning experienced by trainers and training coordinators in the Ministry of Health in Saudi Arabia during the COVID-19 crisis,” *PLoS one*, 17(10), p. e0274816.

Srofenyoh, E., Ivester, T., Engmann, C., Olufolabi, A., Bookman, L. and Owen, M. (2012) “Advancing obstetric and neonatal care in a regional hospital in Ghana via continuous

quality improvement," *International Journal of Gynecology & Obstetrics*, 116(1), pp. 17–21.

Tawiah, P.A., Emmanuel, B.A., Paul, O., Adu-Fosu, G. and Ashinyo, M.E. (2024) "Predictors of Turnover Intention Among Health Workers in the Greater Accra Region, Ghana: A Cross-Sectional Study," *Ghana: A Cross-Sectional Study* [Preprint].

Tenkorang-Twum, D., Atibila, F. and Gyapong, P. (2024) "Examination of Patient Safety and Experience in Ghanaian Healthcare Facilities," *Ghana Journal of Nursing and Midwifery*, 1(2), pp. 21–30.

Thu, N.T.H., McDonald, F., Witter, S., Anh, B.T.M. and Wilson, A. (2023) "In-service Training of Maternal Health Workers in Rural Areas in Vietnam: Is it Relevant, Timely and Effective? A Mixed-method Study," *Journal of Health Management*, 25(3), pp. 553–562.

Turkmani, S., Blackburn, K., Breen-Kamkong, C., Tshering, K., Choden, K., Chalernphon, A., Vilivong, K., Smith, R. and Homer, C. (2025) "Improving quality of maternal and newborn care: An evaluation of enablers and barriers in implementing emergency obstetric and newborn care training in Bhutan and Lao People's Democratic Republic," *PLOS Global Public Health*, 5(6), p. e0004584.

Ünal, R. and Yilmaz, M.B. (2024) "Accepting video conferencing technology as an in-service training tool for health professionals," *Education and Information Technologies*, 29(16), pp. 21217–21239.

UN-OCHA (2024) "Kobo Toolbox | HumanitarianResponse." Available at: https://www.humanitarianresponse.info/en/applications/kobotoolbox.

WHO (2006) *Quality of Care: A Process for Making Strategic Choices in Health Systems*. Geneva, Switzerland: World Health Organization.

WHO (2016) *Standards for improving quality of maternal and newborn care in health facilities*. Geneva: World Health Organization. Available at: https://iris.who.int/bitstream/handle/10665/249155/9789241511216-eng.pdf?sequence=1.

WHO (2020) *Quality Health Services: A Planning Guide*. Geneva, Switzerland: World Health Organization.

WHO (2023) *Technical Efficiency of Health Systems in the WHO African Region*. World Health Organization. Regional Office for Africa. Available at: https://iris.who.int/handle/10665/371012.

WHO (2024) *Data, Ghana Health Data Overview for the Republic of Ghana*. Geneva, Switzerland: World Health Organization. Available at: https://data.who.int/countries/288.

WHO (2025a) *African region's maternal and newborn mortality declining, but progress still slow*. Brazzaville: World Health Organization, Regional Office for Africa. Available at: https://www.afro.who.int/news/african-regions-maternal-and-newborn-mortality-declining-progress-still-slow.

WHO (2025b) *Quality Health Services*. Geneva, Switzerland: World Health Organization. Available at: https://www.who.int/news-room/fact-sheets/detail/quality-health-services.

Wolderslund, M., Waidtløw, K., Kofoed, P.-E. and Ammentorp, J. (2022) "Facilitators and barriers to an organisation-based communication skills training program: an interview study."

World Health Organization (2006) "Quality of care : a process for making strategic choices in health systems." Available at: https://iris.who.int/handle/10665/43470.

Yang, J., Liu, F., Yang, C., Wei, J., Ma, Y., Xu, L., Xie, J. and Wang, J. (2025) "Application of Donabedian Three-Dimensional Model in Outpatient Care Quality: A Scoping Review," *Journal of Nursing Management*, 2025(1), p. 6893336.

APPENDICES

APPENDIX I – INFORMED CONSENT FORM

CONSENT FORM (for healthcare professionals aged 18 and above)

Title of Study: Improving Quality of Care Through In-Service Training At Akatsi South Municipal Hospital, Volta Region, Ghana: An Evaluation Study

Introduction:

You are invited to participate in a research study conducted by Iris Dzifa Adzah from Ensign Global University. The purpose of this study is to evaluate the effectiveness of in-service training programs in enhancing the quality of healthcare delivery at Akatsi South Municipal Hospital. Your participation is entirely voluntary, and you may withdraw at any point without any negative consequences.

