NIU Journal of Social Sciences Copyright©2024
Nexus International University ISSN: *3007-1682;* 10(4): 17-30

Optimizing Primary Healthcare Infrastructure for Surgical Services in Dodoma: Strategies, Challenges, and Impact Assessment

FRANK JOSHUA RUHAZWE
Nexus International University, Uganda

Abstract. Efficient primary healthcare infrastructure is crucial for ensuring universal access to surgical services. However, optimizing this infrastructure presents several challenges, including resource allocation, workforce training, and service delivery. This study aims to explore strategies, challenges, and impacts of integrating surgical services into primary healthcare in Dodoma. A cross-sectional approach was used to collect quantitative data from 105 health workers at Dodoma Referral Hospital through questionnaires. Data were analyzed using SPSS V26, with results presented in descriptive and inferential statistics. The study identified various strategies for optimizing healthcare infrastructure, such as effective resource allocation, timely availability of surgical equipment, workforce training, capacity-building programs, and the integration of technology. However, challenges such as insufficient equipment, staffing shortages, limited access to specialized care, financial constraints, and regulatory barriers hindered the optimization process. Multiple linear regression results indicated significant influences of independent variables on the dependent variables ($p \leq 0.05$). Correlation analysis revealed a strong positive relationship between strategy implementation and infrastructure optimization ($r = .876^{**}$, $p < .05$). It also showed a very strong positive relationship between addressing challenges and infrastructure optimization ($r = .868^{**}$, $p < .05$), and the impact of implemented strategies on service improvement ($r = .859^{**}$, $p < .05$). The study suggests that addressing these challenges, enhancing collaboration among healthcare professionals, integrating technology, and providing policy support are crucial for improving surgical services. Strengthening primary healthcare infrastructure and addressing staffing shortages are recommended to optimize healthcare delivery in Dodoma.

Keywords: Healthcare, Healthcare Infrastructure, Surgical Services, Primary Healthcare

1. Introduction

1.1 Background of the Study

Primary healthcare infrastructure is critical to meeting a variety of health demands in the global healthcare environment, from the provision of necessary surgical procedures to preventative care (Kyoung Kyun Oh et al., 2023). Every year, more than 234 million surgical operations are carried out worldwide to treat common ailments like burns, cancer, diabetes, cataracts, birth abnormalities, and obstructed labor. Given that several conditions that may be treated surgically are among the top 15 causes of physical impairment globally, surgery is predicted to grow more popular in the years to come. There are over 100 million injuries worldwide, with 90% of the burden falling on low- and middle-income nations. As a result, immediate and better surgical infrastructure is required to save lives and lower the number of deaths brought on by injuries (World Health Organization, 2015; Nuss et al., 2024).

Although primary healthcare has always placed a strong emphasis on preventative and basic medical services, there has been a growing interest in the integration of surgical treatment in these settings (Reddy et *al.,* 2020). This change is a result of the realization that access to timely and suitable surgical therapies is crucial for improving health outcomes and that surgical conditions considerably contribute to the global burden of illness (Shabani et al., 2023). The World Health Organization's Universal Health Coverage (UHC) objective, which emphasizes the value of accessible, affordable, and high-quality healthcare for everyone, including surgical treatment,

is in line with the acceptance of surgical services in primary healthcare settings (Yanful et al., 2023).

Universal Health Coverage (UHC) is a global goal aimed at providing high-quality, needs-based healthcare services without financial hardship. Organization for Economic Cooperation and Development (OECD) explains that it consists of three components: essential services, financial protection, and coverage for the entire population (OECD, 2023). To achieve UHC, interventions should focus on supply and demand sides of the healthcare system, including infrastructural development and skilled personnel. Strategic infrastructure development can improve geographical access to health services, strengthen referral systems, increase service utilization, and improve health outcomes (Kapologwe et al., 2020a, Bhatia et al., 2022).

Global surgery has evolved over the past 40 years, with the majority of the world's population lacking access to skilled surgical care (Quene et al., 2022). In 2008, Paul Farmer and Jim Kim described global surgery as "the neglected stepchild of global health," which galvanized the global surgery community (Qin et al., 2023; Guest et al., 2017). In 2015, the World Bank published a volume on global surgery, and the Lancet Commission on Global Surgery published its findings (WHO, 2022). The World Health Organization (WHO) has linked surgery to social inequity, with the Lancet Commission on Global Surgery and World Health Assembly Resolution 68.15 contributing to this momentum (WHO, 2017; Bath et al., 2019). UNFPA reports in over 120 low-income countries to advocate for the inclusion of sexual and reproductive health services, as over 5 billion people worldwide lack access to safe, timely, and affordable surgical care which results in 4.2 million deaths annually ((UNFPA, 2023 & 2024) . Investing in quality surgical health care could prevent disability, mortality, and macroeconomic loss, especially for low- and middle-income countries. Untreated surgical conditions could result in a cumulative loss of $20.7 trillion in the global economy, with more than half occurring in LMICs (Pigeolet et *al*., 2023).

Optimizing primary healthcare infrastructure for surgical services is not without its difficulties, though. The requirement for extensive capacity-building programs to provide basic healthcare institutions with the tools, training, and equipment required for surgical procedures is one of the main challenges (Ntuli Angyelile et al., 2020). One major obstacle that still needs to be addressed is the lack of skilled surgeons in primary care settings. Success in implementing these measures is also influenced by cultural beliefs and community understanding on the role of primary healthcare in surgical services. The evaluation of these optimization initiatives' effects is complex and considers factors like better patient outcomes, less healthcare inequalities, and increased cost-effectiveness (Aveling et al., 2016; Bhati et al., 2023). By proactively tackling these obstacles, countries may develop strong primary healthcare systems that are able to provide crucial surgical services, advancing global health and accomplishing the objectives (Jumbam et al., 2023b).

Worldwide, most of developed countries have successfully optimized their primary healthcare infrastructure for surgical services through various strategies (African Development Bank Group, 2016; Akenroye et al., 2013). In Germany, the establishment of integrated care models and efficient referral systems has improved coordination between primary care and surgical services, enhancing patient access and reducing delays (Lippok, 2018; Hirsch et al., 2012; Schlette et al., 2009). Australia's success lies in its investment in telehealth technologies, facilitating remote consultations and preoperative assessments, thereby increasing accessibility to surgical care, especially in rural areas (Australian Government, 2022; Asiri et al., 2018; Mathew et al., 2023). Sweden's focus on standardized care pathways and multidisciplinary collaboration has streamlined the surgical process, ensuring consistent and high-quality care (Australian Government, 2022). Canada's success is attributed to a robust public healthcare system and targeted funding for surgical capacity expansion, addressing wait times and improving patient outcomes (Government of Canada, 2023). The success of these nations was faced by several challenges including resource allocation, workforce shortages, and technology implementation hurdles, which were mitigated through innovative solutions such as workforce training programs, public-private partnerships, and technology integration (Martin et al., 2018). The impact assessments indicated improved patient satisfaction, reduced wait times, and enhanced overall healthcare system efficiency in these countries (Sumalinog et al., 2015).

