Case Study

Pan African Journal of Emergency Medicine and Critical Care (PAJEC)

Critical Care Service Transformation at the ALERT Comprehensive Specialized Hospital: A Case Study

Yared Boru Firissa[1,2*]

Keywords: ALERT, Critical Care, ICU.
1. Kampala International University, Uganda.
2. UNSOS, Somalia.
Correspondence: Yared Boru email: yaredfirissa@gmail.com
Received: December 2, 2023;
Accepted: February 9, 2024;
Published: February 29, 2024

ABSTRACT

Background

The intensive care unit (ICU) is a specialized department within a hospital that provides care for critically ill patients requiring close monitoring, multidisciplinary intervention, and advanced life support. It is a resource-intensive healthcare service, with the patient outcome determined by the adequate utilization of human resources, supplies, technologies, and infrastructure. ALERT Hospital is one of the largest referral hospitals that provides critical care services for both adult and pediatric patients. This case study narrates the establishment and transformation of critical care services at ALERT Hospital over the last five years.

Objective

To describe the transformation of critical care services at ALERT Comprehensive Specialized Hospital from the beginning of the service to the current state

Methods

A descriptive case study design was applied to narrate critical care service transformation at ALERT Comprehensive Specialized Hospital. Data was gathered from desk reviews of the emergency department, ICU, quality directorate, hospital data management unit, and the annual audit report.

Result

ALERT Hospital provides services for about 4.2 million people, encompassing 22 health centers, 8 hospitals, and other private health facilities within its catchment area. The ALERT Trauma Center, established in 2015, had only 3 ICU beds with two functional mechanical ventilators and a few trained nurses, with an annual hospital and emergency patient flow of 328,242 and 13,642, respectively. The critical care service expansion at ALERT Hospital encountered various obstacles concerning infrastructure, personnel, and supplies. Therefore, the hospital administration and clinicians designed and implemented different strategies to transform the service into the current picture. Accordingly, after intensive facilitation of all required inputs a general ICU with seven beds and five mechanical ventilators was initially established in 2018. During the second phase of the service expansion in 2022, the hospital has established a large ICU with twelve beds, providing more specialized services for over 349 critical patients annually.

Citation: *Yared Boru. Critical Care Service Transformation at the ALERT Comprehensive Specialized Hospital: A Case Study. PAJEC.2024;2(1):42 – 48.*

1. Introduction

ALERT (All Africa Leprosy, Tuberculosis, and Rehabilitation Training Center) Comprehensive Specialized Hospital, a former ALERT General Hospital advanced to Comprehensive Specialized Hospital as of 2023, is located in the capital Addis Ababa. It provides services for about 4.2 million people, encompassing 22 health centers, 8 hospitals, and other private health facilities within its catchment area. The hospital was established in 1934, and has been providing a limited number of services like dermatology, ophthalmology, and plastic surgery and was a center of excellence in blended comprehensive leprosy and TB/HIV training in the nation until recently.[1, 2] Later, the hospital expanded its services to include trauma care ("The ALERT Trauma Center"), which was established in 2015, emergency care, critical care, surgery, internal medicine, and other specialized services.[3] The intensive care unit (ICU) is a specialized department within a hospital that provides care for critically ill patients requiring close monitoring, multidisciplinary intervention, and advanced life support. It is a resource-intensive health care service, with the patient outcome determined by the adequate utilization of human resources, supplies, technologies, and infrastructure.[4] The idea of establishing an ICU in Ethiopia was first introduced in 1956 at Leelit Tsehay Hospital. However, it took 37 years for another ICU to be established, specifically for treating septic abortion and malaria.[5] Until 2019, there were only 53 public hospitals in Ethiopia that offered intensive care services to about 110 million people.[6] Currently, the number of ICUs in the country is estimated to be about 106, which were established as part of the pandemic response along with the leveraging of infrastructure, health systems, and capacity building in emergency and critical care services.[7, 8] Due to the demographic shift, the rapid increase in the advanced-age population and the high burden of diseases requiring intensive care make intensive care units an area of high demand. [9] In this regard, this case study narrates the evolution of critical care services at ALERT Hospital, from its inception to the current state.