Purpose of the Study:

The study aims to:

1. Identify the types of in-service training programs implemented for healthcare workers at Akatsi South Municipal Hospital.
2. Assess the impact of in-service training programs on key quality of care indicators.
3. Identify challenges and best practices in the implementation of these training programs.

Procedures:

If you agree to participate, you will be asked to respond to a semi-structured questionnaire administered through a face-to-face interview using the KoboCollect digital platform. The questionnaire will cover topics including training participation, perceived impact on service quality, and encountered challenges. The session will take approximately 30 minutes and will be conducted in a private and professional setting within the hospital premises.

Potential Risks and Discomforts:

There are no anticipated risks associated with participation. However, should any question cause discomfort, you may decline to answer or withdraw at any time.

Potential Benefits:

Although you may not receive direct personal benefits, your participation will contribute valuable insights toward improving training interventions and overall quality of healthcare services at the facility.

Confidentiality:

All responses will be kept strictly confidential. No personally identifying information will be collected or published. Data will be securely stored and used solely for academic purposes. Results will be reported in aggregate form to ensure anonymity.

Voluntary Participation and Withdrawal:

Your participation in this study is completely voluntary. You are free to decline or withdraw at any stage without any penalty or effect on your employment or professional standing.

Compensation:

There is no financial compensation for participating. However, your input is vital and highly appreciated.

Questions and Contacts:

If you have any questions about this study or your rights as a participant, please contact:

Principal Researcher:

Iris Dzifa Adzah

Ensign Global University, Kpong

P. O. Box AK 136, Akosombo

Eastern Region, Ghana

This study has been reviewed and approved by the Institutional Review Board (IRB) of Ensign Global University. For concerns regarding your rights as a participant, you may contact the IRB office at 0245762229 or registrar@ensign.edu.gh during business hours (8:00 am–5:00 pm).

Statement of Consent:

I have read and understood the information provided above. I have had the opportunity to ask questions, and I voluntarily agree to participate in this study.

Participant's Name: ___________________________ Date: __________________

Participant's Signature: ________________________

Researcher's Signature: _______________________ Date: __________________

APPENDIX II – QUESTIONNAIRE

IMPROVING QUALITY OF CARE THROUGH IN-SERVICE TRAINING AT AKATSI SOUTH MUNICIPAL HOSPITAL, VOLTA REGION, GHANA: AN EVALUATION STUDY

Questionnaire ID: ____________
Date: ____________

INTRODUCTION:

Dear Participant,

Thank you for agreeing to participate in this study. The purpose of this questionnaire is to evaluate the effectiveness of in-service training programs in improving the quality of healthcare service delivery at Akatsi South Municipal Hospital. Your responses will remain confidential and will be used solely for research purposes. The survey should take approximately 10-15 minutes to complete.

SECTION A: DEMOGRAPHIC INFORMATION

1. **Age**:
    - o 20–29 years
    - o 30–39 years
    - o 40–49 years
    - o 50+ years
2. **Gender**:
    - o Male
    - o Female
3. **Professional Category**:
    - o Doctor
    - o Nurse
    - o Midwife
    - o Pharmacist
    - o Laboratory Technician
    - o Other: _______________
4. **Years of Working at This Facility**:
    - o 6 months–1 year
    - o 2–5 years
    - o 6–10 years
    - o 10+ years

5. **Highest Educational Qualification**:
   - Certificate
   - Diploma
   - Bachelor's Degree/Medical Degree
   - Master's Degree
   - Other: _______________

Kindly specify other educational qualification______________________

SECTION B: TRAINING PARTICIPATION

6. **Number of In-Service Trainings Attended**:
   - None
   - 1–2
   - 3–4
   - 5+
7. **Types of Training Programs Attended** *(Select all)*:
   - Helping Baby Breath drills
   - Emergency obstetric and Newborn care (EmONC)
   - Quality improvement methods
   - Obstetric triaging
   - Other (please specify): _______________

Kindly specify other types of training programs______________________

8. **Primary Organizer of Training**:
   - Ghana Health Service
   - Hospital management
   - NGOs/Partners
   - Professional associations
   - Other: _______________

Kindly specify other organizers of training programs______________________

9. **Average Duration of Training**:
   - <1 day
   - 1–3 days
   - 4–7 days

- >1 week

10. **Training Delivery Method**:

- Lectures
- Workshops
- Practical demonstrations/Drills
- Online
- Mixed methods

Section C: Pre-Training & Practices *(Baseline Assessment)*

11.Before the training, how would you rate your confidence in:

(1 = Very Low, 2 = Low, 3 = Moderate, 4 = High, 5 = Very High)

Please circle or select one number for each item.

