QUALITY OF HEALTHCARE IN ACUTE PAEDIATRIC CARE UNIT IN A TERTIARY HOSPITAL IN TANZANIA: A CASE OF MUHIMBILI NATIONAL HOSPITAL

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By

Aleya Zulfikar Remtullah

A Dissertation Submitted in (Partial) Fulfilment of the Requirements for the Degree of Master of Medicine (Paediatrics and Child Health) of

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CERTIFICATION

The undersigned certify that they have read and hereby recommend for acceptance by Muhimbili University of Health and Allied Sciences a dissertation entitled: **''Quality of healthcare in acute paediatric care unit in a tertiary hospital in Tanzania: A case of Muhimbili National Hospital'',**in (partial) fulfilment of the requirements for the Degree of Master of Medicine (Paediatrics and Child Health) of Muhimbili University of Health and Allied Sciences.

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DECLARATION AND COPYRIGHT

I, **Aleya Zulfikar Remtullah**, declare that this **dissertation** is my own original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

Signature…… **Date**…….....

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I would like to begin, with great humility, to thank Almighty God for His countless Blessings and guidance without which this dissertation would not be complete.

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I am thankful to my family, my partner and friends who have stood by me through this time and for their prayers and support.

DEDICATION

My loving family, my partner and my dear family and friends

ABSTRACT

Background

Quality of care provided in critical care unit, is vital in contributing to the outcome of critically ill children. Different studies provide mixed conclusions on the quality of care provided, and its influence on the outcomes. Little is documented especially for the case of children admitted in acute units at tertiary hospitals in Tanzania.

Objective

To assess the quality of healthcare in Acute Paediatric Care Unit (APCU) at Muhimbili National Hospital between July and September 2017.

Methodology

A case study that employed both qualitative and quantitative methods was used to gather information among the caregivers and healthcare providers over a period of three months.

It involved a sample size of 107 participants who were consecutively enrolled. Readmissions within seven days of discharge and health care providers who rotated for less than two weeks were excluded from the study.

All components of the Donabedian model of quality of care were assessed.

Methods used in this work included observation, Key Informant Interviews, the use of semi structured questionnaires and document analysis to obtain the information required.

Results

These were summarized into five categories of outcome, structure, process, feedback and recommendations as guided by the Donabedian model. The participants included all caregivers whose children were >28 days and <_14 years of age admitted in APCU, 17 Healthcare providers who worked in APCU during the duration of this study and 90 Caregivers who consented.

The outcome revealed majority of the children admitted, were between the ages of 1 month-4 years 68(75.6%), 46(51.1%) were males, from within Dar-es-Salaam 70(77.8%). Of the total admissions, 66 (73.3%) survived to discharge, while 24(26.7%) died within APCU.

Of those who died, a significant number 10(41.7%) passed away in the first 24 hours of admission. The median age of children admitted was two years (interquartile range 58.5months) and the median duration of stay was five days, with a minimum of 4 hours and a maximum of 32 days.

Most of the underlying causes of death, 17(70.8%), were infectious with septicaemia 13(76.5%) being the most common. Septic shock accounted for majority 9(60%) of the immediate causes of death.

From the caregivers that consented, most reported to be VERY SATISFIED (37.8%) and SATISFIED (24.4%), collectively, with the quality of services provided. Although, a comparable number 34(37.8%) of caregivers refused to comment on this.

Structure; based on observations made, the physical setting in APCU had the basic requirements for management of critically ill children but lacked in major areas in terms of infrastructure, qualified healthcare providers trained in critical care, updated treatment guidelines, had a shortage of functional emergency equipment and emergency drugs. Caregivers reported an unsupportive environment during their stay.

Process; the admission process was noted to be thorough and consistent for every patient that arrived at APCU. Some setbacks were noted. Delays in the referral process and HCP training were amongst some matters that required attention.

Feedback process had major discrepancies between caregivers and healthcare providers.

Conclusions and Recommendations

Although majority 66(73.3%) of patients survived to discharge, a significant number of patients died within APCU. Most of the deaths occurred during the night shift indicating the shortage of staff during this time. Also, most of the deaths were a “Transfer in” signifying the delay in decision making process. Median duration of stay was five days.

Despite the basic structure that existed, there were several enhancements required for provision of quality services to critically ill children in APCU.

The admission process revealed an immediate response time to initial evaluation as well as emergencies. In patient care had some strengths as well as weaknesses and staff knowledge and practices need to be refreshed especially for PBLS.

Finally, none of the caregivers noted to be dissatisfied with the quality of services provided, although a substantial number 34 (37.8%), did not comment.

In general, the overall quality of care needs to improve substantially for a standard, acceptable and consistent quality of care in our setting.

MUHTASARI

Utangulizi

Ubora wa huduma ya afya inayotolewa katika vitengo maalumu ni jambo muhimu katika kuchangia matokeo ya kupona kwa watoto wanaougua. Tafiti kadhaa zimeonesha mahususiano baina ya ubora wa huduma ya afya inayotolewa na namna inavyoweza kuchochea matokeo. Kwa Tanzania kuna uhaba wa taarifa za kitafiti kuhusu matokeo ya watoto wanaolazwa katika wodi maalumu.

Lengo

Kutathimini ubora wa huduma ya afya inayotolewa kitengo cha huduma ya dharura kwa watoto katika Hospitali ya Taifa ya Muhimbili kati ya mwezi wa Julai hadi wa Septemba, 2017.

Mbinu

Utafiti huu ulihusisha mbinu zote mbili uainishaji-qualitative na upimaji-quantitative katika kukusanya taarifa kwa wauguzi na watoaji huduma ya afya katika kipindi cha miezi mitatu. Ilijumuisha washiriki takribani 107. Hii ilifanyika kwa njia ya mwendelezo wa uorodheshwaji wa washiriki kwa kadiri ya upatikanaji. Donabedian modeli ilitumika na vielelezo vyote ya modeli hii vilitumika katika tathimini. Ilihusisha pia uchunguzi, uhoji wa wakuu wa idara na pia ilitumika dodoso maalumu na marejeo ya nyaraka mbalimbali katika kupata taarifa. Wagonjwa waliojirudia kulazwa ndani ya siku saba na wahudumu wasiohusika kutoa huduma kwa zaidi ya wiki mbili, hawakuhusika katika utafiti huu.

Matokeo

Yameelezwa katika makundi matano yaani, Matokeo, Mfumo, Mchakato/Hatua, Mrejesho na Mapendekezo kama inavyoinishwa na modeli ya Donabedian. Matokeo yanaonyesha watoto waliolazwa walikuwa na umri kati ya Mwezi 1 – Miaka 4,ambao ni sawa na 68(75.6%), wengiwao ni wanaume 46(51.1%) ambao kutoka Dar es salaam 70(77.8%). Kati ya watoto wote waliolazwa, 66(73.3%) walipona na 24(26.7%) walikufa wakiwa APCU.

Kwa wale waliokufa wengi wao 10(41.7%) walikufa katika kipindi cha masaa 24 ya kwanza tangu walipolazwa, Wastani wa umri wa watoto waliolazwa ni miaka 2, and wastani wa muda wa kukaa ulikuwa chini ya masaa 72, muda mdogo zaidi wa kukaa ni masaa 4 na muda mrefu zaidi ni siku 32. Sababu kubwa zaidi ya vyanzo vya vifo 17(70.8%) ilikuwa kuambukiza, na Septisemia 13 (76.5%). Vifo vingi vya dharura (au ghafla) vilitokana na magonjwa ya maambukizi (infectious) 15(62.5%), septicaemia (ambukizo zilizoenea kwenye damu) ikiongoza kwa asilimia 9(60%).

Wahudumu wa afya walionyesha kuridhishwa na mwenendo wa ubora wa viwango vya huduma ya afya kwa 34(37.8%). Japo kuna uwiano baina ya waliotoa maoni na wasio toa maoni kuhusu kiwango cha ubora wa huduma.

Hata hivyo miundombinu katika APCU inahitaji mpangilio mahususi kwaajili ya kukidhi viwango vya huduma kwa watoto wenye matatizo ya kiafya makubwa na magumu. Kumeonekana kuna upungufu wa miondombinu, na vifaa tiba kwa ajili ya watoto, uhitaji wa mafunzo kwa watoa huduma ya afya, pia hakuna miongozo ya kisasa ya utoaji tiba, Pia kuna upungufu wa vifaa tiba na dawa za dharula. Kuna changamoto zilizowasilishwa na kulalamikiwa mfano kucheleweshwa kutolewa kwa rufaa kwa wagonjwa, na Mafunzo kwa ajili ya kuongeza uzoefu kwa wahudumu wa afya, na ni miongoni mwa vitu vinavyohitaji kutatuliwa. Mchakato wa utoaji mrejesho baina ya wahudumu wa afya na wauguzi ulikuwa na mapungufu.

Hitimisho na Mapendekezo

Matokeo ya utafiti yanaonyesha 66(73.3%) ya wagonjwa walifanikiwa kunapona na 24(26.7%) walikufa wakiwa APCU. Kwa wagonjwa waliokufa, wengi wao walikufa ndani ya masaa 24 tangu walipofika katika wodi ya matibabu. Wastani ya masaa ya kukaa yalikuwa chini ya 72.

Mfumo ulikuwa na namna mahususi za kushughulikia kesi kubwa na hatarishi kwa watoto, lakini ulikuwa na mapungufu. Licha ya mfumo kuwa na mapungufu lakini ulipewa kipaumbele kwani ndio uliokuwa unaonekana unafaa. Hakuna mlezi asiyeridhika na ubora wa huduma zilizotolewa na wauguzi. Kwa ujumla,ubora wa huduma ya afya inahitaji maboresho, hasa kuongeza ubora wa viwango vya huduma katika maeneo ya kazi.

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LIST OF ABBREVIATIONS

APCU	Acute Paediatric Care Unit
CAHPS	Consumer Assessment of Health Care Providers and Systems
CG	Caregiver
DSM	Dar-es-salaam
ETAT	Emergency Triage Assessment and Treatment
HCP	Health Care Providers
ICU	Intensive Care Unit
KII	Key Informant Interview
MUHAS	Muhimbili University of Health and Allied Sciences
MOH	Ministry of Health
MNH	Muhimbili National Hospital
MOHSW	Ministry of Health and Social Welfare
MOHCDGEC	Ministry of Health, Community Development, Gender, Elderly and Children
PICU	Paediatric Intensive Care Unit
PBLS	Paediatric Basic Life Support
PALS	Paediatric Advanced Life Support
QIHS	Quality Improvement of Health Services in Tanzania
QOC	Quality of Care
TZ	Tanzania
WHO	World Health Organization

DEFINITION OF TERMS

Acute care: the most time sensitive, individually oriented diagnostic and curative actions whose primary purpose is to improve health.

Critical illness: any severe problem with the airway, breathing or circulation, or acute deterioration of conscious state. It includes apnoea, upper airway obstruction, hypoxemia, central cyanosis, severe respiratory distress, total inability to feed, shock, severe dehydration, active bleeding requiring transfusion, unconsciousness or seizures

Intensive care: a service for patients with potentially recoverable diseases who can benefit from more detailed observation and treatment than is generally available in the standard wards and departments

Quality of care: the degree to which health care services for individuals and populations increase the likelihood of desired health outcomes and are consistent with the current professional knowledge

Healthcare provider: is an individual who provides preventive, curative, promotional or rehabilitative healthcare services in a systematic way to people, families or communities.

Caregiver: is someone who is responsible for looking after another person. E.g. with a disability, is ill or very young or old.

Caregiver satisfaction: is a measure of extent to which a patient/caregiver is content with the health care that they/their patient received from their healthcare provider.