In developing countries health insurances campaigns have been implemented in different sectors, health care organizations have become front lines of addressing health equity, playing significant roles in not merely access and care delivery, but also as employers, community members, and advocates for change (Sara et al., 2021; Hsiao et al., 2007; Venkateswaran et al., 2022). This have been advantageous in providing equitable access to care, fulfilling our human potential in all aspects of health

and well-being, accomplishing an overall state of well-being encompassing clinical, mental, social, emotional, physical, and spiritual health (Duku, 2018).

Tanzania, being among the developing countries, is also facing health Insurance challenges mostly to employed group of low wages. There is a tight public health care budget and growing need to improve access to health services, especially for the poor, majority of them working in the informal sector (Mnally, 2013; Swere, 2016). In dealing with these challenges socio-economic trends and political situation seems that health financing policy will become a major issue in Tanzania (Nuhu et al., 2020). Tanzania's rapid population growth is expected to reach 89.2 million people by 2035, necessitating significant infrastructure development, particularly in primary health facilities, to limit the increase in mortality rates, particularly neonatal and maternal mortality. Quality maternal health services have been a top priority for Tanzania's health sector, with a permanent agenda in all of its strategies, including the Health Sector Strategic Plans III and IV, the National Surgery, Obstetric and Anesthesia Plan (NSOAP), and Development Vision 2025 (NBS, 2018).

Tanzanian health policies have established a clear objective of achieving primary health care for all, by designing and implementing initiatives for increasing access to health care and ensuring that a majority of people live within 5 kilometers of health facilities. Reforms have been implemented in primary health care, such as the Health Sector Reform of 1994, the Medical Stores Department (MSD), Prime Vendor System (PVS), Health financing reforms, and Direct Health Facility Financing (DHFF) (Kapologwe et al., 2020).

From 2015 to 2019, there has been improvement in the physical status of primary health facilities, with 46% having a good state, 33% needing minor renovation, and 5.1% having landline telecommunication systems. Between 2015 and August 2019, a total of 419 health facilities (8.3%) were either renovated or constructed and equipped to offer safe surgery services (Endalamaw et al., 2023). Only 115 health centers (22.2%) offered Comprehensive Emergence Obstetric Care (CEMONC) services, 17.4% offered CEMONC services with all 9-signal functions (parenteral administration of antibiotics, treatments for eclampsia, parenteral administration of oxytocin, vacuum extraction, manual removal of placenta, removal of retained products of conception, newborn care, blood transfusion, and caesarian delivery of fetus in emergencies) and 17.4% had facilities offering safe blood transfusion services (Kapologwe et al., 2020a).

The lack of focused investigation into these facets is a major obstacle to the area's healthcare system, affecting the prompt and effective provision of surgical services. Consequently, a targeted study is necessary to guide policy and practice for the enhancement of Dodoma's primary healthcare system, guaranteeing the community's improved access to quality surgical services.

1.2 Statement of Problem

In many nations, achieving universal health coverage (UHC) is at the top of the agenda for health reform as defined by the World Health Organization (WHO) as the ideal functioning of an effective health system, whereby everyone has access to essential health services (such as palliation, promotion, treatment, prevention, and rehabilitation) of a caliber that is both effective and affordable (WHO, 2017).

In Tanzania, different interventions have been implemented to ensure health stabilization mostly in Surgery. During the December 2016 Joint Annual Health Sector Review conference, Presidential Office - Regional Administration and Local Government and Ministry of Health and Community Development, Gender and Elderly Care (MOHCDGEC). worked with many stakeholders, including Development Partners and reached a consensus on ways to enhance the physical state of deteriorating health facility buildings (MOHCDGEC, 2016). These include construction of new health facilities, renovation of old health facilities, Equipment availability, equipment processing, and Safe Surgery training to improve surgical performance. In December 2016, about 5072 primary health facilities were constructed, with 90% in rural and 10% in urban areas. 42.5% of people lived within 5-10km of these facilities. Between 2015 and 2019, 508 primary health facilities were constructed and renovated, including 350 health centers and 69 District Council Hospitals, and 390 staff houses (Kapologwe et al., 2020b).

Despite the importance of surgical interventions in addressing health issues, there is a lack of comprehensive understanding regarding the strategies essential for enhancing primary healthcare infrastructure for surgical services in Tanzania. Kapologwe et al. (2020b) reported that only 46% of primary health care facilities have a good state, with a majority (54%) of the health facilities left in poor state. Jumbam et al. (2023a) argues that low- and middle-income countries including Tanzania have develop national surgical, obstetric, and anesthesia plans (NSOAPs) but financing remains a challenge, fiscal space options from the beginning of policy

development are needed to take place. Azevedo (2017) also portrays that the absence of a structured and integrated framework for essential surgical services within Tanzania public primary healthcare facilities exacerbates several issues. This includes disparities in healthcare access, limited availability of surgical care, exacerbated financial burdens on individuals seeking surgical treatments, and fragmented healthcare delivery systems.

With this standing, this research aims to address this gap by investigating the specific strategies required for optimization, identifying challenges hindering the process. The absence of a targeted exploration of these aspects poses a significant barrier to the region's healthcare system, impacting the timely and efficient delivery of surgical services. Therefore, a focused investigation is essential to inform policy and practice for the improvement of primary healthcare infrastructure in Dodoma, ensuring better access and quality of surgical services for the local population.

1.3 Research Objective

This study focuses on Optimizing primary healthcare infrastructure for surgical services in Dodoma: It aims to identify the strategies, challenges, and impact of surgical service integration in primary healthcare at Dodoma region

2. Literature Review

2.1. Strategies Aimed at Optimizing Primary Healthcare Infrastructure

Stafinski et al., (2022) aimed to identify strategies used in Canada and internationally to improve wait times for patients, healthcare providers, and policymakers. Interviews with key informants from 14 countries and a scoping review were conducted to identify approaches targeting wait times. Results were compiled into tables and synthesized based on a conceptual framework. The study included 32 interviews, 92 peer-reviewed studies, and 242 documents from grey literature. 33 approaches were identified, with the majority targeting the supply-side. Fifteen approaches had consistent or limited but promising evidence supporting their effectiveness. Successful strategies require the implementation of multiple approaches and collaboration. Access to optimal care remains a top priority for patients, healthcare providers, and policymakers.