Statement	1	2	3	4	5
a. Performing obstetric triaging	☐	☐	☐	☐	☐
b. Conducting Helping Babies Breathe (HBB) drills	☐	☐	☐	☐	☐
c. Managing emergency obstetric and newborn cases	☐	☐	☐	☐	☐
d. Applying quality improvement (QI) methods in your work	☐	☐	☐	☐	☐

12.What were the biggest challenges you faced in maternal and newborn care before the training? *(Check all that apply)*

- ☐ Lack of skills/knowledge
- ☐ Inadequate equipment/supplies
- ☐ High patient load
- ☐ Poor referral systems
- ☐ Other (Specify): _______

Kindly specify other challenges_______________________

SECTION D: TRAINING PROGRAM EVALUATION

13.How effective were the trainings in improving your skills?

(1 = Not Effective, 2 = Slightly Effective, 3 = Moderately Effective, 4 = Effective, 5 = Very Effective)

Please circle or select one number for each item.

Statement	1	2	3	4	5
a. Obstetric triaging	☐	☐	☐	☐	☐
b. Helping Babies Breathe (HBB)	☐	☐	☐	☐	☐
c. Emergency obstetric and newborn care	☐	☐	☐	☐	☐
d. Quality improvement methods	☐	☐	☐	☐	☐

14.What training methods were most useful?

- ☐ Lectures
- ☐ Hands-on drills
- ☐ Simulations
- ☐ Case studies
- ☐ Group discussions

15.Were the training materials (manuals, tools, job aids) helpful?

☐ Yes

☐ No

15b. *If no, why?* ______

SECTION E: POST-TRAINING IMPACT ON QUALITY OF CARE

16. Since the training, have you observed improvements in the following areas?
(Please rate each item from 1 to 5)

(1 = No Improvement, 2 = Slight Improvement, 3 = Moderate Improvement, 4 = Noticeable Improvement, 5 = Significant Improvement)

Area of Improvement	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
Speed and accuracy of obstetric triaging	☐	☐	☐	☐	☐
Newborn resuscitation success rates	☐	☐	☐	☐	☐
Management of obstetric and newborn emergencies	☐	☐	☐	☐	☐
Use of QI methods (e.g., checklists, audits)	☐	☐	☐	☐	☐
Confidence in clinical decision-making	☐	☐	☐	☐	☐
Teamwork and communication	☐	☐	☐	☐	☐

Partograph usage during labour	☐	☐	☐	☐	☐
Service delivery at your unit	☐	☐	☐	☐	☐
Patient outcomes (e.g., maternal or newborn recovery/survival)	☐	☐	☐	☐	☐

17.What is the Overall Impact of these trainings on the Quality of healthcare?

- Very Poor
- Poor
- Fair
- Good
- Excellent

18.What remaining challenges affect quality care despite the training?

- ☐ Lack of supplies
- ☐ Staff shortages
- ☐ Poor infrastructure
- ☐ Need for refresher training
- ☐ Other: ______

Kindly specify other remaining challenges_______________________

SECTION F: KNOWLEDGE CHECK ON HELPING BABIES BREATHE

19.What should you do in The Golden Minute?

- Bathe the baby
- Deliver the placenta
- Evaluate the heart rate
- Help a baby breathe if necessary

20. To prepare for a birth

- You identify a helper and review the emergency plan
- You ask everyone but the mother to leave the area
- You prepare equipment only when you need it

- You do not need a helper

21. To prepare the area for delivery

- Open all the doors and windows to get fresh air
- Darken the room
- Make sure the area is clean, warm, and well-lighted
- Keep the room temperature cold

22. What should you do to keep the baby warm?

- Open all the windows
- Give the baby a bath after birth
- Place hot water bottles next to the baby's skin
- Place the baby skin-to-skin with mother

23. What should you do to keep the baby clean?

- Wash your hands before touching the baby and help mother wash her hands before breastfeeding
- Reuse the suction device before cleaning
- Keep the umbilical cord tightly covered
- Do not touch the baby

24. Which baby can receive routine care after birth?

- A baby who is not breathing
- A baby who is gasping
- A baby who is crying and/or breathing well
- A baby who is limp

25. Routine care for a healthy baby at birth includes

- Drying, removing the wet cloth, and bathing the baby
- Drying, removing the wet cloth, and positioning the baby skin-to-skin
- Bathing and putting clean clothes on the baby
- Drying and wrapping the baby in the wet cloth

26. When should the umbilical cord be clamped or tied and cut during routine care?

- After the placenta is delivered
- Around 1-3 minutes after birth
- Immediately after the baby is born
- Before a baby has cried

27. A baby is quiet, limp and not breathing at birth. What should you do?

- Dry the baby thoroughly
- Shake the baby
- Throw cold water on the face
- Hold the baby upside down

28. A newborn baby is quiet, limp and not crying. The baby does not respond to steps to stimulate breathing. What should you do next?