Bereavement counselling: counselling provided to someone after the loss of a loved one.

Donabedian model: is a conceptual model that offers a framework for evaluating quality of healthcare. It entails three major domains; Structure, Process and Outcome.

Structure: entails all factors that affect the quality of services/healthcare delivered.

Process: encompasses all the actions that convey quality healthcare.

Outcome: entails all the effects of quality healthcare on the patients/caregivers/population.

CHAPTER ONE

1.0 INTRODUCTION AND BACKGROUND

It is well established that children with acute and severe illness, require intensive critical care(1). However, the quality of such care will affect the outcome of these children. Thus, in provision of services to these children in the critical care unit, attention was drawn towards the quality of care.

Looking at the most common causes of death in children under-5-years, these were found to be pneumonia, diarrhoea and malaria(2) Whereas, malnutrition accounted for 50% of the underlying causes of death (2). Although these deaths were preventable, the delay in recognition, late presentation, lack of resources, and illness severity caused a third of patient deaths. These occurred within the first 24 hours of hospitalization(3). In resource-limited settings, the reduction in child mortality rates would be made possible if there were development of effective paediatric emergency and critical care services(4)

A glance at acute care, it was defined as "…. the most time-sensitive, individually-oriented diagnostic and curative actions whose primary purpose is to improve health"(5)Thus, acute care in any settings around the world entailed the most important aspect of time-sensitivity, regardless of the disease condition.

Globally, acute care involved a variety of health care functions such as emergency medicine, trauma care, acute care surgery, critical care, urgent care and short-term inpatient stabilization(5). Acute care and critical care were interdependent and together, their sole purpose was to improve health.

Looking at paediatric critical medicine, it faced a lot of struggle to establish itself. The first paediatric critical care unit was opened at the Children's Hospital of Goteborg in western Sweden, 1955(4). The following years saw the changes in care models, recognition of sub specialties and fellowship training programs.

The current practice of acute care in Tanzania under the referral system entailed, most children were first attended at a primary healthcare setting and given pre-hospital care. Thereafter, they were taken to the emergency department where they were resuscitated and then stabilized. Upon stabilization, they were then dispatched to the appropriate units such as the critical care unit where they were received by a team of trained staff who were involved in management of this child. Here, the child was evaluated and managed based on observation, history, physical examination and investigations. As soon as the child was stable and out of critical state, he/she was then dispatched to the general wards where continued rehabilitation and preventive education was on-going until the child is fit for discharge.

1.1 Statement of the problem

In an ideal situation, QOC in services provided, increased the likelihood of a positive desired health outcome and minimized preventable deaths. It entailed all the six domains including effectiveness, efficiency, equity, patient centeredness, safety and timelessness(6). These domains were assessed using the Donabedian model of structure, process and outcome.

That being noted, when comparing the mortality rates across the world, significant differences were observed. The average PICU mortality rate in Latin American countries was 13.39% compared with 5.4% in European countries(7). The mean PICU mortality rate in Turkey was reported to be 14.6%(7). PICU mortality at the Red Cross War Memorial Children's Hospital (RCWMCH) in Cape Town, however, had declined from 10.6% in 2006 to 9% in 2010(7). The mortality rate of children admitted to general ICU facilities in other African countries was far higher than the RCWMCH experience, ranging from 36% to 40% (7)

In our setting, a compiled annual mortality report of APCU produced by the Head of Paediatrics Department MNH, revealed a trend over the past 3 years. The following were the proportions of mortality from 2014 to 2016. Beginning with 2014, the proportion of mortality was 41.4% followed by 39.2% in 2015 and finally 45.3% in 2016. This showed that there was a significant rise in mortality in children admitted in APCU. Together with this, those admitted during 2014 and 2015, majority died within 24 hours of admission. Those admitted during 2016, most of the children died within 24 hours as well, though data obtained was missing information for 10 months of the year.

In conclusion, most of the children admitted in APCU died within 24 hours of admission and the proportion of children dying was on the rise. Thus, there was a need for this study and more research in this area, to realize the urgency of the problem at hand.

In Tanzania, a baseline survey on quality of paediatric care was done by the Ministry of Health and Social Welfare(MOHSW) in November 2010,which revealed that not only was the overall quality of care poor, but several areas of care raised concern. These areas included availability of standard treatment guidelines, essential medicines, equipment, availability of

appropriate and adequate human resources and standards for qualified staff amongst others. (8)

Despite several studies being conducted on QOC provided to children, most of them focused on parents and patient satisfaction(9)(10)(11). Others focused on nurses' perspectives in critical care and trauma(12).

Although some studies were based on in-patient care, (9)(10)(11)(12), very little was known about QOC in children admitted in critical care unit especially at MNH in DSM.

This was an important part of childcare, thus, making it the focus of my study.

1.2 Literature Review

1.2.1 Critical care and PICUs

Critical illness was defined as “any severe problem with the airway, breathing or circulation, or acute deterioration of conscious state. It includes apnoea, upper airway obstruction, hypoxemia, central cyanosis, severe respiratory distress, total inability to feed, shock, severe dehydration, active bleeding requiring transfusion, unconsciousness or seizures” (13)

Intensive care was defined as “a service for patients with potentially recoverable diseases who can benefit from more detailed observation and treatment than is generally available in the standard wards and Departments” (14)

Critical care and intensive care have been traditionally used interchangeably over the past few decades. Although structurally there might be differences in these two settings. Paediatric Intensive Care Unit (PICU)is a specialized unit in a hospital that cares for critically ill children. There are generally two levels of paediatric critical care. Level 1 PICU provided care for the most severely ill patient population. It varied in size, personnel, physical characteristics, and equipment, and they differed in the types of specialized care that were provided (e.g. transplantation or cardiac surgery)(15)

Level 2 PICU provided care for children with moderate severity of illness. It was where stabilization of critically ill patients took place before being transferred to Level 1 PICU. It differed from Level 1 PICU in that, it didn’t require a full spectrum of subspecialists or as much hospital resources. (15)

The aim of the PICU service was to provide care for the critically ill or injured child. These included those recovering from elective surgery and that care was delivered (15)

Some centres had four levels of paediatric intensive care. These included; • Level 1: high dependency care • Level 2: intensive care (simple) • Level 3: intensive care (complex) • Level 4: highly specialized intensive care. (16)

In the PICU, there were several scoring systems used to make triage and assessment but were limited to use in predicting prognosis in individual cases. There were several that were in use in PICU. These included;(17)

a) Organ specific systems, e.g. Glasgow coma scale or croup score
b) Mechanism of injury system e.g. paediatric trauma score or injury severity score
c) Paediatric systems e.g. Paediatric Index of Mortality (PIM) and Paediatric Risk of Mortality (PRISM).

Since this study focused on QOC, we take a look at the outcomes, impact of structure, evaluation, emergency and inpatient care as well as satisfaction of patients admitted in PICUs.

1.2.2 Outcomes of children admitted in PICU

There is a vast variability in the way critical care practices are taking place all around the world. This affected the outcome to a great extent.

A study done by Teshome et al in 2015 in Ethiopia, revealed that the leading cause of admission and death in children, admitted in ICU, was trauma(18). Post-operative and medical causes also contributed to a certain extent. The overall mortality rate was noted to be 40% in this setting. The outcomes ranged from death or survival to discharge with morbidity due to trauma.(18)

Another meta-analysis done by Hendrika et al in 2007, revealed that the survivors of PICU faced physical and psychological sequelae(19). In this study, survivors of cardiothoracic surgery and trauma were excluded. These sequelae were noted to interfere with the quality of life of these survivors. Some of the physical sequelae included, neurological, cardiac, renal and pulmonary changes. While psychological evaluation revealed that both, the parents and the children, portrayed symptoms of post-traumatic stress disorder(19)

On the other hand, due to a well-equipped PICU in developed countries, the mortality rates were noted to be much lower. A study done by Burns et al in 2014 in five teaching hospitals across United States, revealed an overall mortality rate of 2.39%(20). Majority of the patients

died due to a with-holding or a withdrawal from life-sustaining treatment, a few were brain dead and 14% died due to unsuccessful resuscitation attempts(20)

All in all, the common denominator in terms of outcomes was either survival to discharge (with or without morbidity) or death. For those who survived, the quality of life ranged from normal to poor, while others had psychological and permanent physical sequelae. For those who died, the difference in the overall mortality rates was noted across the world. This was primarily due to the structure and its contribution to the outcome.

1.2.3 Impact of structure on QOC in children admitted in PICU

Based on the general overview of the PICU standards noted above, the structure plays a pivotal role in provision of quality services.

This was established by Randolph et al where they concluded that well equipped intensive care units staffed with intensivists had better outcomes(21)

Structures in PICUs vary from one country to another. A glance at the Children's hospital in Michigan USA, a 32-bed unit, which provide care to patients admitted, following an admission criteria that included, but was not limited to; acute respiratory failure; fulminant infectious disease and sepsis; traumatic head injury; status epilepticus; oncologic complications including care of children following bone marrow or stem cell transplant; inborn errors of metabolism; and poisonings (22)

The ICU also provides post-operative care following high-risk surgical procedures including neurosurgery, orthopaedic spinal surgery, airway reconstruction, surgery for complex congenital heart disease. (22)

In developed countries, such as the United States of America, the American Academy of Paediatrics developed admission criteria in 1999 which was indorsed in 2008. These criteria included; (23)

1. Severe, life-threatening, or unstable cardiovascular, neurologic, hematologic/oncologic emergencies
2. Endocrine/metabolic, gastrointestinal, renal and/or multisystem disease

3. Postoperative patients requiring frequent monitoring and potentially requiring intensive intervention
4. Conditions that necessitate the application of special technologic needs, monitoring, complex intervention, or treatment, including medications associated with the disease that exceed individual patient care unit policy limitations.(23)

The daily practice of acute care units in developed countries varied from one country to another. The critical care unit team usually entailed members that had some form of acute care training. This ensured provision of better and quality healthcare services in these settings. But once again, that varied with the limited resources and staffing capacity.

Looking at developing countries such as Kathmandu in Nepal, a study done by Sangita et al in 2011 at Patan Academy Health sciences, noted several challenges they faced while developing their Paediatric ICU in the resource poor settings(24).Some of those challenges included the lack of appropriate equipment, medications, skilled personnel, technology as well as electricity and water supply shortages.

In Nepal, like other developing countries, the health care model involved “fee-for-service”. This meant that the patients were responsible for the medications, interventions and investigations(24). This had proven to be a burden to the families, as in Nepal, the average working family earned less than one US dollar a day.

Staffing the PICU was a challenge as well due to low average salaries which caused most of the trained staff to migrate to Western countries or to private institutions(24)

The PICU had less than 25 beds which also proved to be a burden as there was an overwhelming number of critically ill patients in Nepal due to inadequate preventive care.

The admission criteria for ICU in Nepal, involved those patients with a reasonable chance of recovery, on whom resources would be expended. This meant that, terminally ill patients with cancer or those with poor neurologic outcome were not admitted to the units. This proved to be ethically challenging and thus was a ”grey zone” for this matter (24)

One major factor that contributed to poor quality of health care in developing countries was the huge lack of resources. This meant that less money was spent on health budgets in developing countries(24). Countries such as Uganda, Ghana and Pakistan each spent less than US$20 per person per year on health (25)

A glance at Africa, the PICU at the Red Cross War Memorial Children's Hospital is the largest in Africa. The ICU teams dealt with cases ranging from cardiac, neurosurgery, trauma and burns, chronic conditions, tracheotomy cases, metabolic, respiratory and neurological conditions.(26)

The PICU has 22 beds and a well renowned and trained team of ICU intensivists especially for paediatric cases. They also faced challenges such as; trained staff, the ratio of nurses to patients, space and number of beds in relation of the overwhelming number of critical patients amongst others. (26).