2. Methods

A descriptive case study design was applied to narrate critical care service transformation at ALERT Comprehensive Specialized Hospital. Data was gathered from desk reviews of the emergency department, ICU, quality directorate, hospital data management unit, and the annual audit report. Data completeness was ensured by the author, who played a key role in leading the first phase of ICU establishment project from its beginning.

3. Critical Care Service in ALERT Hospital before 2018

The ALERT Trauma Center, established in 2015, had limited resource with only 3 ICU beds, 2 functional mechanical ventilators and a few trained nurses, with no senior doctors specialized in critical care. The ICU was aimed at keeping post-op neurosurgical patients, usually requiring close follow-up post-surgery. Despite the high volume of trauma cases seen at the center and the significant turnover of neurosurgery patients and other trauma patients requiring critical care, the limited capacity remained unchanged for approximately 3 years. The annual flow of patients in the hospital and emergency department was 328,242 and 13,642 respectively. Not only did the ICU have a small number of beds, but it also didn't fulfill the minimum standard required for an ICU to function; therefore, it has been used only to keep patients for a brief time until referral. Besides trauma patients, ALERT Hospital has also been providing care for other general medical and surgical patients who must be referred to other hospitals in the city for critical care services.

Despite the large catchment area under the hospital and referrals from other private health centers, there were no well-organized emergency

departments or critical care services in the Hospital to provide comprehensive care. From several unfortunate experiences clinicians used to face due to a lack of critical care services, these two case scenarios that were experienced by the newly assigned emergency physician created a paradigm shift: ''a 46-year-old RVI patient presented with respiratory distress and altered mentation, diagnosed with CNS toxoplasmosis'' and "a 32-year-old woman presented with toxic Multi nodular goiter with a thyroid storm," in which referral and management in the hospital were not successful for both patients. These sample scenarios sparked the first move in the development of critical care services at ALERT Hospital.

The journey to establishing the ICU:

Recognizing the increasing demand for critical care services and the need to enhance health care provision, ALERT Hospital embarked on a transformative journey aimed to expand the range of services offered, including the establishment of ICU. Therefore, in order to benefit from the opportunity of "quick win" program that the Ministry of Health has implemented as part of the Federal Hospital's service development, the director of the ALERT hospital emergency department took the initiative to draft a proposal. The proposal was subsequently presented to the CEO of ALERT Hospital as well as the Ethiopian Ministry of Health. The aim of the proposal was to address the challenges and opportunities identified through SWOT analysis as a means to guide the establishment of general ICU within the hospital.

Challenges:

Despite significant service expansion in the past year, the critical care service in Ethiopia is still in its early stages. As a critical care service is an emerging type of care in the country, it was challenging at that time to prioritize such services, while other pioneer departments in the ALERT hospital were also requesting service expansions. The ALERT Hospital has limited infrastructure suitable for the establishment of intensive care units, as evidenced by the trauma ICU, in which three neurosurgical patients were being admitted at a time in a 20-m2 room, with significantly compromised quality of care. In addition, the limited availability of human resources as well posed a significant challenge in establishing the ICU. At that time, there were 1 emergency medicine and critical care physician, 2 internists, 1 anesthesiologist, 1 general surgeon, and 4 critical care nurses were engaging in managing critical patients. There was also shortage of supplies, like basic equipment for patient resuscitation, and almost no emergency drugs, both in the pharmacy, emergency unit, and ICU, creating a strain in the provision of quality care. In terms of capacity building, the well-known ALERT Hospital training center was not providing emergency and critical care-related training, although it is well versed in providing TB/HIV and dermatology training.

Opportunities:

The Ethiopian Ministry of Health was well committed to expanding emergency and critical care services by designing a national strategy to expand these services across the country.[10] Moreover, the then-ALERT Hospital senior management team was a significant input and the pivot of the change during the establishing process of the new ICU. The ALERT Hospital senior doctors, general practitioners, nurses, and other supportive staff were also energetic and cooperative to contribute to the success of the project in all aspects. The ALERT Hospital Training Center was also one of the major contributing departments by facilitating trainings for health professionals and easily incorporating critical care training into its objectives.