Okoroafor & Christmals, (2023) aimed to develop an implementation framework for task shifting and task sharing in Africa to improve access to people-cantered health services. A sequential multimethod research design, scoping reviews, and qualitative descriptive study were employed. The framework was evaluated for applicability in Africa by 36 subject matter experts. The framework has three core components: context, implementation strategies, and intended change. The implementation strategies include mapping and engaging stakeholders, generating evidence, developing, implementing, and reviewing a road map, and educating health workers using manuals, job aids, curriculum, and clinical guidelines. The framework serves as a guide for actions needed to achieve national, regional, and global goals based on contextual evidence. It illustrates the rationale and role of a combination of strategies in achieving universal health coverage (UHC).

The study of Kofi & Ussiph, (2017) aimed to optimize access to primary health care services in rural communities using Geographical Information System (GIS) in the Atwima Mponua District of Ghana. The research collected location data for 180 communities and existing health facilities using a GPS device. The data was analysed using the ArcGIS network analysis model and population data. The results showed that 61 out of 180 communities had no healthcare facility within an 8km radius, resulting in a large proportion of residents having to travel a long way to access healthcare. On average, patients travel between 6.62km and 21.20km to access healthcare. The study found that 26.39% of the district population lived beyond the 8km service area criteria. The study demonstrates that optimizing healthcare accessibility based on WHO standards can improve equity and spatial accessibility for the people of Atwima Mponua.

Kokko, (2022) examines the Triple Aim framework for health system assessment, focusing on the concept of balance among its goals. It evaluates the policy-level impact of value-based healthcare movements based on the Triple Aim goals. The analysis reveals a lack of consensus on the impact of each goal and the concept of a balance, and a lack of literature on the pursuit of the Triple Aim at the health system level. The study aims to contribute to improved health system performance assessment, development of the Triple Aim framework measures, and enhanced effectiveness in achieving healthcare goals.

Kapologwe et al., (2020b) analysed the public sector's efforts to improve the infrastructure of primary health facilities between 2005 and 2019 in Tanzania. Data was collected from various sources, including policy reports, the Services Availability and Readiness Assessment tool, the Health Facility Registry, implementation reports, and the Comprehensive Emergence Obstetric Care (CEMONC) signal functions assessment tool. The results showed that

46% of existing facilities had a good state, 33% needed minor renovation, and only 5% had water and telecommunication systems. Between 2015 and 2019, 8.3% of health facilities were renovated or equipped to offer safe surgery. However, there is still a high demand for good physical statuses and functioning primary health facilities to offer essential and safe surgical services.

2.2 Challenges Hindering the Optimization of Primary Healthcare Infrastructure

Grimes et al. (2019) highlight the lack of infrastructure in primary healthcare facilities for surgical services, including well-equipped operating rooms, recovery areas, and sterilization facilities. Insufficient availability of surgical equipment, anesthesia machines, and diagnostic tools can hinder the provision of surgical care. Facilities lacking basic amenities may struggle to maintain hygiene and safety standards during surgeries. Human resource challenges, such as the scarcity of trained surgeons, anesthetists, and perioperative nurses, also hinder the delivery of surgical services. Capacity-building initiatives are needed to attract and retain skilled healthcare professionals in remote or underserved areas, due to limited career development opportunities and inadequate living conditions.

The study by Shrime et al. (2015) highlights the challenges in optimizing primary healthcare infrastructure for surgical services. Limited financial resources can restrict investments in infrastructure development, staff training, and equipment procurement. Patients may face financial barriers, such as out-of-pocket expenses, which may prevent them from seeking surgical care. Cultural beliefs, misconceptions, and mistrust in healthcare providers can also deter community members from seeking surgical care. Traditional healing methods may compete with modern surgical interventions, and cultural norms and gender roles may affect access to surgical care, especially for women. Inconsistent or inadequate policies and regulations related to surgical services at the primary healthcare level pose challenges, necessitating advocacy for policy changes. Maintaining a consistent supply chain for surgical equipment, medications, and consumables is crucial in resource-constrained settings. Insufficient data collection and monitoring systems also hinder the assessment of surgical service quality and outcomes. Robust information systems are needed for effective monitoring.

The study of Swere, (2016) examines the challenges hindering Tanzania's health service accessibility, including inadequate funding, a shortage of fully trained health staff, and poor communication and transport infrastructure. These issues hinder Tanzania's health system's development plans, including the Millennium Development Goal, due to its small budget. The review article provides a broader analysis of these challenges and recommends the Tanzanian government to take significant steps to resolve these issues.

2.3 The Impact of Implemented Strategies on Surgical Service Provision

Espinosa-González et al., (2019) studied the interactions between primary health care (PHC) functions and their impact on care delivery and outcomes. Using a system thinking approach and data from a three-round European Delphi process, the researchers developed a framework that analysed the correlations between PHC characteristics, how actors shaped these interactions, and their potential effect on care delivery. The findings showed that governance, financing, and regulation are influenced by their degree of decentralisation. The study suggests that this approach can help identify limitations due to poor accountability and commitment to shared objectives, and help design realistic and long-term policies for health system strengthening.

George et al. (2023) aimed to explore the impact of health system governance interventions on the quality of healthcare services in low-/middle-income countries (LMICs). A scoping review of 201 primary studies was conducted, focusing on leadership, system design, accountability and transparency, financing, private sector partnerships, information and monitoring, participation and engagement, and regulation. The findings revealed a stronger evidence base linking improved quality of care with health financing, private sector partnerships, and community participation and engagement strategies. The evidence related to leadership, system design, information and monitoring, participation and engagement, and regulation was also found to be robust. This research underscores the importance of improving healthcare quality in LMICs for achieving Universal Health Coverage and sustainable development goals.

The study by Alkire et al. (2018) found that early detection and management of surgical conditions can reduce morbidity and mortality rates. Integrating surgical services into primary healthcare offers a holistic approach to patient care, addressing both surgical and non-surgical health needs. This approach improves access to essential surgical services, especially in underserved and rural areas. It also

addresses health disparities by ensuring equitable access across different socio-economic groups. Vulnerable populations benefit from primary-level services, leading to increased utilization. Delivering surgical services at the primary healthcare level can be cost-effective, reducing the financial burden on individuals and the healthcare system. Early intervention and preventive measures can prevent the need for more expensive treatments.

Sheikh et al. (2011) argue that integrating surgical services into primary healthcare can make care more affordable, especially in low- and middle-income areas. This prevents catastrophic health expenditures and delays, promoting financial protection for individuals and households. Timely surgical interventions also lead to faster recovery times, promoting economic productivity. Integrating surgical services supports a holistic approach to healthcare delivery, positively impacting community health and well-being by addressing a range of health issues beyond surgical conditions.
Larkins et al. (2019) suggest that integrating surgical services can reduce health inequalities by providing equal access to essential care for individuals from different socio-economic backgrounds. Early surgical interventions at the primary healthcare level can prevent disease progression and reduce long-term treatment costs, contributing to overall cost savings in the healthcare system.