In Africa, deficiencies in pediatric critical care were noted to be related to drugs, oxygen, blood products as well as monitoring equipment(27)This contributed to the high mortality rate of 40% in these low-income countries.

In Tanzania, particularly in MNH Dar-es-Salaam, the APCU was established in 1999/2000 in collaboration with the Japanese International Cooperation Agency (JICA). The precise reason for establishing this unit in the department of paediatrics was because, most children that were brought to MNH, passed through a casualty where they were seen by general practitioners before being transferred to the wards.

There were minimal interventions done for a very sick child. Thus, most children (70-90%) who were brought to the wards died within 24-48 hours of admission. The most common cause was respiratory distress.

With the help of JICA, paediatric department of MNH decided to open APCU which contained all the emergency medications (e.g. dextrose 10%, i.v. diazepam), infusion pumps, oxygen concentrators, nebulizers and other equipment. There were also trained staff and permanent registrars located at all times in APCU in case of any emergencies, with a higher

nurse to patient ratio and a functioning laboratory that helped to give immediate results of tests that were done on these critically ill children.

1.2.4 Evaluation, emergency and inpatient care in PICU

As noted above, every country has a different protocol on how they evaluate their patients in PICUs. Developed countries have better resources and staffing that ensure better QOC provision. Developing countries on the other hand, face several challenges including equipment, staffing, and resources amongst others. This inevitably has a direct impact on the outcome.

To understand the differences in inpatient care and evaluation in PICUs around the world, we begin with a glance at the Children's hospital in Michigan USA. Their daily rounds involve a multidisciplinary team which consists of; one ICU attending, one or more ICU fellows, and several rotating general paediatric and emergency medicine residents(22)

In addition, pharmacologists with a Ph.D., also attended rounds with each team each day to ensure optimal and safe pharmacologic management. The critical care unit also provides sedation for procedures including cardioversion, MRI, CT scan among others(22)

In South Africa, there is a trained team of ICU intensivists that rotate in PICU. While in our setting, rounds are done by paediatricians, residents, nurses and interns(26)

The current practice in APCU at MNH entails an almost 1:1 patient to nurse ratio, a rotating paediatric resident as well as a paediatrician that would pass rounds at least once a day, close monitoring of vital signs, feeding care, ambulatory care, stocked emergency medications, oxygen concentrators, continued training of staff for cardiopulmonary resuscitation among other milestones.

Unfortunately, since the end of the collaboration between MNH and JICA, the laboratory services for critically ill children are no longer functional and thus lab specimens needed to pass through the usual route as other patients which brings about a delay in management. Also, in order to have radiological tests on these patients, they need to be manually transferred to the x-ray or ECHO departments with a portable oxygen tank for investigations which is

distressful for patients, caregivers as well as HCPs. These are some of the challenges faced in the APCU during daily patient care and evaluation.

In case of emergencies, according to the international PICU standards, the nurse has a set of instructions to carry out if a child's condition changes in the absence of a physician/paediatrician. CPR is initiated where required and if an anaesthesiologist is needed, they are paged.

All residents and HCPs in PICU are required to be trained in PALS. This course is offered several times a year and a recertification is required at the end of second year. (PICU handbook)

These differences affect the overall care and impact the quality of services provided.

1.2.5 Satisfaction of patients admitted in PICU

Parents/caregivers are the main support system for children admitted in PICUs. Since these children are generally in a critical condition, the level of satisfaction is referred to their caregivers/parents.

Based on a study done by Victoria et al in an Appalachian PICU, it revealed a very high parental satisfaction in correlation to the hospital environment, patient care and communication(28). The above mentioned were the main areas of focus when relating to parental satisfaction.

Locally, a recent study done by Thecla et al in critically ill patients at MNH, revealed that many of the respondents were satisfied with the services they received from the nurses(29). The level of satisfaction with ICU environment scored the lowest. Although this study was conducted in the general ICU and from the nurse's perspective, it reflected the overall level of satisfaction since very little is documented about this topic in relation to paediatric patients.

Several other studies have been conducted in our setting, but mostly related to burn patients and outpatient clinics(11)(12)

1.2.6 Quality of care and Donabedian model

Looking at the other aspect of this study, the quality of care was defined as “the degree to which health care services for individuals and populations increase the likelihood of desired health outcomes and are consistent with the current professional knowledge.” (6)It entailed six domains including effectiveness, efficiency, equity, patient centeredness, safety and timelessness.

As there were two sides of a coin, the other side concerned patient’s/consumer perspectives of patient care. Based on Foundation of Accountability (FACCT) research, they categorized consumer perspectives as; staying healthy, getting better, living with illness or disability and coping with end of life(6)

Quality measurements assessed the relationship between health care (process/structure) and positive health outcomes. Quality of health care in children was measured using a scientifically sound tool to assess the extent to which children were receiving quality health care in any of the domains stated above. During this assessment, “structure, process and outcomes” developed by Avedis Donabedian, M.D, in 1980, was used to measure the above domains. (6)

The Donabedian model was introduced in 1966 by Dr Avedis Donabedian who was born in Lebanon and due to political unrest, moved to USA where he obtained his Masters in Epidemiology and Health Services Administration at Harvard University. He was recruited at New York Medical college and University of Michigan as a researcher and a non-clinical teacher. He then spent the rest of his professional life becoming Nathan Sinai Distinguished Professor of Public Health until his demise in 2000. This conceptual framework has been used in this research as it is the prime model for assessing QOC(30)

The three major domains described by this model entailed structure, process and outcomes. An example of the assessment of the domains of quality health care in a critical care unit involved;

Structure which entailed, presence of life saving equipment and drugs, favourable infrastructure and environment for health care in the critical care unit, updated guidelines of treatment and qualified and trained staff.

Process involved; Diagnosis, treatment, prevention, education and interactions between staff and patient/caregiver.

Outcomes encompassed; Patient satisfaction, mortality and number of days of stay in the critical care unit.

1.2.7 Components of Donabedian model

This model was selected as a framework for evaluating QOC as it has been the most commonly used and is a prime for assessing QOC.

Structure:

In terms of structure, the standard requirement for a PICU varied as a result of differences in hospital architecture, size, space, and design. Most importantly, access to the PICU was monitored to ensure patient and staff safety, privacy and confidentiality.

The PICU had to be located near access points such as the elevators for patient transport, paediatrician call room, family waiting and sleep areas. It was also desirable for PICU to be near the operating rooms, emergency departments and recovery rooms.

Floor plan included rooms for patient isolation, for clean/soiled linens and equipment as well as laboratory area for rapid determination of blood gases amongst others. A room for family counselling or private discussions with the patient's family was also desirable. A room for staff conference was essential as well as a staff toilet and storage area for personal belongings(15)Separate facilities for patient's families, including space for sleeping and bathing, were essential for level I and level II PICUs.

Space was required for medication station, nourishment station, counters and cabinets for documents as well as a computer station where a computerized link to the laboratory was available. A satellite pharmacy in the PICU for provision of routine and emergency drugs at point of order was desirable.

Bedside facilities included; at least 225 ft^2 per patient is required as space in a ward type of setting in PICU. The head of each bed or crib was rapidly accessible for emergency airway management. Electrical power, oxygen, medical compressed air, and vacuum outlets needed to be sufficient in supply and number. On average, in most cases, 12 or more electrical outlets and a minimum of two compressed air outlets, two oxygen outlets, and two vacuum outlets were necessary per bed space. All outlets, heating, ventilation, air conditioning, fire-safety procedures and equipment, electrical grounding, plumbing, and illumination adhered to appropriate local, state, and national codes. Walls or curtains were provided to ensure patient privacy.(15)

Process

When it concerned the "process" component of the Donabedian model, PICU personnel were the core part of QOC. They were responsible for the care of the patient from the point of admission to discharge or death. This entailed overall patient care and management as well as staff knowledge and attitude. Therefore, these personnel required a certain level of qualification to be able to take care of critically ill children. The following were some of the required personnel in PICUs.

A medical director who was board certified in paediatrics and paediatric critical care medicine was essential. If not, a paediatric intensivist was appointed as a co-director.

It was imperative to have a PICU intensivist as it had shown to improve patient care and efficiency(15). An in-house physician at the postgraduate year 3 level or above in paediatrics or anaesthesiology was essential for all level I PICUs. In-house physicians were available for 24 hours to provide bedside care for patients. The physician had credentials for critical/emergency care to critically ill children.

For level I units, available physicians included a paediatric intensivist, a paediatric anaesthesiologist, a paediatric cardiologist, a paediatric neurologist, a paediatric radiologist, a psychiatrist or psychologist, a paediatric surgeon, a paediatric neurosurgeon, an otolaryngologist (paediatric subspecialist desired), an orthopaedic surgeon (paediatric subspecialist desired), and a cardiothoracic surgeon (paediatric subspecialist desired). For level II PICUs, paediatric subspecialists (with the exception of the paediatric intensivist) were

not essential but were desirable, a general surgeon and neurosurgeon were essential, and an otolaryngologist and orthopaedic surgeon were desirable (paediatric subspecialists optional). For level II PICUs, a cardiovascular surgeon was also optional.

A nursing manager who had a master's degree in paediatric nursing or nursing administration was desirable. A clinical nurse specialist or nurse practitioner who had a master's degree in nursing and national paediatric nurse practitioner certification and had completed a preceptorship in the management of critically ill paediatric patients.

All nurses who worked in level I and II PICUs had completed a clinical paediatric critical care orientation before assuming full responsibility for patient care. Paediatric advanced life support (PALS) or an equivalent course was required. Nurse-to-patient ratios was based on patient acuity, usually ranged from 2:1 to 1:3.

A respiratory therapy unit had a supervisor who was responsible for training staff, maintaining equipment and multidisciplinary quality control and care. All respiratory therapists who cared for children in level I and II PICUs had clinical experience managing paediatric respiratory failure and paediatric mechanical ventilators and had training in PALS or an equivalent course.(15)

An appropriately trained and qualified clinical pharmacist was assigned to the level I PICU. A radiology technician (preferably with advanced paediatric training was in-house24hoursperdayin hospitals with level I and II PICUs. In addition, social workers; physical, occupational, and speech therapists; nutritionists; child life specialists; clinical psychologists; and clergy were available.

Outcome

Depending on the "structure" and "process", the "outcome" of the model was affected accordingly. Thus, these ranged from survival to discharge, mortality as well as level of Caregiver (CG) satisfaction. Within these details, we came up with other trends such as median number of days of stay in the PICU and the most common immediate and underlying causes of death in PICUs.

1.3 Conceptual Framework

Figure 1 elaborates on the conceptual framework.

QOC in APCU was dependent on three major components that were interdependent. These included structure, process and outcome.