- Slap the baby's back
- Hold the baby upside down
- Squeeze the baby's ribs
- Begin ventilation

29. In which situation should a baby be suctioned?

- When a baby is crying at birth
- When a baby is crying but there is meconium in the amniotic fluid
- When you see secretions blocking the mouth and nose
- Before drying the baby

30. Suctioning a baby unnecessarily or frequently can

- Cause a baby to stop breathing
- Make a baby start coughing and breathing
- Stimulate a baby to cry
- Increase the baby's heart rate

31. Which of the following statements about ventilation with bag and mask is TRUE?

- The mask should cover the eyes
- Air should escape between the mask and face
- Squeeze the bag to produce gentle movement of the chest
- Squeeze the bag to give 80 to 100 breaths per minute

32. A baby's chest is not moving with bag and mask ventilation. What should you do?

- Stop ventilation
- Reapply the mask to get a better seal
- Slap the baby's back
- Give medicine to the baby

33. You can stop ventilation if

- A baby is blue and limp
- A baby's heart rate is slow
- A baby's heart rate is normal and the chest is not moving
- A baby's heart rate is normal and the baby is breathing or crying

34. A newborn baby's heart rate should be:

- Faster than your heart rate
- Slower than your heart rate
- Checked before drying the baby
- Checked only when the baby is crying

35. A baby who received ventilation

- Needs continued observation with mother
- Cannot be fed
- Always needs advanced care
- Should immediately receive antibiotics

36. When should the bag and mask and suction device be disinfected?

- After every use
- Only when they appear dirty
- Weekly
- Once a month

SECTION G: CHALLENGES & RECOMMENDATIONS FOR IN-SERVICE TRAINING

37.What were some of the Challenges faced during the training *(Select all that apply)*:

- Time constraints
- Heavy workload
- Inadequate resources

- Language barriers
- Complex content
- Limited practical sessions
- Other: _______________

Kindly specify other challenges______________________

38.What recommendations would you make to enhance future in-service training programs? (select all that apply)

- More frequent sessions
- Better scheduling
- More hands-on practice
- Advanced topics
- Improved training materials
- Follow-up mentorship
- Other: _______________

Kindly specify other recommendations______________________

39. How often should refresher training be conducted?

- Monthly
- Every 3 months
- Every 6 months
- Yearly

Thank you for your participation in this survey. Your responses will help improve future training programs at Akatsi South Municipal Hospital.

APPENDIX III – ETHICAL CLEARANCE FROM ENSIGN GLOBAL UNIVERSITY

OUR REF: ENSIGN/IRB/EL/SN-313/03
YOUR REF:

August 4, 2025

INSTITUTIONAL REVIEW BOARD SECRETARIAT

Iris Dzifa Adzah
Ensign Global University
Kpong.

Dear Iris,

ETHICAL CLEARANCE TO UNDERTAKE POSTGRADUATE RESEARCH

At the General Research Proposals Review Meeting of the *INSTITUTIONAL REVIEW BOARD (IRB)* of Ensign Global University held on Friday, August 1, 2025, your research proposal entitled **"Improving Quality of Care Through In-Service Training Programs at Akatsi South Municipal Hospital of the Volta Region of Ghana"** was considered.

You have been granted Ethical Clearance to collect data for the said research under academic supervision within the IRB's specified frameworks and guidelines.

We wish you all the best.

Sincerely,

Dr. (Mrs.) Rebecca Acquaah-Arhin
IRB Chairperson

P.O. Box AK 136 | Tema-Akosombo Highway, Kpong, Eastern Region, Ghana|
https://www.ensign.edu.gh |+233 245 762 229

APPENDIX IV – INSTITUTIONAL APPROVAL FROM AKATSI SOUTH MUNICIPAL HOSPITAL

GHANA HEALTH SERVICE

AKATSI SOUTH MUNICIPAL HOSPITAL

P. O. BOX AK 83, AKATSI
Digital Address: VX-0010-1825
Email Address: akatsi.dhvr@gov.gh
TEL: 0548 805 698 / 0544 666 114
Quote this number and date on all correspondences
My Ref. No.:
Your Ref.