3. Research Methodology

This study utilized a cross-sectional and correlational design. The cross-sectional design was chosen to efficiently capture a snapshot of surgical service integration in primary healthcare at Dodoma, allowing simultaneous data collection from various respondents. The correlational design helped assess the relationship between dependent and independent variables using multiple linear regression and bivariate correlation analysis. The quantitative approach involved questionnaires to gather primary data, which was analyzed through descriptive statistics and regression techniques. Normality and collinearity tests were also conducted.

The study took place at Dodoma Regional Referral Hospital, a key healthcare facility in Central Tanzania, established in 1930 with 420 beds and 35 outpatient rooms. Serving as a referral center for several districts, the hospital plays a crucial role in surgical care. The study aimed to explore strategies to enhance primary healthcare infrastructure for surgical services in Dodoma, focusing on challenges and impacts.

The population consisted of health workers involved in surgeries, aged 20 to 51, across departments like ENT, General Surgery, Obstetrics, Ophthalmology, Orthopedic, and Oral and Dental services. Inclusion criteria focused on healthcare workers directly involved in surgeries, while non-surgical staff, those outside the specified departments, and workers outside the age range were excluded.
Sample size determination followed the formula by Younas (2019), resulting in a sample size of 111 participants, accounting for a 10% non-response rate. Multi-stage sampling was used, starting with purposive selection of Dodoma as the study area due to its strategic healthcare importance. The hospital was selected as the primary site, and surgical departments relevant to the study were identified.

Primary data was collected using structured questionnaires, which included consent forms, demographic questions, and sections on strategies to optimize surgical services, challenges, and impacts. The questionnaire was available in both English and Kiswahili to ensure clarity for participants.

Data was analyzed using SPSS version 26 and Microsoft Excel for cleaning, sorting, and coding. Descriptive statistics, Chi-square tests, and linear regression were used to identify associations between variables. The reliability of the instruments was tested using Cronbach's Alpha, with satisfactory results (values above 0.7). Validity was ensured through pilot testing, and the instruments were adjusted based on feedback.

4. Results

Table 4.1: Respondent Rate

Respondents	Frequency	Percentage
Responded	105	94.59
Not responded	6	5.41
Total	111	100

Source: *Field Data, (2024)*

Table 4.1 shows that only 105 out of 111 respondents responded and provided accurate answers to this study. Therefore, the study analysis based on response rate of 94.59% which is fair and representative according to (Mugenda, 2003) stated that, a response rate of >50% is required for analysis and representation of data.

Table 4.2: Demographic Information of respondents

Demographic Information (N=105)	**Frequency**	**Percentage (%)**
Gender		
Male	56	53.33
Female	49	46.67
Age of Respondent (Years)		
20-30	8	7.62
31-40	22	20.95
41-50	40	38.10
51 Years and Above	35	33.33
Respondent Education Level		
Certificate	22	20.95
Diploma	30	28.57
Bachelor	43	40.95
Masters and above	10	9.53
Respondent's Role		
Surgeon	10	9.52
Anesthetist	8	7.62
Surgical Nurse	15	14.29
Surgical Technologist	7	6.67
Operating Room (OR) Coordinator	11	10.48
Surgical Assistant	20	19.05
Recovery Room Nurse (PACU Nurse)	12	11.43
Infection Control Practitioner	9	8.57
Perioperative Nurse	13	12.38
Years of Experience in surgical services		
0 - 2 Years	9	8.57
3 - 4 years	21	20.00
5 - 6 Years	42	40.00
7 Years and above	33	31.43

Source: *Field Data, (2024)*

The table 4.2 shows a balanced gender distribution, with 53.33% male and 46.67% female respondents, the majority being experienced professionals aged 41-50 (38.10%), highly educated with most holding bachelor's degrees (40.95%), and holding diverse roles like surgical assistants (19.05%) and nurses (14.29%), with significant experience, particularly 5-6 years (40%) and 7+ years (31.43%), showcasing their expertise and deep insights into healthcare infrastructure and surgical service integration.

5. Descriptive Analysis Findings

Research findings Presented based on questionnaires completed by respondents, who rated various statements using a scale from 1 (Strongly Disagree) to 5 (Strongly Agree). The researcher used an itemized rating scale to assess respondents' perceptions of each variable, with the mean score falling within specific intervals: 1.00–1.80 (Strongly Disagree), 1.81–2.60 (Disagree), 2.61–3.40 (Neutral), 3.41–4.20 (Agree), and 4.21–5.00 (Strongly Agree). The rating scale and intervals were based on Saunders (2016) to analyze the data.

4.3.1: SPECIFIC STRATEGIES AIMED

	N= 105	Mean	Std. Deviation	Interpretation
SSA1	Allocation of resources of facilities is well-aligned with the needs of surgical services	3.92	0.937	Agree
SSA2	Availability and accessibility of surgical equipment in our facility are timely and efficient	3.73	1.187	Agree
SSA3	Regular training and capacity-building programs are conducted to enhance the skills of surgical health workers	3.50	1.226	Agree
SSA4	Effective collaboration between surgical health workers and other healthcare professionals to optimize patient care	3.83	.985	Agree
SSA5	Integration of technology in our primary healthcare infrastructure enhances the efficiency of surgical services	3.80	1.087	Agree

SSA6	Patient education programs are implemented to promote awareness and understanding of surgical procedures and aftercare	3.59	1.335	Agree
SSA7	Structured feedback mechanism in place to gather input from surgical health workers regarding the effectiveness of healthcare infrastructure for surgical services	3.63	1.339	Agree
SSA8	Policy and Regulatory Support	4.02	1.126	Agree

Respondents generally agreed (mean values ranging from 3.50 to 4.02) that optimized primary healthcare infrastructure for surgical services is supported by well-aligned resource allocation, efficient equipment availability, regular training, technology integration, patient education, effective collaboration, and strong policy and regulatory frameworks.