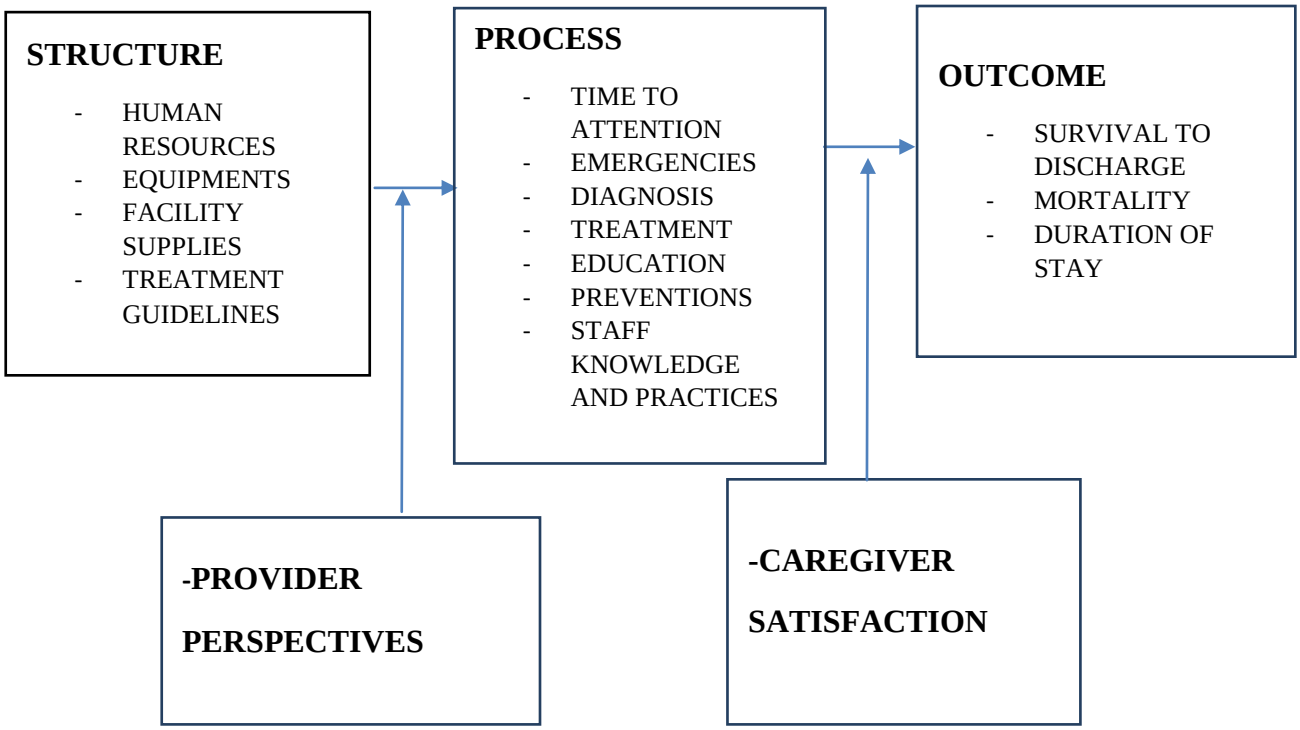
The structure entailed, staff, equipment, facility supplies and treatment guidelines amongst others. This in-turn influenced the process in terms of time to attention, diagnosis, treatment, education, prevention and interaction amongst others.

The outcome observed was also affected based on the structure and process. This was an interdependent cycle.

The provider perspectives and caregiver satisfaction provided an added insight to the components of the model and contributed in identifying the gaps and the positive outcomes.

This study looked at all the three components that entailed the QOC as a unit to provide a more wholesome approach to the subject matter as defined in the study objectives.

Figure 1: Conceptual framework



1.4 Rationale

Despite several studies done around the world regarding quality of care in children, very little is known about the QOC provided in children admitted in APCU.

The mortality rate in APCU at MNH is noted to be on the rise. Thus, there was a need to conduct an in-depth research in this area to realize the magnitude and urgency of the problem at hand.

The study will add to the body of knowledge on QOC and help to contribute in addressing the issues of QOC in our country

It will serve as an eye opener in terms of QOC provided to these children and possible ways to improve on them. This way, through this study, it shall encourage reinforcement for the positive outcomes and enable changes to reduce the negative outcomes.

1.5Research Questions

Some of the pertinent questions that this thesis attempted to enlighten included;

a) What was the magnitude of survival to discharge and deaths among children admitted in APCU during the duration of this study?
b) What was the median duration of stay in APCU?
c) How did the structure affect the QOC provided to children admitted in APCU?
d) How did the initial evaluation, emergency situation, in-patient care and staff knowledge and practices affect the QOC of children admitted in APCU?
e) How satisfied were the caregivers with the quality of care, provided to their child while admitted in APCU at MNH?

1.6Objectives

1.6.1 Broad Objective

To assess the quality of healthcare in children admitted in APCU at MNH over a three-month period.

1.6.2 Specific Objectives

1) To determine the outcomes of children admitted in APCU at MNH, in terms of survival to discharge, death and median duration of stay during the study.
2) To compare the existing structure in APCU, to the local and international standards so as determine the strengths and weaknesses.
3) To assess how the structure impacted the quality of care provided to children admitted in APCU at MNH.
4) To assess the process of quality of care for children admitted in APCU at MNH in terms of initial evaluation, emergency situation, in-patient care and staff knowledge and practices.
5) To describe the level of caregiver's satisfaction of quality of care provided to their children while admitted in APCU at MNH

CHAPTER TWO

2.0 METHODOLOGY

2.1 Study Area

The study was conducted at Muhimbili National Hospital, which is a National Referral and university teaching hospital in Dar-es-Salaam with a 1500 bed capacity. It provided outpatient, emergency as well as in-patient services to an estimate of more than 1000 patients per week(31)It has 29 departments and 107 units. MNH is located in Upanga in the district of Ilala.

This hospital was chosen due to the presence of an APCU in the paediatric department that was well renowned and recognized for its acute care and monitoring as well as trained personnel. In addition, since MNH is a tertiary hospital, it receives patients from different parts of Tanzania, thus allowing a variety of information to be collected.

2.2 Study Design

Case study design that employed both qualitative and quantitative methods to gather information. A case study was necessary as quality of care is a complex phenomenon that is influenced by many factors and it involves social process(32)

Two trained research assistants, who were final year undergraduates in school of medicine at MUHAS, and the primary researcher, conducted the study in APCU at MNH. The assistants were trained over a period of one week.

2.3 Study Participants

The participants included;

1) All care givers of children (>28days and <_14years of age) that were admitted in the APCU at MNH
2) All health care providers who worked in the APCU. This included the attending Paediatric specialists, residents, nursing officers, enrolled nurses and nursing assistants.

2.4 Study Duration

The study was conducted in a period of three months, from July to September 2017.

2.5 Sample Size

On average, the APCU admitted 30 patients per month (N). Study duration was 3 months.

Thus, estimated sample size was;

=N * 3

=30* 3

= 90 participants (caregivers)

- *Yin, R. K. (2006). Case Study Methods. In J. L. Green, G. Camilli, & P. B. Elmore (Eds.), Handbook of complementary methods in education research (pp. 111-122)*

In terms of HCPs, this involved 2 Paediatric specialists, 2 residents, 1 nurse in-charge, 3 nursing officers, 5 enrolled nurses and 4 nursing attendants. Thus, a total of 17 HCPs were conveniently involved in this study for collection of information on QOC.

The estimated sample size for patients admitted was 90 participants. These were included in determining the proportion of those who survived to discharge and those who died in APCU.

In total, the sample size entailed 107 participants. It was a convenient sample size. This was the product of consenting participants. The method used above, was limited to timeframe and was a convenient sample size(32)

2.6 Inclusion Criteria

- All caregivers whose children were >28days and <_14 years of age admitted in APCU (as this was the pre-existing admission criteria in APCU)
- All HCPs who worked in APCU during the duration of this study and
- Caregivers who consented.

2.7 Exclusion Criteria

- Re- admissions into APCU within seven days of discharge(to avoid observer bias) and
- HCPs who rotated for less than 2 weeks in APCU (as they would not be able to provide in-depth information for assessment of their services during this short period of time)

2.8 Sampling Technique

In the group of caregivers, consecutive enrolment was used to extract information from all the caregivers whose children had been admitted in APCU during the duration of this study.

For the HCPs, consecutive enrolment was used to obtain information. This included all the HCPs working at APCU during the duration of this study including Paediatric specialists, residents, nurse in-charge, nursing officers, enrolled nurses and nursing attendants.

Due to the limited number of admissions in the APCU, the researcher recruited all those admitted in the APCU during the duration of the study.

2.9 Data Collection

Since three areas based on the Donabedian model were being assessed, it was vital to define what each component looked at, during the duration of this study.

In terms of structure, the following were assessed;
The presence of favourable infrastructure and environment for health care in APCU, consistent presence of life saving drugs and equipment, availability and presence of qualified human resources i.e. HCPs and presence of an up-to-date treatment guidelines.

This was assessed through observation method by using a checklist from the Quality Improvement of Health Services (QIHS) set of indicators(33), which was a validated tool as well as additional requirements according to international PICU standards and standards by Ministry of Health, Community Development, Gender, Elderly and Children

(MOHCDGEC)(34). Semi structured interviews also contributed to the feedback about structure.

In terms of process, the following were assessed;

Time to medical attention and intervention, management of emergency situations, in- patient care which would include; appropriate diagnosis and timely management and documentation of patient management as well as staff knowledge and practices which entailed; feedback, education, prevention as well as interaction between HCPs and caregiver/patient.

In patient care was assessed by observation of the admission process as well as feedback from the CGs and HCPs (from semi structure interviews and KIIs), on the services their children received while in APCU. Staff knowledge and practice was assessed by observation of daily patient care and during emergency situation (such as during CPR). It was also assessed via the semi structure interviews where general open-ended questions were asked about patient care and emergency situations.

The outcomes of that this study measured the following;

The proportion of children who survived to discharge, proportion of children who died at any point of this study while admitted in APCU, median duration of stay in APCU and level of caregiver satisfaction of the QOC provided. This was assessed through document analysis using available records.

Caregiver level of satisfaction was assessed by use of semi structured questionnaire using a Likert scale that stratified the options as “Very satisfied” “Satisfied” and “Not satisfied” to the quality of services provided. This method allows the strengths of quantitative methods/close ended questions to be combined, in a complementary manner, with the strengths of qualitative/ open ended questions(28). Both these strategies are used to gather in-depth information, measure attitudes and other constructs of interest (Johnson and Turner, 2003)

2.10 Data Collection Instruments and Tools:

Data collection took place in the following manner with the instruments and tools mentioned below;

2.11 Data Collection Instruments

These included;

1) QIHS tool- Scientifically validated set of indicators for QOC., JULY 2015(33)
2) Checklist
3) Semi-structured questionnaire
4) An interview guide for Key Informant Interview (KII)

QIHS tool:

The tool that was used in this study was an adapted form of a checklist from QIHS in Tanzania which was a validated set of indicators for measuring quality of maternal, new born and child health services as well as related hospital services introduced in July 2015.(33)

The set of 306 indicators had been categorized into five domains; Clinical care, communication, management, people, quality and safety.

The indicators had further been categorized according to the Donabedian Model including structure (68), process (136) and outcome (102).

These indicators were modified according to our settings in all three domains so as to meet the above-mentioned objectives.

Twelve Tanzanian hospitals in Lindi, Mtwara, Mbeya and Tanga have been assessed twice based on these indicators(33)

Checklist:

The indicators were used to create checklists that were filled out by the research assistants in observation of structure and process.

This checklist of indicators was also used in constructing parts of the semi structured questionnaires.

Questionnaires:

The caregivers were given a semi structured questionnaire that was filled in immediately following discharge or death in APCU.

The nursing officers, nursing attendants and residents were given a different semi structured questionnaire.

Interview guide:

A modified interview guide that was currently being used at MNH for in-patient services was applied for conducting a KII. This was used to gather information on quality of care provided. It also entailed open ended questions that was retrieved from a Consumer Assessment of Health Care Providers and Systems (CAHPS) hospital survey questionnaire titles(35), QIHS list of indicators, experience of researcher and information from components of the checklist. This created a wholesome interview guide covering all aspects of QOC.

Where participants would deviate from the topic, probing open-ended questions were directed towards them.

The interview guide was pre-tested among caregivers attending paediatric outpatient services.