Quick Win:

Quick Win was a budgeted program designed by the Ethiopian Ministry of Health, focusing on identifying hospital gaps and providing intervention packages based on priority and convincing evidence from quality assessment results. The quick-win initiative is a platform that increases regular communication, information exchange, and stock redistribution among Ethiopian Pharmaceuticals Supply Agency (EPSA) warehouses and health facilities.[11] It was implemented for a while and later scaled up to incorporate national hospitals in a more sustainable manner. Based on the SWOT analysis and suggested proposal, the ministry has been convinced and fully engaged by leading the project and providing the renovation budget, mechanical ventilator, equipment, and medications for the new ICU as part of the quick win initiative objectives.

Infrastructure:

The ALERT Hospital had three staff cafeterias, of which the largest one is located in front of the emergency unit. The structure and proximity of the building makes it easily accessible and possible to renovate to be used for ICU service. However, since the cafeteria was there providing staff service for a very long period of time, it was challenging to bring for discussion the idea of repurposing the cafeteria into an ICU. After a detailed evaluation with the general service director about the technical possibility of changing the cafeteria to an ICU, the request has been submitted to senior management for discussion. Following extensive discussions with the hospital staff and stakeholders, a collaborative effort was made to devise a solution that included relocating the staff cafeteria to a different area and initiating the renovation process.

Human resources:

The ALERT hospital general practitioners and nurses were willing to take national ICU care training to work in emergency and ICU settings. Trainers were invited from different hospitals and delivered comprehensive ICU care training to a total of 25 doctors and nurses. The training lasted for about 1 month, which was 3 weeks of class room lectures and skill sessions and 1 week of onsite training in the ICU on the patient side. The trainee took onsite training at St. Paul Hospital and ALERT Hospital, attended by senior physicians and trained nurses.

The final outcome:

After three months of thorough coordination of all contributions, a general ICU with seven beds, five mechanical ventilators, and two noninvasive ventilators was established in 2018. The ICU provides care for any critical patient fulfilling admission criteria, with no age limit. It operates as a closed-type and run by emergency and critical care physicians, with the involvement of multidisciplinary consultations from different departments. In the initial six months following its establishment, a total of 98 patients were admitted, and later the number of admissions gradually increased over time after advocacy done by the Ministry of Health and the hospital. For the first time, ALERT Hospital started to report the weekly audit of the ICU to the Ethiopian Ministry of Health making a significant milestone. Moreover, the achievement was also counted as one of the success stories of quick win project after the then-state minister came and inaugurated the service commencement.

The second phase of service expansion:

Today, the ALERT Comprehensive Specialized Hospital has one of the largest public intensive care units in the capital city. The second phase of the expansion was in the year of 2022, and it involved the establishment of new state-of-the-art

infrastructure, training of multidisciplinary human resources, and enhancement of quality of service by providing supplies. Currently, the hospital has general ICU with 12 beds, 12 mechanical ventilators and 2 isolation beds; and the unit is being managed efficiently by specialist and sub specialty level clinicians and master's nurses. The service covers about 393,340 patients visiting the hospital annually, with the last annual ICU admission report of 349 critical patients. Meanwhile, the first general ICU was committed to providing care for only pediatric patients, and the hospital has finally got two ICUs, a general and pediatric ICU.

After the establishment of the ICU, the trend of routinely referring patients with complex medical conditions to other hospitals has changed. In addition, challenges such as canceling major surgeries and unnecessary referral of surgical patients only due to a lack of ICU beds have been solved. Currently, ALERT Hospital is one of the biggest hospitals, receiving a large number of referred critical patients and providing excellent patient care by highly skilled and experienced critical care nurses and other healthcare professionals. This critical care service expansion project contributed to the national plan to address gaps in the quantity, distribution, organization, and provision of critical care services in Ethiopia. At the hospital level, the consequences of delays in the provision of critical care and suboptimal patient outcomes have improved since the establishment of the ICU. Moreover, the new ICU has been serving as part of surge capacity during emergencies or disasters, such as natural disasters or mass casualty events. This was demonstrated by the contribution of this service in managing the sudden surge in the number of critically ill patients requiring intensive care services during the pandemic.