4.3.2. CHALLENGES

	N= 105	Mean	Std. Deviation	Interpretation
CHO1	Lack of Adequate Surgical Equipment and Facilities	3.71	1.072	Agree
CHO2	Insufficient Training and Capacity Building Programs	3.58	1.299	Agree
CHO3	Inadequate Staffing Levels for Surgical Services	3.57	1.208	Agree
CHO4	Limited Access to Surgical Specialties and Subspecialties:	3.60	1.334	Agree
CHO5	Challenges in Information Technology and Data Management	3.55	1.315	Agree
CHO6	Financial Constraints Impacting Surgical Services	3.55	1.126	Agree
CHO7	Regulatory and Administrative Barriers	3.52	1.324	Agree

The study identifies key challenges in optimizing primary healthcare infrastructure for surgery in Dodoma, including a lack of adequate equipment (mean value 3.71), insufficient training (mean value 3.58), and inadequate staffing (mean value 3.57). Respondents also highlight limited access to surgical specialties (mean value 3.60), IT and data management issues (mean value 3.55), financial constraints (mean value 3.55), and regulatory barriers (mean value 3.52) as significant obstacles. These factors collectively hinder the effective delivery of surgical care in the region

4.3.3 IMPACT OF IMPLEMENTED STRATEGIES

	N= 153	Mean	Std. Deviation	Interpretation
IIS1	Resource Availability	3.86	1.087	Agree
IIS2	Patient Satisfaction	3.97	0.871	Agree
IIS3	Quality of Surgical Care	3.97	0.945	Agree
IIS4	Training and Professional Development	3.84	1.102	Agree
IIS5	Community Outreach and Awareness	3.91	0.942	Agree
IIS6	reduced waiting times	3.59	1.089	Agree
IIS7	more sustainable surgical healthcare system	3.72	1.114	Agree
IIS8	improved the dissemination of surgical guidelines and protocols	4.01	0.814	Agree

The majority of respondents (mean values ranging from 3.59 to 4.01) agreed that the implemented strategies significantly improved various aspects of surgical service provision in Dodoma's primary healthcare infrastructure, including resource availability (3.86), patient satisfaction (3.97), care quality (3.97), workforce training (3.84), community awareness (3.91), waiting times (3.59), system sustainability (3.72), and the dissemination of surgical guidelines (4.01).

4.4. Model Summary

4.4.1. MULTIPLE LINEAR REGRESSION MODEL

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.893[a]	.798	.792	.428	.374

Predictors: (Constant), Strategies, Challenges, Impacts
dependent: Optimizing primary healthcare infrastructure.

The regression model reveals that 79.2% of the variation in optimizing primary healthcare infrastructure for surgical services in Dodoma is explained by the predictor variables—strategies, challenges, and impacts—while the remaining

20.8% is influenced by other factors; with a strong positive correlation (R = 0.893) between these determinants and the optimization process

4.4.2. ANALYSIS OF VARIANCE (ANOVA)

1 Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	72.913	3	24.304	132.853	.000[b]
Residual	18.477	101	.183		
Total	91.390	104			

Predictors: (Constant), Strategies, Challenges, Impacts
Dependent: Optimizing primary healthcare infrastructure
Results (Sig = 0.000, $p < 0.05$) confirm that the model is statistically significant at a 95% confidence level, indicating a meaningful relationship between the dependent and independent variables.

4.4.3. CORRELATION ANALYSIS TEST

	Mean	Std Deviation	1	2	3	4
1Strategies			1			
2Challenges			.820**	1		
3Impacts			.774**	.968**	1	
4Optimizing primary healthcare infrastructure			.876**	.868**	.859**	1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
Source: *Field Data (2024)*

4.4.4. MULTIPLE REGRESSION ANALYSIS COEFFICIENTS

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.475	.216		2.202	.029
	SSA	.652	.098	.627	6.666	.000
	CHO	.219	.087	.210	2.526	.013
	IIS	.007	.114	.007	.063	.001

a. Dependent Variable: Optimizing primary healthcare infrastructure

Keyword: SSA = Strategies, CHO = Challenges, IIS= Impacts
Regression is significant at the 0.05 level (2-tailed

Specifically, implementing strategies (SSA) has a strong positive effect on infrastructure optimization ($\beta = 0.652$, $p < 0.001$), while challenges in services (CHO) negatively impact optimization ($\beta = -0.219$, $p = 0.013$). Additionally, analyzing the positive impacts of implemented strategies (IIS) also contributes positively ($\beta = 0.007$, $p < 0.001$), highlighting the importance of strategic implementation and challenge mitigation in enhancing surgical service infrastructure.

6. Discussion

This study aimed to identify strategies for optimizing primary healthcare infrastructure in Dodoma to enhance surgical services delivery. The study respondents' average mean values ranging from 3.59 to 4.02 reveals respondents' agreements on availability of several strategies, including resource allocation, timely availability and accessibility of surgical equipment, regular training and capacity-building programs, effective collaboration between healthcare professionals, integration of technology, patient education programs, structured feedback mechanisms, and policy and regulatory support.

However, challenges hindered the optimization of primary healthcare infrastructure for surgical services in Dodoma with respondents' agreements with average mean values from 3.71 to 3.52. The lack of adequate surgical equipment and facilities, insufficient training and capacity-building programs, inadequate staffing levels, limited access to surgical specialties and subspecialties, challenges in information technology and data management, financial constraints, and regulatory and administrative barriers were identified as significant challenges.

The impact of implemented strategies on surgical service provision within Dodoma's primary healthcare infrastructure was also evaluated. Results of respondents mean values 3.59 to 4.01 depict that implemented strategies positively impacted resource availability, patient satisfaction, quality of care, training and professional development opportunities, community interaction and awareness efforts, reduced

waiting times for surgical services, and built a more sustainable surgical healthcare system. Additionally, they improved the dissemination of surgical guidelines and protocols, suggesting better standardization and adherence to best practices in surgical care delivery.

The study used inferential statistical analysis to identify the strategies, challenges, and impact of surgical service integration in primary healthcare at Dodoma Referral Hospital. A Multiple linear regression model was applied to assess the influence of dependent variables (Optimizing primary healthcare infrastructure) and independent variables (Strategies, Challenges, Impacts). The regression model showed that 79.2% of the variance in optimizing primary healthcare infrastructure for surgical services in Dodoma was explained by the variation of the three predictor variables, while the remaining 20.8% was explained by other variables not explained in the model. ANOVA was used to test the hypothesis that multiple R in the population equals 0. The results showed a strong positive relationship between implementing specific strategies and optimizing primary healthcare infrastructure for surgical services, solving persisting challenges, and the impact of implemented strategies on surgical services.

Multiple linear regression analyses were conducted to evaluate the influence of each predictor variable separately. The study found that implementing specific strategies (SSA) positively influenced optimizing primary healthcare infrastructure on surgical services, while the minimizing present of challenges in services (CHO) had a positive influence. Analyzing positive impacts from implemented strategies (IIS) also had a significant effect on optimizing primary healthcare infrastructure for surgical services with beta values of 0.652, 0.219 and 0.007 respectively.