The interviews ended when researchers were satisfied that the saturation point was reached, that is to say, when no new ideas relevant to our study were foreseen (36)

2.12 Data Collection Tool

This included a recording instrument for the KII and semi-structured interviews.

2.13 Data collection technique

As this was both a quantitative and qualitative study, the data was collected using semi structured questionnaires as well as document analysis (for quantitative data) and observation, KIIs and document analysis (for qualitative data).

Quantitative data:

This data was collected using the semi structured questionnaires given to HCPs and caregivers as well as document analysis of available records.

Questionnaire to caregivers

One research assistant administered the semi-structured questionnaires to the caregivers during the duration of the study and guided them where necessary. This was done upon discharge or death from APCU and was conducted outside this setting i.e. wherever it was convenient for the CG. The semi structured questionnaire included a Likert scale for close ended questions, to be filled in to be able to assess the level of caregiver satisfaction to the QOC provided to their children while admitted in APCU. It also included open ended questions that were recorded for coding purposes.

These questionnaires were designed based on the adapted form of QIHS set of indicators, observation and researcher experience.

Questionnaire to HCPs

The HCPs were given a different semi structured questionnaire so as to obtain information about their perspectives on QOC provided to children admitted in APCU.

These questionnaires were administered after one month into the study to prevent Hawthorne effect(37) and allow fading of social desirability.

The research assistants administered them.

These questionnaires were designed based on the adapted form of QIHS set of indicators, CAHPS, observation and researcher experience.

Document analysis

In quantitative part, the proportion of survival to discharge and deaths as well as median duration of stay in APCU were obtained using document analysis. This was done towards the end of the study by the researcher and analysed accordingly.

Qualitative data

This data was collected using observation checklist, KIIs and document analysis.

Checklists

Two trained research assistants carried out the observation using the checklist developed from the QIHS set of indicators. They were trained and unbiased to the process. They observed daily via the checklist created so as to ensure consistency. The research was conducted at random times of the day to avoid bias and avoid Hawthorne effect

This was done daily over the period of 3 months.

KIIs

In the group of HCPs, KIIs were conducted for the nurse in charge and the Paediatric specialists (those who had rotated in APCU over the last six months).It took place in the natural setting (APCU). The KII entailed an interview guide which involved open ended questions obtained partly from the current validated questionnaire for in-patients at MNH, QIHS set of indicators, CAHPS titles, observations and researcher experience.

The interview lasted approximately forty-five minutes and it was recorded. The main researcher and one assistant who took the necessary notes and reminded the researcher where a probing question was necessary, conducted KIIs.

Document analysis

This was used under qualitative data collection to see documentation in the patient files which was part of the observation process.

This was carried out by the research assistants daily over the duration of this study.

2.14 Quality Assurance

1. After the KII, the trained research assistants listened to the recordings of the interview, discussed and reviewed questions that were difficult to answer and modify them further.
2. Transcription of the KII from the recording device to a word document to ensure consistency was done and re checked for ensuring accuracy and consistency
3. Data entry and cleaning for quantitative data. This helped to look for consistency of all entries.

2.15 Data Analysis

Semi structured questionnaires and document analysis, used to collect quantitative data, were analysed using SPSS Version 20 program.

Quantitative data

Continuous variables were expressed as median and interquartile range while categorical data were expressed as proportions. The quantitative data was analysed in a descriptive manner.

Qualitative data

Data was analysed in a descriptive manner. KII and contents of checklist were analysed using qualitative content analysis with open code software 4.02.

Here, we first transcribed verbatim the audio-recorded interviews and open-ended questions from questionnaires and then translated them from Swahili to English. We analysed the interviews using qualitative content analysis following Graneheim and Lundman (Graneheim & Lundman 2004). We read and re-read the full transcripts and field notes to become familiar with the data and the context. Condensed meaning units were then formed through data reduction. These were related to all three domains of the Donabedian model. From the condensed meaning units, we extracted codes. The author extracted primary codes that were discussed and agreed upon. We grouped similar codes together and through constant comparison, we abstracted them into sub-categories. We finally analysed the sub-categories to

distinguish their similarities and differences. Similar subcategories were sorted to form categories that reflected the manifest content of the text.

2.16 Ethical Consideration

Ethical clearance and permission to conduct this study was sought from MUHAS Senate Research and Publications Committee and MNH administration respectively (Reference numbers are; MU/PGS/SAEC/Vol.IX/ and HD/MUH/T.189/2015). Prior to enrolment, all caregivers and HCPs were informed about the study and asked for consent (written and verbal) to be enrolled. This consent included a clause specific to allow recording of KIIs**.** Since the participants admitted in APCU were mostly critically ill and not in the right state of mind due to their illness, assent (from eligible participants) could not be sought from these children**.** Participants were instructed about the study and consented privately.

2.17 Ethical consideration in sensitive settings

In the unfortunate scenario where the caregiver had lost their child to death, the research assistant politely requested to speak to the caregiver concerning feedback about their experience. In the case they refused to participate, the research assistant withdrew and did not probe further. In the case that they agreed to participate, the research assistant proceeded with the semi structured questionnaire. If a point reached and the caregiver was not comfortable to proceed, the research assistant discontinued to probe further. This helped to identify the positives and shortcomings on the care provided i.e. good and bad experiences.

In the case when a life-threatening situation occurred at any point of this study, the researcher or the assistants shouted for help to draw attention to the seniors in the APCU to intervene as soon as possible. If no response, then the researcher or the assistants intervened to save the life of the patient.

CHAPTER THREE

3.0 RESULTS

From three KIIs with Paediatric specialists and the nurse in-charge of APCU, 106 semi structured interviews with CGs and HCPs, observations and document analysis, we summarized our results into 5 categories of outcome, structure, process feedback and recommendations as guided by the Donebadian model.

3.1 Outcomes

The outcomes analysed during this study-encompassed survival to discharge, death and level of CG satisfaction. We used quantitative approach to analyse the outcomes.

Table 1 summarizes the socio-demographic profile of admitted children in APCU. Sixty-eight (75.6%) of the children admitted were aged between one month and 4 years. The median age of children admitted was two years. Overall, there were more males 46(51.1%) compared to females 44(48.9%).

Looking at the domicile in Table 1, 70 of the participants came from within Dar-es-Salaam (77.8%) and only 20(22.2%) were from upcountry. Of those from Dar-es-Salaam, most originated from Mbagala 7(10%) and Kigamboni 5(7.1%).

Table 1: Sociodemographic Characteristics

	Male	**Female**	**Total**
Age (Years)			
1 Month-4	33 (71.7%)	35 (79.6%)	68 (75.6%)
5-9	5 (10.9%)	6 (13.6%)	11 (12.2%)
10-14	8 (17.4%)	3 (6.8%)	11 (12.2%)
Total	46 (100%)	44 (100%)	90 (100%)
Domicile			
Dar-Es-Salaam	33 (47.1%)	37 (52.9%)	70 (77.8%)
Upcountry	13 (65%)	7 (35%)	20 (22.2%)

Table 2 summarizes the outcomes of children admitted in APCU. More children survived to discharge 66(73.3%) compared to those who died 24(26.7%). Among those who survived, there were no differences in sex noted. Ten (41.7%) of the deaths that occurred in APCU, happened within 24 hours of admission. The median duration of stay was five days with a minimum of 4 hours and a maximum of 32 days. Out of five readmissions, 2 patients met the inclusion criteria, whereas 3 patients met the exclusion criteria (Readmitted within 7 days post discharge).

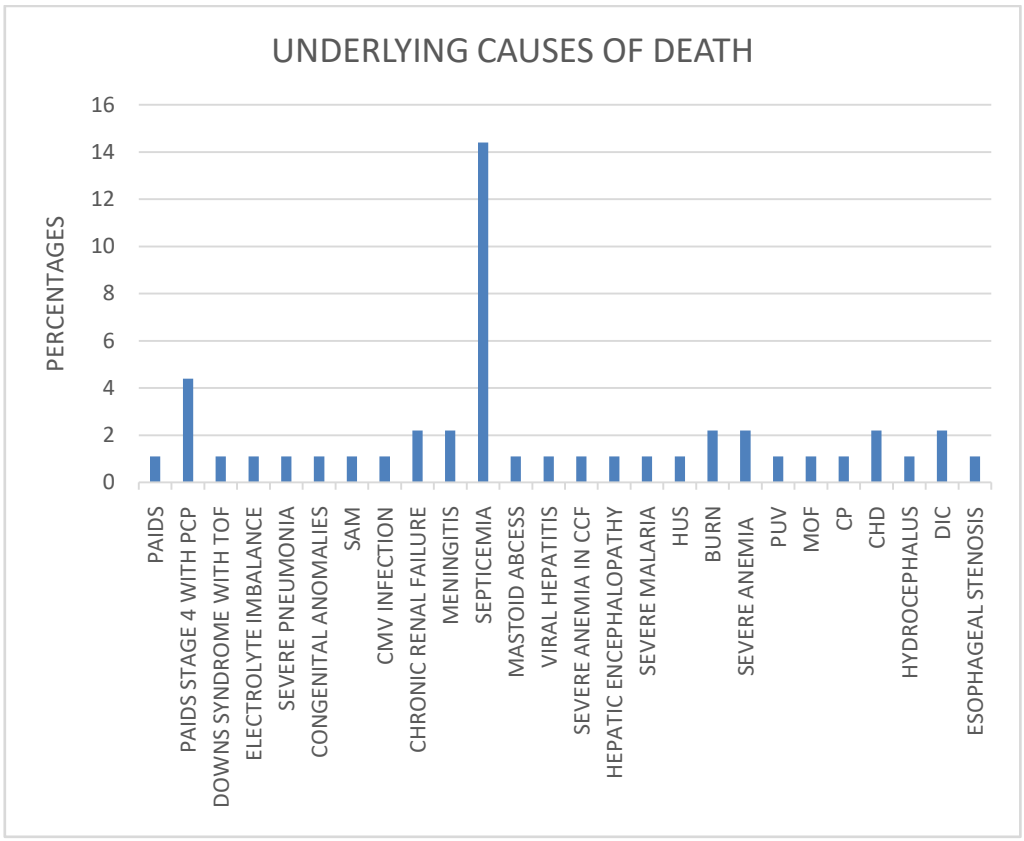
Table 2: Outcomes

	Male	**Female**	**Total**
Death	13(54.2%)	11(45.8%)	24(26.7%)
Survival to discharge	33(50%)	33(50%)	66(73.3%)
Duration of stay			
<24 hours	8 (57.1%)	6 (42.9%)	14 (15.5%)
24-48 hours	10 (66.7%)	5 (33.3%)	15 (16.7%)
48-72 hours	6 (60%)	4 (40%)	10 (11.1%)
>72 hours	22 (43.1%)	29 (56.9%)	51 (56.7%)
Readmissions	2 (40%)	3 (60%)	5 (100%)

Figure 2 summarizes the underlying causes of death in APCU. Most of the underlying causes death, 17(70.8%) were infectious of which the most common infectious cause was septicaemia 13(76.5%). The non-infectious causes of death accounted for 7(29.2%).

There was a male predominance 9(69.2%) for septicaemia as the most common infectious underlying cause. Majority of those with septicaemia were from within Dar-es-Salaam 9(69.2%).