JUNE 22, 2025

DR. IRIS DZIFA ADZAH,
AKATISI SOUTH MUNICIPAL HOSPITAL,
VOLTA REGION, GHANA.

AUTHORIZATION TO CONDUCT THESIS RESEARCH

I write to formally grant you approval to conduct your thesis on the topic**: "Improving Quality of Care through In-Service Training Programs at Akatsi South Municipal Hospital in the Volta Region of Ghana."**

This authorization permits you to carry out all necessary research activities within Akatsi South Municipal Hospital related to the approved topic. You are required to strictly adhere to all ethical standards, institutional guidelines, and procedures governing research activities within the hospital. Confidentiality, respect for patients and staff, and professional conduct must be always maintained.

Kindly liaise with the relevant departments and units as needed. We look forward to the valuable insights your work will contribute to improving the quality of care in our facility.

We look forward to the outcomes of your research and the positive contributions it will make toward improving the quality of care at our facility.

Please accept our best wishes for a successful project.

Best regards,

DAVID DORDOE
ADMINISTRATIVE MANAGER

APPENDIX V – REPORT ON TRAINING IN OBSTETRIC EMERGENCIES

REPORT ON TRAINING IN OBSTETRIC EMERGENCIES

DATE: 30TH AND 31ST JULY 2024

VENUE: UNCOMPLETED HOSPITAL LAUNDRY.

A two (2) day workshop was organized for midwives the Akatsi South Municipality by the hospital management as a recommendation from region the last maternal mortality audit. The midwives in the five sub-districts and the hospital were divided in to two groups. Each group was schedule for a day.

Day 1.

The training started at 9:30am, opening prayer by midwife Akakpo. The administrator of the Municipal Hospital Mr. Mawuli welcomed everyone to the venue and encouraged us to have a fruitful impact as he handed over to Mr. Vorsah the clinical coordinator of the facility to take over the floor.

Mr. Vorsah also welcomed each and every midwife both from the hospital and various subdistricts he mentioned. It became necessary for this training based on the recommendation from the last Maternal Mortality audit done. The facilitator in the person of Dr. Ababio an Obstetrician Gynecologist from the Volta Regional Hospital was introduced. Pretest was done after that presentation was started by Dr. Ababio before then she mentioned it is going to be participatory hence everyone should be involved. After presentation, practical sections were done in pairs based on SBAR-Q communication (**S**ituation, **B**ackground, **A**ssessment, **R**ecommendation and **Q**uestions).

Snacks break was given at 12:56pm then practical session continued at 1:15pm with questions and answers coped with real situations or happening during the course of practices as midwives, doctors and pharmacists. Upon intensive practical sessions, the training was brought to a close with a closing remark by SMO Assan at 3:15pm and closing prayer at 3:20pm by MO Dado.

Day 2

A pre-test was done to access everyone. Opening prayers said by Sis Vicentia Akwaboah. Sis Rashida gave the purpose for the training and introduced the facilitator Dr. Ababio took us through the presentation outline. She also took us through the aims of triage training which is to easily differentiate between emergencies and normal. We spoke about the 3 delays and with

the expertise we have to always acquire more knowledge. We spoke about categorizing or a client. We spoke about BATLS (Battlefield Advanced Trauma Life Support). She mentioned that every woman should be attended to within 10 minutes on arrival in the hospital. A midwife must be responsible, accountable and must be a professional. We spoke about the midwife's role and her scope of practice.

Dr. Ababio took us through the MEOW's form and wrist branding. She also took us through the main causes of obstetric emergencies (the most important vital sign is perspiration). She also took us through the failures of the midwives, normal vital signs, vital sign changes in Hemorrhage and in sepsis. We went through effective communication using the SBAR-Q approach. We were educated on pre-eclampsia without severe features. We were educated on abruptio. We were educated on bed side clothing, MagSO4 by sis Rashida, Hydralazine and Labetalol protocol, pre-eclampsia with severe features, Ruptured Uterus, ectopic pregnancy, puerperal sepsis and pyrexia, obstructed labour by Dr. Ababio, delayed 2nd stage in nullip and multip, PPH, Sickle cell crisis in pregnancy, chorioamnionitis, septic incomplete abortion.
Sister Rashida gave numbers out for the District nurses to contact in terms of emergencies. A representative from the Directorate was called upon to say a word to the midwives in the subdistrict and encourage them to spread the word. Mr. Moses gave the vote of thanks as he spoke about creating a common platform for emergencies.

22416504:Iris_Dzifa_Adzah_(1).docx

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