7. Recommendations

The study highlights the importance of strategic professional development and collaboration within Dodoma Referral Hospital's healthcare ecosystem. Continuous training, interdisciplinary teamwork, and technology integration can significantly improve surgical services. Strengthening primary healthcare infrastructure, particularly in surgical services, requires dedicated resources for equipment, training, and addressing staffing shortages. Policymakers must streamline regulatory processes and secure sustainable funding to ensure long-term surgical care improvements.

Collaborative policymaking, involving key stakeholders, is crucial to enhancing the healthcare system's resilience. The study also recommends expanding research to include other primary healthcare infrastructures across Tanzania, beyond just Dodoma.

References

African Development Bank Group. (2016). Strategy For Quality Health Infrastructure In Africa 2022-2030 Revised. Evaluation Systems in Development Co-Operation, February, 77–80. https://doi.org/10.1787/9789264262065-8-en

Akenroye, O. O., Adebona, O. T., & Akenroye, A. T. (2013). Surgical care in the developing world-strategies and framework for improvement. *Journal of Public Health in Africa*, 4(2), 88–94. https://doi.org/10.4081/jphia.2013.e20

Alkire BC, Shrime MG, Dare AJ, Vincent JR, Meara JG. (2018). Global economic consequences of selected surgical diseases: a modelling study. *The Lancet Global Health*. 6(12), e1339–e1345.

Anderson, B. R. (2016). Improving health care by embracing Systems Theory. *Journal of Thoracic and Cardiovascular Surgery,* 152(2), 593–594.

Asiamah, N., Mensah, H. K., & Oteng-Abayie, E. F. (2017). General, target, and accessible population: Demystifying the concepts for effective sampling. *Qualitative Report* 22(6), 1607–1621.

Asiri, A., AlBishi, S., Madani, W., El-Metwally, A. A., & Househ, M. (2018). The Use of Telemedicine in Surgical Care: a Systematic Review. Acta Informatica Medica, 26, 201. https://doi.org/10.5455/aim.2018.26.201-206

Australian Government. (2022). Future focused primary health care: Australia's Primary Health Care 10 Year Plan 2022-2032. March, 71.

Aveling, E.-L., Zegeye, D. T., & Silverman, M. (2016). Obstacles to implementation of an intervention to improve surgical services in an Ethiopian hospital: a qualitative study of an international health partnership project. *BMC Health Services Research*, 16(1), 393. https://doi.org/10.1186/s12913-016-1639-4

Bath, M., Bashford, T., & Fitzgerald, J. E. (2019). What is 'global surgery'? Defining the multidisciplinary interface between surgery, anaesthesia and public health. BMJ Global

Health, 4(5), e001808. https://doi.org/10.1136/bmjgh-2019-001808

Bhati, D., Deogade, M. S., & Kanyal, D. (2023). Improving Patient Outcomes Through Effective Hospital Administration: A Comprehensive Review. Cureus, 15(10), e47731. https://doi.org/10.7759/cureus.47731

Bhatia, D., Mishra, S., Kirubarajan, A., Yanful, B., Allin, S., & Ruggiero, E. D. (2022). Identifying priorities for research on financial risk protection to achieve universal health coverage: A scoping overview of reviews. BMJ Open, 12(3), e052041. https://doi.org/10.1136/bmjopen-2021-052041

Bielecki, A., & Stocki, R. (2010). Systems Theory Approach to the Health Care Organization on National Level. Cybernetics and Systems, 41, 489–507.

Chu K, Rosseel P, Gielis P, Ford N. (2015). Surgical task shifting in sub-Saharan Africa. *PLoS Medicine,* 12(3), e1001815.

Davis, S. (2015). The Basics of Implementation Science. 22. https://ideadata.org/sites/default/files/media/documents/2017-09/allslides-implementationscience.pdf

Duku, S. K. O. (2018). Differences in the determinants of health insurance enrolment among working-age adults in two regions in Ghana. *BMC Health Services Research,* 18(1), 1–16. https://doi.org/10.1186/s12913-018-3192-9

Espinosa-González, A. B., Delaney, B. C., Marti, J., & Darzi, A. (2019). The impact of governance in primary health care delivery: A systems thinking approach with a European panel. *Health Research Policy and Systems,* 17(1), 1–16.

Finfgeld-Connett, D., Finfgeld-Connett, D., & Johnson, E. D. (2018). Data Collection and Sampling. A Guide to Qualitative Meta-Synthesis, January, 18–30. https://doi.org/10.4324/9781351212793-3

George, J., Jack, S., Gauld, R., Colbourn, T., & Stokes, T. (2023). Impact of health system governance on healthcare quality in low-income and middle-income countries: A scoping review. *BMJ Open*, 13(12), 1–16. https://doi.org/10.1136/bmjopen-2023-073669

Government of Canada. (2023, June 8). Canada is addressing current and emerging labour demands in health care. Www.canada.ca. https://www.canada.ca/en/employment-social-development/news/2023/06/canada-is-addressing-current-and-emerging-labour-demands-in-health-care.html

Grimes CE, Dare AJ, Gillies R, et al. (2019). Global Surgery: Defining an Emerging Global Health Field. *The Lancet Global Health*. 7(8), e882–e883.

Grimes CE, Law R, Chen DD, Dutton RJ. (2017). Systematic review of met and unmet need of surgical disease in rural sub-Saharan Africa. World J Surg. 41(6), 1370–1379.

Guest, G. D., McLeod, E., Perry, W. R. G., Tangi, V., Pedro, J., Ponifasio, P., Hedson, J., Tudravu, J., Pikacha, D., Vreede, E., Leodoro, B., Tapaua, N., Kong, J., Oten, B., Teapa, D., Korin, S., Wilson, L., Mesol, S., Tuneti, K., & Meara, J. G. (2017). Collecting data for global surgical indicators: a collaborative approach in the Pacific Region. *BMJ Global Health* 2(4), e000376.

Hirsch, O., Träger, S., Bösner, S., Ilhan, M., Becker, A., Baum, E., & Donner-Banzhoff, N. (2012). Referral from primary to secondary care in Germany: Developing a taxonomy based on cluster analysis. *Scandinavian Journal of Public Health*, 40, 571–578. https://doi.org/10.1177/1403494812455113

Hsiao, W. C., Shaw, R. P., Fraker, A., & Jowett, M. (2007). Social Health Insurance for Developing Nations - World Bank Institute development studies.

Jumbam, D. T., Reddy, C. L., Meara, J. G., Makasa, E. M., & Atun, R. (2023a). A Financing Strategy to Expand Surgical Health Care. *Global Health, Science and Practice*, 11(3). https://doi.org/10.9745/GHSP-D-21-00295

Jumbam, D. T., Reddy, C. L., Meara, J. G., Makasa, E. M., & Atun, R. (2023b). A Financing Strategy to Expand Surgical Health Care. *Global Health Science and Practice*, 11(3), 1–12. https://doi.org/10.9745/GHSP-D-21-00295

Kapologwe, N. A., Meara, J. G., Kengia, J. T., Sonda, Y., Gwajima, D., Alidina, S., & Kalolo, A. (2020a). Development and upgrading of public primary healthcare facilities with essential surgical services infrastructure*:* A strategy towards achieving universal health coverage in Tanzania*. BMC Health Services Research*, 20(1), 1–14.