Figure 2: Underlying causes of death

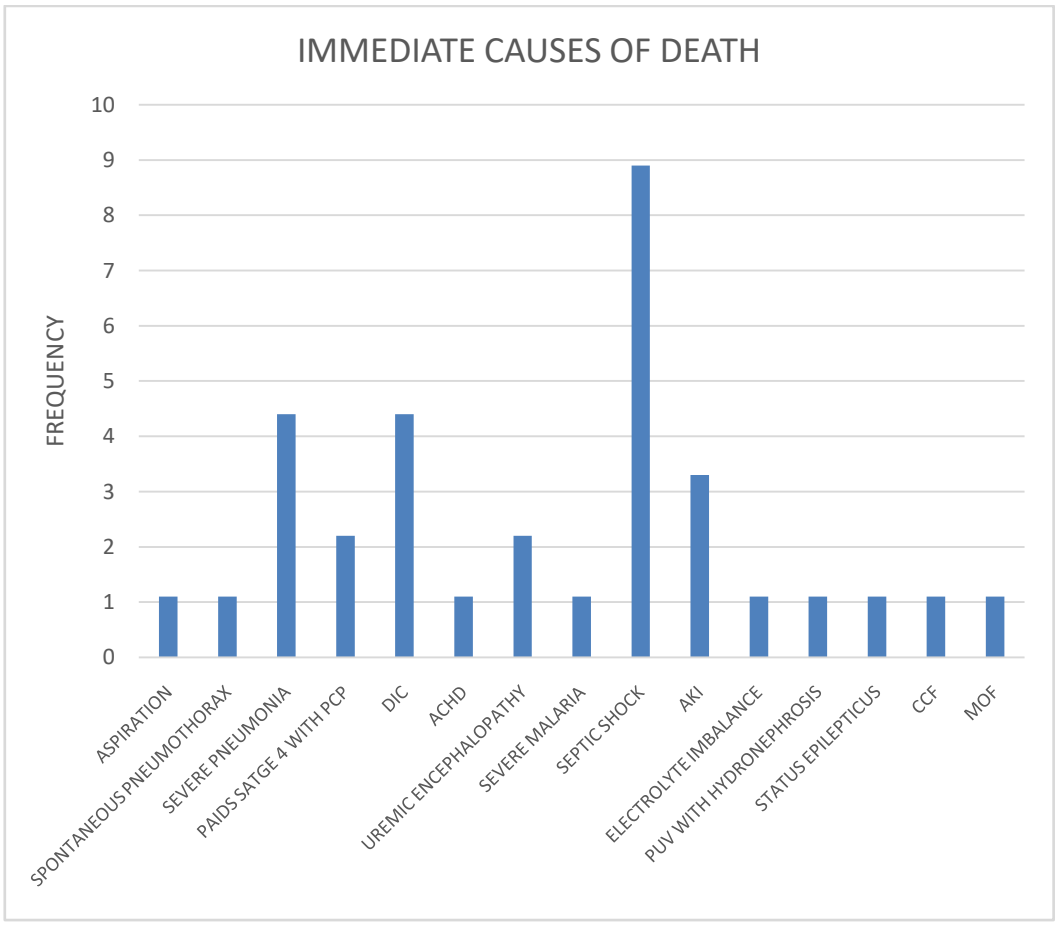


KEY
PAIDS- Pediatric AIDS
PCP- Pneumocystis Carnii Pneumonia
TOF- Tetralogy Of Fallot
SAM- Severe Acute Malnutrition
CMV- Cytomegalovirus
CCF- Congestive Cardiac Failure
HUS- Hemolytic Uremic Syndrome
PUV- Posterior Urethral Valve
MOF- Multiple Organ Failure
CP- Cerebral Palsy
DIC- Disseminated Intravascular Coagulopathy

Figure 3 summarizes the immediate causes of death in APCU. Majority of the immediate causes of death were infectious causes 15(62.5%). Of these infectious causes, septic shock accounted for 9 (60%) of the deaths. Non-infectious causes accounted for 9 (37.5%).

Of those with septic shock, there were more males affected 6(66.7%) compared to females 3(33.3%). Majority of those with septic shock were from within Dar-es-Salaam 6(66.7%)

Figure 3: Immediate causes of death



KEY
PAIDS- Pediatric AIDS
PCP- Pneumocystis Carnii Pneumonia
DIC- Disseminated Intravascular Coagulopathy
ACHD- Acyanotic Congenital Heart Disease
AKI- Acute Kidney Injury
PUV- Posterior Urethral Valve
CCF- Congestive Cardiac Failure
MOF- Multiple Organ Failure

3.2 Structure

From observations and semi structured interviews, it was noted that the APCU had the basic needs to provide services for critically ill children.

APCU; the current situation

Physical setting

The APCU catered for five patient beds and the grounds were clean. There was running water available at all times. It had enough lighting (both natural and artificial lighting) for provision of services. It had two large doors measuring 2040mm by 750mm and four large translucent

windows measuring 2100mm by 1150mm with adequate ventilation. The room where patients were located measured 525 square feet.

All equipment, medications, cupboards, spaces and other objects for use were well labelled. There were signs on the doors and walls restricting access. Bed sheets were taken for laundry and sharp boxes were changed every 24 hours or when need arose. Mosquito nets were changed for every new admission while long term admissions used the same mosquito net till discharge or death.

In case of a power shortage, there was an automated generator that supplied power within 1 minute of power outage. Emergency drugs and equipment were available consistently and they were well labelled and stored in shelves away from reach of children/non-medical staff. There was a functioning refrigerator for storage of emergency and patient medications.

Vehicles for transportation of patients included wheelchairs, a stretcher and baby cots. The choice of vehicle depended on patient's condition and stability. Most patients were transported by wheelchair.

Vector control and hygiene

We found that the APCU did not have a vector control measure in place, apart from mosquito nets, for rodents. These measures include, rodent snap traps, sealing off all entry points such as holes near cabinets, sinks, windows and doors, near leaky pipes. The food storage facilities were inadequate as they led to rodent infestation and bad odor.

Hand sanitizers were only available at the nurses' station. There were 2 washrooms for staff but only one was functional with a flushing system. There were no lavatories for CGs within the APCU. The washrooms were not accessible for handicapped. There were no structures in place for disabled CGs or patients (rails/ramps)

Human resources situation

Looking at the human resources available in APCU, the following are the current demographics of HCPs.

Socio-demographic details

Sixteen out of the seventeen HCPs were females and their ages ranged between 30 to above 50 years.

Eight (47%) of the HCPs are about to retire in the next 5 years.

Table 3 displays the socio-demographic details of HCPs in APCU.

Table 3: HCPs distribution

Number of HCPs	**17**
Specialists	**2**
Residents	**2**
Nurse in charge	**1**
Nursing officers	**3**
Enrolled nurses	**5**
Nursing attendants	**4**

Privacy

For Patients

We observed that there were no private rooms for patient assessment or procedures. There was only one screen available for any such emergencies.

For Caregivers

We did not find the existence of sleeping nor bathing areas for CGs

For Healthcare providers

We did not observe any areas designated for changing rooms, resting areas nor areas for privacy for HCPs

Treatment guideline

Treatment guidelines used in APCU were last updated in 2005. HCPs were available 24 hours for provision of services.

Infrastructure

We compared the international PICU requirements and what existed in the APCU as summarized in Table 4 and Table 5.

We also compared the PICU requirements by MOHCDGEC as of November 2017 and the current APCU setting summarized in Table 6.

Table 4 entails the comparison of structure between international PICU requirements and APCU. To begin with, APCU is not located near any access points. There are no nearby Paediatrician call rooms nor a family waiting area. No laboratory nor emergency tests available for patients. No private room for family counselling or private discussions were observed. There is a staff conference room present but no privacy. No sleeping/bathing areas for CGs nor HCPs. No nourishment station nor a satellite pharmacy in place. At full capacity, the doctor: patient ratio is 1:3. On the other hand, the presence of laundry hampers, functional lavatory, computer station, area for storage of belongings for HCPs, counters and cabinets for medications and a medication station, met the standards.

Table 4: Comparison of APCU with international PICU requirements

INTERNATIONAL PICU REQUIREMENTS	APCU
Located near access points e.g. elevators	Not located near access points
Nearby paediatrician call room	No nearby paediatrician call room
Family waiting/sleep areas or OT/EMD/recovery rooms.	None available
Laundry room present	Laundry hampers present
Laboratory equipment and emergency tests available	None available
Room for family counselling and private discussions	Not present
Staff conference room	Present but no privacy
Functioning lavatories	Only one functioning lavatory for HCPs. None for CGs
Computer station	Present
Area for storage of staff belongings	Present
Sleeping or bathing areas for CGs	None
Counters and cabinets for medications available	Present
Medication station	Present
Nourishment stations and satellite pharmacy	None
Doctor: patient is 1:1	Doctor: patient is 1:3

Table 5describes the bedside comparisons between the international requirements for PICU and the existing setting in APCU. The beds in APCU were different in that, their head beds were adjustable with difficulty for resuscitation purposes. There were no compressed air outlets nor any vacuum outlets. Central heating was absent. No fire safety equipment nor procedures were in place and no curtains for patient privacy. APCU had one power outlet per bed, mobile oxygen tanks for emergencies, four large windows and two doors for ventilator and access purposes. The set temperature ranged from 18^{o}c to 30^{o}C from three air conditioners in the vicinity. Electrical grounding and functional plumbing was available. The treatment guideline in use, last updated in 2005.

Table 5: Comparison of APCU with international bedside PICU requirements

INTERNATIONAL PICU REQUIREMENTS	APCU
225 Sq feet bed space per patient	32 Sq feet bed space with 4.5 feet between patients
Adjustable head bed for emergency resuscitation	Present but adjustable with difficulty
Electrical power outlets >12 per bed	One power outlet per bed
Oxygen outlets >2 per bed	10 mobile oxygen tanks available for emergencies
Compressed air outlets >2 per bed and vacuum outlets>2 per bed (for suction)	No compressed air outlets NOR any vacuum outlets
Central heating- 1	No central heating
Ventilation ducts	Four large windows (210cm by 115cm) and two doors (204cm by 75cm) for ventilation purposes
Air conditioning- depends on capacity of PICU	There are three air conditioners- set temperature between $18^{o}C$ and $30^{o}C$
Fire safety procedures and equipment	No fire safety equipment nor procedures in place
Electrical grounding	There is electrical grounding
Plumbing	Functional plumbing available- one functional lavatory
Illumination for privacy on windows and doors	Translucent windows and curtains for illumination
Curtains for each bed for patient privacy	No curtains for patient privacy
Current treatment guidelines of facility PICU	Treatment guideline used was last updated in 2005

Table 6 describes the comparison between the PICU requirements by MOHCDGEC and current APCU situation. APCU contains five beds with a corridor outside that measured 1524mm. There are only two water access points for a constant water supply, not safe for consumption. There are no elbow operated taps nor a storage facility for pharmaceuticals, food, equipment or supplies. No toilets or bathrooms for CGs. No support railing for disabled CGs nor patients. The following was noted to be absent in comparison; staff changing rooms, waiting area, consultation rooms, sluice room, clean/dirty utility. None of the staff has been trained in paediatric critical care and there is no specialist anaesthesiologist responsible for critical care.

A few structures met the standards such as, presence of lightning protection, large doors for ease of access, one functional toilet, one electronic patient monitor, at least one staff trained in ETAT. The nurses have three shifts as per protocol, though the nurse: patient ratio was 1:2 during day shift and 1:3 during night shift. Also fewer qualified nurses were available.