Limitation of the study

This case study is specific to an experience in a particular single setting, which may not provide a comprehensive understanding of the subject. As a result, it is going to be challenging to generalize the recommendation from this single finding to other similar settings. In addition, this report shows the progress of the critical care service expansion over the last five years, relying on limited data sources. This may introduce bias and affects the validity and verification of the findings.

4. Conclusion

Establishing a new system and service expansion in the health care system is a complex process that requires an in-depth analysis of the magnitude of the problem and making sure suggested solutions are seamlessly integrated with the hospital's existing systems. Furthermore, introducing new services to an organization presents different sets of challenges, especially in developing countries where there are gaps in awareness and most of the hospitals are already operating on a tight budget. Hospital management is a crucial component in the long-term sustainability of the new services, as evidenced by the current status of ALERT critical care services. Still, critical care services are not readily available, despite the dire need for one of the most populated countries in Africa. The Ethiopian Ministry of Health should keep up with the pace of establishing new ICUs in the country, and hospitals should work on delivering quality service and ensuring the sustainability of the service.

5. Recommendation

Ensuring effective communication and collaboration is essential when establishing a new system or expanding services in the health care system. This task is expected from both clinicians and hospital administrators. The clinicians should conduct a thorough need assessment to determine the demand for any new service and provide enough evidence that the existing health facility meets those needs. The hospital administration and stakeholders should develop a

detailed plan outline and fully engage in realizing the plan for the successful operation of the new system. Finally, every step taken while engaging in such a project should be recorded using a different data capture method to ensure the reliability of the progress report.

Abbreviation

ALERT: All Africa Leprosy, Tuberculosis, and Rehabilitation Training Center
CEO: Chief Executive Officer
ICU: Intensive Care Unit
SWOT: Strengths, Weaknesses, Opportunities, Threats
TB/HIV: Tuberculosis/Human Immunodeficiency Virus

Competing interests

The author declares that he has no any competing interests and no funding source to run the study.

Acknowledgments

I would like to thank Dr. Bethelhem Kassa Bayou (BDSc., DDM, MPH.) for her help in editing the paper.

References

1) "ALERT", Encyclopaedia Aethiopica, vol. 1, edited by Siegbert Uhlig, p. 194,195. Wiesbaden: Harrassowitz.
2) WHO, All Africa Leprosy, Tuberculosis and Rehabilitation Training center, June 2002
3) Addis Ababa, Ethiopia
4) https://alerthospital.gov.et/department
5) kazibwe J, Shah HA, Kuwawenaruwa A, Schell CO, Khalid K, Tran PB, Ghosh S, Baker T, Guinness L. Resource use, availability and cost in the provision of critical care in Tanzania: a systematic review. BMJ Open. 2022 Nov 22;12(11): e060422.
6) FDRE Ministry of health, intensive care unit implementation guideline, 2018, p-1
7) kifle F, Boru Y, Tamiru HD, et al. Intensive Care in Sub-Saharan Africa: A National Review of the Service Status in Ethiopia. *Anesth Analg*. 2022;134(5):930-937.
8) FDRE ministry of health, Health Management Information System (HMIS) / Monitoring and Evaluation (M&E) Strategic Plan for Ethiopian Health Sector, 2008.
9) Huluka DK, Ashagrie AW, Gebremariam TH, Ahmed HY, Kebede RA, Binegdie AB, Gebrehiwot KG, Tadesse M, Sultan M, Dode WW, Tumebo AA, Abayneh A, Seman Y, Firew T, Sherman CB, Schluger NW, Haisch DA. Strategic response to COVID-19 in Ethiopia. Public Health Action. 2022 Dec 21;12(4):191-194.
10) Siddiqui S. Mortality profile across our Intensive Care Units: A 5-year database report from a Singapore restructured hospital. *Indian J Crit Care Med*. 2015;19(12):726-727.
11) FMOH. Health sector transformation plan. Addis Ababa: Federal Ministry of Health of Ethiopia, 2019. Accessed June 3, 2021. https://www.moh.gov.et/ejcc/am/node/152.
12) Ethiopian Ministry of Health, Performance report, Responsive health system in the new beginnings, 2013 EFY (2020/2021), P-129