Kapologwe, N. A., Meara, J. G., Kengia, J. T., Sonda, Y., Gwajima, D., Alidina, S., & Kalolo, A. (2020b). Development and upgrading of public primary healthcare facilities with essential surgical services infrastructure: A strategy towards achieving universal health coverage in Tanzania. *BMC Health Services*

Research, 20(1). https://doi.org/10.1186/s12913-020-5057-2

Kapologwe, N., Meara, J., Kengia, J., Sonda, Y., Gwajima, D., Alidina, S., & Kalolo, A. (2020). Development and upgrading of public primary healthcare facilities with essential surgical services infrastructure: A strategy towards achieving universal health coverage in Tanzania. *BMC Health Services Research,* 20. https://doi.org/10.1186/s12913-020-5057-2

King, D. K., Glasgow, R. E., & Leeman-Castillo, B. (2010). Re-aiming RE-AIM: using the model to plan, implement, and evaluate the effects of environmental change approaches to enhancing population health. *American Journal of Public Health*, 100(11), 2076-2084.

Kofi, A., & Ussiph, N. (2017). Optimizing Access to Primary Health Care Services in Rural Communities using Geographical Information System (GIS): A Case of Atwima Mponua District of Ghana. *International Journal of Computer Applications,* 163(10), 30–36. https://doi.org/10.5120/ijca2017913728

Kokko, P. (2022). Improving the value of healthcare systems using the Triple Aim framework: A systematic literature review. *Health Policy*, 126(4), 302–309. https://doi.org/https://doi.org/10.1016/j.healthpol.2022.02.005

Kothari, C. R. (2019). Research Methodology: Methods and Techniques (4th Editio). New Age International Publishers.

Kothari. (2006). Research Methodology; Methods and Techniques: New Delhi: New age International Publishers.

Kyoung Kyun Oh, Mfaume, R. S., Mbise, U. A., & Kapologwe, N. A. (2023). Urban health issues of the marginalised in Dar es Salaam, Tanzania: A resonant voice calling for action. *Journal of Global Health*, 13. https://doi.org/10.7189/jogh.13.03060

Larkins SL, Preston R, Matte MC, Lindemann IC, Samson R, Tandinco FD. (2019). Measuring social accountability in health professional education: Development and international pilot testing of an evaluation framework. *BMC Medical Education*, 19(1), 1–17.

Lippok, B. M. (2018). Optimizing the surgical patient flow in a German Hospital. http://essay.utwente.nl/75800/

Mac Queen, T., Bust, L., Louw, J., Mwandri, M., and Chu, K.M. (2022). Global Surgery is an Essential Component of Global Health. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8695837/.

Magadula, E., Mbwaga, S., Mutasingwa, F., and Herman, E (2023). Abstracts of 9th Tanzania Health Summit. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10463285/.

Makary MA, Weiser TG, Haynes AB, et al. (2015). The Lancet Commission on Global Surgery. The Lancet. 386(9993), 2231–2274.

Martin, D., Miller, A. P., Quesnel-Vallée, A., Caron, N. R., Vissandjée, B., & Marchildon, G. P. (2018). Canada's universal health-care system: achieving its potential. Lancet (London, England), 391(10131), 1718–1735. https://doi.org/10.1016/S0140-6736(18)30181-8

Mathew, S., Fitts, M. S., Liddle, Z., Bourke, L., Campbell, N., Murakami-Gold, L., Russell, D. J., Humphreys, J. S., Mullholand, E., Zhao, Y., Jones, M. P., Boffa, J., Ramjan, M., Tangey, A., Schultz, R., & Wakerman, J. (2023). Telehealth in remote Australia: A supplementary tool or an alternative model of care replacing face-to-face consultations? *BMC Health Services Research*, 23(1), 341. https://doi.org/10.1186/s12913-023-09265-2

Mnally, L. P. (2013). Determinants Of Health Insurance Participation Among Informal Sector Workers In Rural Tanzania Luitfrid. 66(1997), 37–39.

Mohajan, H. K. (2017). Two Criteria for Good Measurements in Research: Validity and Reliability. Annals of Spiru Haret University. *Economic Series,* 17(4), 59–82. https://doi.org/10.26458/1746

MOHCDGEC. (2016). The national road map strategic plan to improve reproductive, maternal, newborn, child and adolescent health in Tanzania (2016–2020) OnePlanII.

National Bureau of Statistics (NBS) - Ministry of Finance and Planning. National population projections. 2018. https://www.nbs.go.tz/nbs/takwimu/census2012/Projection-Report-20132035.pdf.

National Institute for Medical Research (NIMR). Evidence-informed policy making in the United Republic of Tanzania: setting REACH-policy initiative priorities for 2008–2010. Dar es Salaam; 2008.

Ntuli Angyelile Kapologwe, Meara, J. G., Kengia, J. T., Yusuph Sonda, Gwajima, D., Shehnaz Alidina, & Albino Kalolo. (2020). Development and upgrading of public primary healthcare facilities with essential

surgical services infrastructure: a strategy towards achieving Universal Health Coverage in Tanzania. Research Square (Research Square). https://doi.org/10.21203/rs.2.24208/v1

Nuhu, S., Mpambije, C. J., & Ngussa, K. (2020). Challenges in health service delivery under public-private partnership in Tanzania: Stakeholders' views from Dar es Salaam region. *BMC Health Services Research*, 20(1), 1–12.

Nuss, S. R., Nkurunziza, J., Mugabo, C., Marthe Kubwimana, Benimana, F., Uwera, C., Theodette Nyirasabwa, Naphtal Nyirimanzi, Forbes, C., Jean Paul Majyambere, Kateera, F., Hedt-Gauthier, B. L., & Cubaka, V. K. (2024). Increasing access to pediatric surgical care: Assessing district hospital readiness in rural Rwanda. World Journal of Surgery, 48(2), 290–315. https://doi.org/10.1002/wjs.12032

OECD. (2023). OECD Health Statistics 2023 Definitions, Sources and Methods. http://www.conaset.cl/programa/observatorio-datos-estadistica/biblioteca-

Okoroafor, S. C., & Christmals, C. Dela. (2023). Optimizing the roles of health workers to improve access to health services in Africa: An implementation framework for task shifting and sharing for policy and practice. *BMC Health Services Research*, 23(1), 1–12.