Table 6: Comparison of APCU with PICU requirements by MOHCDGEC

PICU REQUIREMENTS- MOHCDGEC	APCU
Six beds	Five beds
Corridor width 2100mm	Corridor outside APCU 1524mm
All buildings must had lightning protection	Present
Water supply needs to be adequate, clean and safe for consumption and other purposes	Water supply present but not safe for consumption
All service rooms must have water points in relation to patient numbers	Only two water points present with five patient capacity
Elbow operated taps	None
Adequate and secure storage facility for pharmaceutical, food, equipment and supplies	None
Toilets and bathrooms should be adequate according to number of patients. With special consideration for disabled patients	None for patients
Support rails for disabled patients	None
Doors- 1200mm width and 2030mm height	Doors- 750mm width and 2040mm height
Two staff changing rooms	None
Two staff toilets	One functional
Waiting area -1	None
Consultation room- 1	None
Nurse's station	Present
Sluice room- 1	None
Clean utility -1	None
Dirty utility- 1	None
On-duty doctor's office/room	None
Ventilators and electronic patient monitors	One electronic patient monitor
Specialist Anaesthesiologist- at least 1, responsible for critical care	None. Two paediatric specialists responsible for critical care
At least one trained staff in Paediatric critical care	None
At least one trained staff in ETAT	Present
Three shifts for nurses per day	Present
Nurse to patient ratio 1:1	Nurse to patient ratio 1:2 day shift and 1:3 night shift
Nurse requirements:	Nurses available overall:
Nursing officer 3	Nursing officer 3
Assistant nursing officer 15	Assistant nursing officer 5
Medical attendant 7	Medical attendant 4
2 hourly, 4 hourly and 12 hourly vital signs	4 hourly vital signs

Physical structure

Information from the KIIs and semi structured interviews confirmed what we observed
For instance, with regard to the shortage of equipment, tools and medicines, one CG stated,

"....honestly they are doing their best, just there is a little shortage of working tools/equipment and medicines.." (CG-1)

The response from Health care providers was in line with what we observed.

"...MNH does not provide a conducive environment for provision of QOC as there is lack of basic infrastructures to provide minimally acceptable QOC. There is a noted lack of working tools/facilities, inadequate human resources that leads to early burnout. The process needs to be improved..." (KI-1)

In efforts to address the discrepancies noted from the comparisons with the international as well as local standards, the HCPs interviewed in this study, reported existence of efforts to redress the situation.

"...What needs to change in terms of structure at APCU is; adequate oxygen delivery equipment, ventilator machines, modern technical machines for monitoring such critical patients, more trained personnel. Also, the attitude of the HCPs needs to change and they need to be more considerate and committed to their profession..." (KI-1)

Unsupportive environment

Feedback from the CGs supported the observations that were made. Amongst these, majority 68 (75%) pointed out that the absence of lavatories within APCU was the greatest hurdle.

The CGs had to leave their children's bedside and use the lavatories outside the APCU, which was a distance away. This created a sense of anxiety and inconvenienced them as well as the HCPs.

"...I urge the APCU to create a self contained toilet and bathroom services, as we need to walk a long distance and a great deal of time is spent away from our sick children as we need to go outside the APCU to be able to get access to toilets.." (CG)

Other hurdles were pointed out by a few CGs that also contributed to the unfavourable environment in APCU. Factors such as the room temperature, luggage handling during admission process, and availability of warm running water were amongst the few that were mentioned. The set temperature in APCU ranged from a minimum of 18^{o}C to 30^{o}C. This depended on the weather conditions and temperature within APCU. The standard international requirement being at 24^{o}C.

"... The room was too cold and unfavourable for the baby to stay. But they didn't listen to us"(CG)

"...I prefer to bathe/wash my child with warm water every morning but it is not available here. I urge there should be a hot water supply for such purposes." (CG)

Human resources

Availability of adequate and qualified human resources in critical care was a challenge faced in our setting in APCU.

By simple observation, we noted that the number of HCPs to patient ratio at full capacity, was diminished. This observation was confirmed by both CGs and HCPs.

*"...they need to increase the number of health working staff, human resource is not adequate" (*CG)

The HCPs also complained of this shortage as it was leading to burnout.

"..... There is a noted lack of working tools/facilities, inadequate human resources that leads to early burnout.." (KI)

The norm for APCU in terms of availability of HCPs is as follows;

The specialists and residents on call are available 24 hours. The ratio of nurses to patients ranges depending on the availability of the nursing staff. On average, during a day shift, the nurse to patient ratio is 1:2 and during the night shift, the ratio is 1:3.The doctor to patient ratio is 1:3 at full capacity.

During the morning hours, a major round is done, and each patient is assessed and managed accordingly. Thereafter, the resident on call/paediatrician is called in case of emergencies or new admissions.

Table 7 looks at HCPs to patient ratio in APCU. At full capacity, the HCPs to patient ratio was 1:3.

Table 7: HCPs to patient ratio

HCPs to patient ratio at full capacity	
Nurse to patient ratio	1:2 day shift
	1:3 night shift
Doctor to patient ratio	1:3

3.3 Process

This section shall entail a summary of the admission process- its strengths and setbacks, referral system, documentation process as well as HCPs training.

From the semi-structured interviews conducted with the CGs and HCPs, as well as from observation, the admission course was similar for all patients who were received in APCU and has been recapitulated in Figure 4 below.

Informing HCPs in APCU prior to admission of a critically ill child, helped them prepare the emergency equipment, medications, tools and the bed space that would be required by the patient.

Upon arrival, the patient was attended immediately or within a few minutes of arrival. Depending on the patient condition, initial emergency managements were initiated.

Figure 4: Admission Process

Prior to admission HCPs informed about incoming patient

↓

Patient received by Nurse /Doctor/Both at APCU from EMD/Transfer in

↓

Caregiver greeted and allocated a bed space

↓

- ✓ Quick assessment and management of emergency signs/situations
- ✓ Vital signs taken concurrently
- ✓ Another nurse takes vital information and review of medication history as well as registration of patient

↓

After stabilization, history from CG and thorough physical examination of patient

↓

Provisional diagnosis is communicated to CG

↓

Investigations are done (after informing CG) and feedback of results given

↓

Management initiated

↓

Continuous observation and monitoring

↓

CG oriented about ward protocols and feeding schedule

Admission process:

Although the admission process was eminently lengthy and arduous, it was also noted to be thorough and consistent for all the children that were admitted in APCU. This was established based on the semi structured interviews and observations made. The CGs and HCPs were in accord concerning the credibility of services provided during the admission process.

As soon as the children arrived in APCU, they received immediate medical attention. Most of the times they were received by nurses 43(48%). The provisional and definitive diagnosis were made and communicated to the CGs. Most of the CGs confirmed that prior to investigations, they were explained the reasons and feedback of the results were given to a great extent. All the children were given medications on time.

Most importantly, the communication between CG and HCPs was clear and understood and most 62(69%) of the CGs were very pleased with the communication.

CGs were given adequate time for consultation during rounds and they noted that the HCPs were attentive to their children's needs. The staff was friendly and empathetic to patient's condition. Good teamwork was eminent between the HCPs.

Patient files were stored safely to ensure privacy and confidentiality and this was also observed by the researcher and the assistants.

The time to response for emergencies was immediate and the doctor was always informed. Vitals were taken on time and abnormal vitals were communicated to the CG and the doctor.

Many 56(62.2%) of the CGs were "Very satisfied" and "Satisfied" with the services provided to their children while they were admitted in APCU

"…they have given good service to my child.. they took measurements and gave her medicines and cleaned her well… if there was a problem, I would call the nurses and they would come and solve it.." (CG)

"…regarding services, it was actually good. It is very different from where I was in Mafia. At MNH there are better services and better tools.."(CG)

"…I am so proud of services at MNH, I didn't imagine that during the night the nurses and doctors will be available.. I think the services are good and satisfactory.."(CG)

Setbacks during the admission process

On the contrary, there were several setbacks that were pointed out by both CGs and HCPs. Patients were transported for investigations and depending on their condition and stability, the mode of transport would be variable. But it was noted that most patients were not transported outside APCU for investigations.

Of those that were transported, many CG complained that the destination for investigations was too far from APCU.

Only about half of the CGs were explained what the medications were for. Unfortunately, majority 81(90%) of the CGs were not explained about the possible side effects of the medications given.

Of those CGs whose children experienced a state of emergency while admitted in APCU, majority 13(52%) of the CGs were not explained/updated about patient condition.

There were an equal number of CG who received sufficient, insufficient and no information about instructions, progress and prognosis at the time of discharge

In the unfortunate case when there was a death in APCU, majority 8(80%) of the CGs complained that insufficient information was delivered about patient condition.

Of the CGs who lost their children in APCU, the cause of death was not communicated.

"…I was not informed about my child's prognosis.. I knew my child had a kidney problem, and was given hope that a person can survive with one kidney, so I had hope that my child will be operated and would recover.." (CG)

Once the children and CGs were discharged from APCU, majority64(71%) of the CGs were not educated about patient condition and preventive measures.

Delayed referral process

From the interviews and questionnaires, the HCPs noted some shortfalls in terms of the admission process.

The delay in the referral system proved to be a frustration to both the CGs and HCPs as confirmed during interviews and KIIs respectively.

"….In terms of process, the standards of health care services are not met. The biggest challenge we face is the delay in referral system or transferring process of patients from other wards. Due to this delay, the interventions put in place to save a child's life tend to fail as it is too late. Thus there needs to be a better referral/transferring system in place so as to enable early interventions and possible change in outcome…"(KI)

"..services are still very poor, the quality of service is not adequate at all. My child was referred from Zanzibar indicating that the hospitals there could not manage his condition…. I am recommending to give consideration to "referral cases" as priority, then only will the services improve"(CG)

"…if you can visit Amana hospital, they have very poor services and bad customer care… when I went there, I was told to go back home and return the following day. Because of that, my child's treatment was delayed. I could have probably received better services for my child had I been referred earlier"(CG)

Documentation process

During analysis of the patient files and documents, all the necessary details were documented for patient review. A systematic flow of patient review was noted and was consistent. Patients were seen by specialists and residents/interns.

Stepwise documentation of procedures done during resuscitation were well reported with findings. Death certification was also well documented though the immediate and underlying causes of death were not indicated post resuscitation. The causes of death were noted after consultation with the specialist or after a mortality meeting/review. Lack of feedback during death was reflected by the CGs during the semi structured interviews.

Table 8 summarizes the HCPS training in APCU. Out of 17 HCPs, only 4 (23.5%) were recently trained in PBLS. One (5.9%) was trained for critical care two years ago.

Table 8: HCPs and training

Total number of HCPS in APCU	17
Those who were recently trained for critical care (past 2 years)	1
Recently trained for PBLS	4
Specialist	1
Nurses	1
Residents	2

The APCU staff had last upgraded in Paediatric Basic Life Support in September 2016 (by Karolinska Institute). Ones in attendance were the nurse in charge of APCU and the attending specialist only, together with two residents that were rotating in APCU at the time.

None of the HCPs at APCU have been formally trained in paediatric critical care. Short courses were attended by one specialist and nurse (2017 and 2004 respectively).

3.4 Feedback Process

As part of the QOC, the process entails a major factor of feedback to the CGs. This plays a vital role in terms of knowing the progress of the patient and also contributes to the level of satisfaction for the services provided.

CGs complained about the lack of feedback concerning patient condition especially during emergencies or if the patient died. There was no communication about the cause of death and this caused a lot of distress to the CGs and their families. This was especially noted during the semi structured interviews.

"... I have never been given official information about what my child was suffering from, rather just rumours from my neighbours based on what they see and speculate... I was never told what the medications were for, I just saw them giving my child some medicines" (a CG who lost his/her child to death)

It was also noted that upon discharge, the CGs and their children were not educated about patient condition and preventive measures.