Pigeolet, M., Degu, S., Faria, I., Hey, M. T., Jean-Pierre, T., Lucerno-Prisno, D. E., Jafarian, A., Kanem, N., Meara, J. G., et al. (2023). Universal health coverage: a commitment to essential surgical, obstetric, and anesthesia care, World Health Summit 2021 (PD 20). *BMC Proceedings*, 17(6), 1–14.

Qin, R. X., Fowler, Z. G., Yoon, S., Jayaram, A., Stankey, M., Salmaan Keshavjee, Holian, A., Ibbotson, G., & Park, K. B. (2023). Strategic planning to improve surgical, obstetric, anaesthesia, and trauma care in the Asia–Pacific region: introduction. BMC Proceedings, 17(S5). https://doi.org/10.1186/s12919-023-00254-1

Qin, R. X., Fowler, Z., Jayaram, A., Stankey, M., Yoon, S., McLeod, E., & Park, K. B. (2023). The current status of surgical care in the Asia–Pacific region and opportunities for improvement: proceedings. BMC Proceedings, 17(S5). https://doi.org/10.1186/s12919-023-00255-0

Quene, T. Mac, Bust, L., Louw, J., Mwandri, M., & Chu, K. M. (2022). Global surgery is an essential component of global health. The Surgeon: *Journal of the Royal Colleges of Surgeons of Edinburgh and Ireland*, 20(1), 9–15. https://doi.org/10.1016/j.surge.2021.10.001

Reddy, C. L., Vervoort, D., Meara, J. G., & Atun, R. (2020). Surgery and universal health coverage: Designing an essential package for surgical care expansion and scale-up. *Journal of Global Health*, 10(2), 1–6. https://doi.org/10.7189/jogh.10.020349

Ringwalt, Chris, Sean Hanley, Amy A. Vincus, Susan T. Ennett, Louise A. Rohrbach, and J. Michael Bowling. (2008). The Prevalence of Effective Substance Use Prevention Curricula in the Nation's High Schools. *Journal of Primary Prevention* 29(6):479–88.

Roopa, S., & Rani, M. (2012). Questionnaire Designing for a Survey. *Journal of Indian Orthodontic Society*, 46(4_suppl1), 273–277.

Sara, S., Victoria, C., Gerhardt, W., & Symons, W. (2021). 2022 Global Health Care Outlook Are we finally seeing the long-promised transformation? Deloitte.

Schillinger, Dean. 2010. "An Introduction to Effectiveness, Dissemination and Implementation Research: A Resource Manual for Community Engaged Research." In P. Fleisher and E. Goldstein (eds.). UCSF Clinical and Translational Science Institute (CTSI) Resource Manuals and Guides to Community-Engaged Research. San Francisco, Calif.

Schlette, S., Lisac, M., & Blum, K. (2009). Integrated primary care in Germany: The road ahead. International Journal of Integrated Care, 9, e14. https://doi.org/10.5334/ijic.311

Shabani, J., Honorati Masanja, Kagoye, S., Minja, J., Shraddha Bajaria, Mlacha, Y. P., Msuya, S. E., Masoud, M., Daudi Simba, Pembe, A. B., Makuwani, A., Ismail, H., Maro Mwikwabe Chacha, Kumalija, C., Boerma, T., & Hanson, C. (2023). Quality of reporting and trends of emergency obstetric and neonatal care indicators: An analysis from Tanzania district health information system data between 2016 and 2020. *BMC Pregnancy and Childbirth,* 23(1). https://doi.org/10.1186/s12884-023-06028-z

Shrime MG, Bickler SW, Alkire BC, Mock C. (2015). Global burden of surgical disease: An estimation from the provider perspective. *The Lancet Global Health*. 3 Suppl 2, S8–S9.

Soni, P., & Khandelwal, S. (2021). A System Theory Approach in Management of Community Health Centers (Mid-Level Health

Organizations) in India. *Asian Pacific Journal of Health Sciences*, 8. https://doi.org/10.21276/apjhs.2021.8.3.09

Stafinski, T., Nagase, F. N. I., Brindle, M. E., White, J., Young, A., Beesoon, S., Cleary, S., & Menon, D. (2022). Reducing wait times to surgery-an international review. *Journal of Hospital Management and Health Policy*, 6.

Sumalinog, R., Abraham, L., & Yu, D. (2015). Preserving Medicare and Optimizing the Canadian Healthcare System. Canadian Federation of Medical Students, September.

Swere, K. (2016). Challenges Hindering the Accessibility of Tanzania's Health Service: A Literature Review. *International Journal of Economics and Finance*, 8, 242. https://doi.org/10.5539/ijef.v8n8p242

Swere, K. M. R. (2016). Challenges Hindering the Accessibility of Tanzania's Health Service: A Literature Review. *International Journal of Economics and Finance,* 8(8), 242. https://doi.org/10.5539/ijef.v8n8p242

UNFPA . (2024, April 16). New UNFPA report finds 30 years of progress in sexual and reproductive health has mostly ignored the most marginalized communities. Www.unfpa.org.
https://www.unfpa.org/press/new-unfpa-report-finds-30-years-progress-sexual-and-reproductive-health-has-mostly-ignored

UNFPA. (2023). United Nations Population Fund. Unified Budget Results and Accountability Framework (UBRAF) 2016-2021, 75–112. https://doi.org/10.1163/9789004632974_008

URT. Government of Tanzania launches a national strategy to ensure all Tanzanians can access safe surgical care by 2025. 2018.

Venkateswaran, S., Slaria, S., & Mukherjee, S. (2022). Political motivation as a key driver for universal health coverage. In Frontiers in public health (Vol. 10, p. 922578). https://doi.org/10.3389/fpubh.2022.922578

Weiner, B. J. (2023). What is Implementation Science? [Webpage].
https://impsciuw.org/implementation-science/learn/implementation-science-overview/

WHO. (2017). A network for improving quality of care for maternal, newborn and child health: Monitoring framework, (March 2016), 14–16.

WHO. (2017). Surgical Care Systems Strengthening.

World Health Organization. (2015). Strengthening emergency and essential surgical care and anaesthesia as a component of universal health coverage Report by the Secretariat. Provisional Agenda Item 5.1, May, 16–18.

World Health Organization. Quality of care network - Resources and data related to maternal, newborn and child health quality of care measurement. Maternal, newborn, child and adolescent health and ageing. 2022.

Yanful, B., Kirubarajan, A., Bhatia, D., Mishra, S., Allin, S., & Di Ruggiero, E. (2023). Quality of care in the context of universal health coverage: a scoping review. *Health Research Policy & Systems*, 21(1), 1–29. https://doi.org/10.1186/s12961-022-00957-5