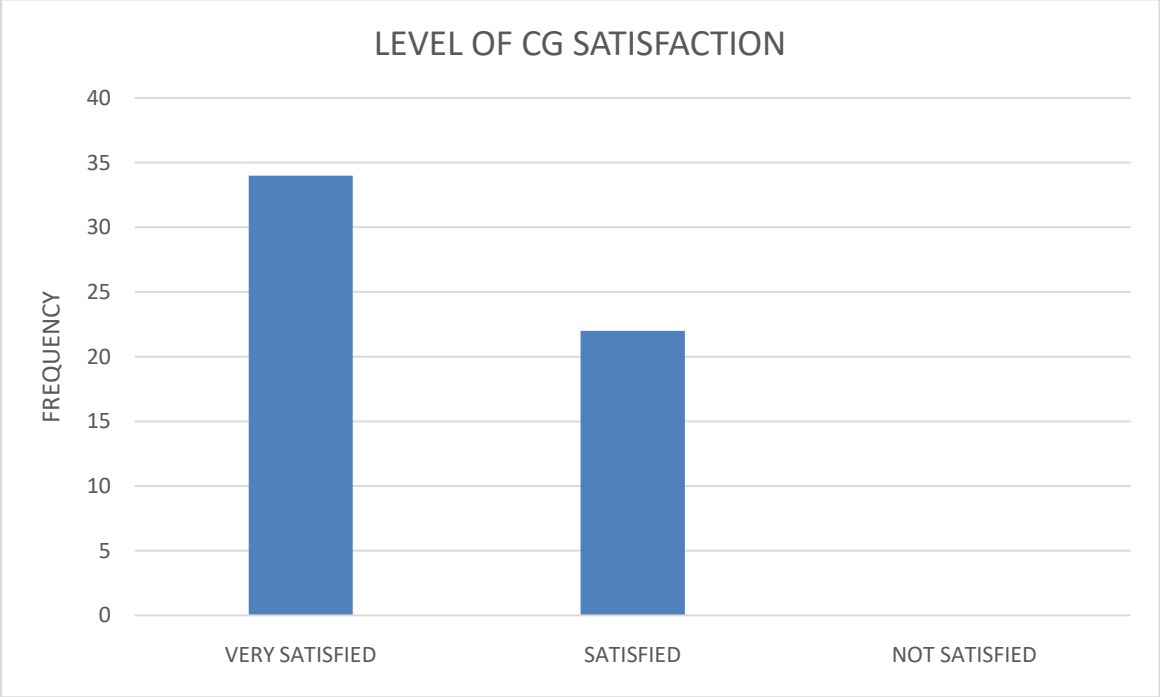
On the contrary, from the semi structured interviews, majority12 (71%) of the HCPs noted that sufficient instructions concerning progress and prognosis were given during discharge by both nurses and doctors. Also, sufficient CG education was given about patient condition and preventive measures prior to discharge.

This vast disparity in views comes despite adequate and good communication between CGs and HCPs.

3.5 Level of caregiver satisfaction

Figure 5 displays the level of CG satisfaction. This was from the CGs that consented for the questionnaires. All of them reported to be satisfied with the quality of services provided to their children. They only differed in the level satisfaction. While 34 (37.8%) reported the services to be very satisfied, 22 (24.4%) reported them to be satisfied and none reported to be not satisfied. Some of the CGs did not comment on this and accounted for 34 (37.8%).

Figure 5: Level of caregiver satisfaction



Of those that reported to be very satisfied with the services rendered, 31 (91.2%) were CGs whose children survived to discharge while 3 (8.8%) were CGs whose children had died.

Of those that reported to be satisfied with the services rendered, majority 14 (63.6%) were CGs whose children survived to discharge while 8 (36.4%) were CGs whose children had died.

Majority 56(62.2%) of the CGs that reported to be “Very satisfied” and “Satisfied” to the services rendered, were from Dar-es-Salaam. The rest were from upcountry.

Although a majority of the CGs expressed great satisfaction to the services rendered to their children in APCU, none of the CGs reported to be dissatisfied.

CHAPTER FOUR

4.0 DISCUSSION

Quality of care plays a pivotal role in the management of critically ill patients. Amongst other factors noted to affect the QOC in our study included, the infrastructure, outdated treatment guidelines, increment of trained staff in critical care, inpatient care and the feedback process, especially during emergencies and deaths. These have contributed to a certain extent.

The main objective was to assess the QOC provided to children admitted in APCU at MNH. Since this is multifactorial as described by the Donabedian model, it shall be divided into five major categories; outcome, structure, process, feedback and recommendations. Furthermore, each category shall discuss in depth on its overall contribution to QOC provided.

To understand the impact of QOC in APCU, we begin by looking at the outcomes. As noted in the results, majority of the children admitted survived to discharge. Of those who died, majority died during the night shift 14(58.3%), within the first 24 hours of admission 10(41.7%) and were mostly a "Transfer in"20(83.3%) from other wards in the paediatric department. This could possibly reflect a delay in the referral systems or health seeking behaviour or a delay in decision making by HCPs.

A study was done by Kwizera et al in 2012 looking at National intensive care unit bed capacity and ICU patient characteristics in a low income country(38). The mortality rates in African countries ranged from 36% to 40%. In comparison to our study, the mortality rates in our setting are much lower from the projected picture, thus a step in the right direction. Although comparison with such studies is challenging. Speculated reasons could be that the APCU is a unit that provides centralised medical care. It is not a shared or mixed facility with other sub specialities such as surgical or neonatal ICU. The age limitation in APCU restricts the admission of neonates that require specialised 'high care' observation and treatment thus reducing the mortality rate all together. In addition, in comparison to the above-mentioned study, the APCU admits an average of 30 patients per month. This is number is much lower compared to the admissions in other PICUs in other developing countries.

Disease patterns, geographical location, health-seeking behaviour, access to medical care and differences in management protocols vary, amongst other possible reasons.

The median duration of stay was five days. Most patients51 (56.7%) stayed in the APCU for more than 72 hours.

The most common underlying 17(70.8%) and immediate 15(62.5%) causes of death were infectious causes and septicaemia was a common denominator. Most of the patients came from within Dar-es-Salaam. This could indicate that the management of septicaemia, a commonly encountered condition, needs to improve especially in peripheral hospitals so that it can be managed effectively at earlier stages.

A glance at the impact of structure on QOC in APCU; the strengths of the structural analysis revealed that the APCU infrastructure existed with a management plan. However, additional improvements need to be made in terms of infrastructure, manpower, updated treatment guidelines, and trained personnel in critical care and emergency functional equipment amongst others.

To begin with, in our study, a female predominance 16(94.1%) was noted amongst the HCPs in APCU and is a matter that requires further investigation. Women being more prone to select this field of medicine has been evident all over the world, including in our setting. The reason for this requires further exploration.

When comparing the staffing requirements in PICU by MOHCDGEC, November 2017 (34) there is a vast shortage. The requirements include; at least three Paediatricians, one specialist Anaesthesiologist, three nursing officers, 15 assistant nursing officers and 7 medical attendants. This was far from ideal in our setting as noted above. It has led to shortage in staffing, burnout rates and ultimately affecting the quality of services provided.

At full capacity, the HCPs to patient ratio was 1:3 and this had an impact on the quality of services provided due to the work overload. None of the HCPs were formally trained in paediatric critical care which contributed to a certain extent. Lack of a dedicated paediatric intensivist may contribute to the mortality rate.

Within the workforce in APCU, a generational gap was observed. Majority of the HCPs were near a retiring age and a difference in thought process was noted.

A study that was conducted by Spector et al in 2014 was based on Gender and Generational influences on the paediatric workforce and practice(39). It revealed a generational difference among the paediatric workforce, influenced the approach to care. Four different generations make up the workforce and each holds different values. Some of these values may be in conflict. (39)

Another article review revealed an increasing proportion of paediatricians who work part time, mostly women, and others who plan to retire at a younger age than previously. The number of children is on the rise thus creating a possibility for a critical need for additional paediatricians or other care providers to serve the paediatric population. (39)

The above articles are in concurrence with the findings in our study that majority of the HCPs were between the ages of 30 to 50years. Most of them were expected to retire in the next 5 years. This shall create a huge gap in the provision of services to the paediatric population. Thus, it is recommended that the hospital administration recruit younger staff to avoid this massive gap that is predicted.

In terms of training in paediatric basic life support, it was observed that only four (23.5%) out of the seventeen HCPs were trained in PBLS (last upgraded in 2016), amongst whom, 2 were permanent staff and 2 were rotating residents.

A study was done by Mostafa et al in 2017 on Impact of basic life-support training on the attitudes of health-care workers toward cardiopulmonary resuscitation and defibrillation(40). It revealed that repeated educational programs were needed to improve the retention of knowledge and skill for Basic Life Support (BLS) A positive attitude towards BLS was predicted by; recent completion of training, number of previous BLS training courses and previous exposure to cardiac arrest cases.(40)

Since all of the resuscitations are done by HCPs, it is mandatory that all HCPs are updated regularly on the current triage and resuscitation techniques so as to improve the quality of the resuscitations and eventually the outcome of these patients.

Working in an environment as sensitive as the APCU, the HCPs need to be motivated and encouraged to maintain and improve on the quality of services they provide.

In order to achieve this motivation, a study conducted by Manongi et al, 2006, mentioned some tactics that need to be implemented so as to achieve a better outcome for our patients as well as for the job satisfaction of the HCPs(41)

It revealed that motivation was influenced by both financial and non-financial encouragement and motivating factors included appreciation by managers, colleagues and the community, a stable job and income as well as training(41). The main discouragers for HCPs included low salaries and difficult working conditions.

The working environment was one of the observed factors that brought discouragement. This was echoed in the feedback from the CGs. The environment in APCU was unfavourable to both the CGs and their children and this led to discomfort during their stay. The HCPs are doing what they can with what is available to provide the best services in the current situation/environment.

As noted above, burnout rates were pointed out to be high in APCU. We discovered that the shortage of human resources was at all levels of care in APCU and has contributed to exhaustion and increased workload for the HCPs. This has led to increased level of stress, lack of motivation as well as lack of job satisfaction.

A recent study was conducted on job stress and burnout syndrome among critical care healthcare workers, by Noha et al, in 2017(42). It revealed that a majority of the participants reported a variation in of workload, quantitative overload, responsibility for patient’s lives and lack of perceived control but were generally satisfied with their jobs.

High levels of emotional exhaustion, high levels of depersonalization as well as low levels of personal accomplishment were amongst the domains of burnout syndrome.

The study advised reducing intra-group conflict, improving skills utilization, and raising job satisfaction as crucial to reduce burnout among the HCPs. More attention and psychological support is recommended to critical care Healthcare workers.(42)

Since these findings were a direct feedback from the KIIs, it was a cry for help. The hospital administration needs to pay special attention to the HCPs in APCU, as they are most vulnerable and most affected by this shortage.

Looking at HCP motivation, a study was conducted by Lambrou et al in 2010 on Motivation and job satisfaction among medical and nursing staff(43).The survey revealed that achievements were ranked as first among the four main motivators, followed by remuneration, co-workers and job attributes.

From our findings, it is advisable that the administration look for ways motivate their HCPs. It has been noted from KIIs that the burnout rates amongst HCPs in APCU is high, thus apart from increasing qualified staff, motivation of existing staff is much needed. This can be in ways of increment in salaries, employee of the month bonuses or promotions in ranks to encourage them.

A component that requires immediate attention is the treatment guideline. The current guidelines, although stand the test of time, is constantly challenged by the updated managements and advancement in medicine. These guidelines keep changing and updated versions are required for the inexperienced as well as for adding knowledge to the existing team of HCPs. Examples of new guidelines are the nutritional guidelines. The recent ASPEN (American Society of Parenteral and Enteral Nutrition) Nutritional Guidelines weighs the benefits of early versus late parenteral nutrition in these children(44)

Currently, the critically ill children are fed porridge that comes from home (made by the CGs/ neighbours/family members) or any food that comes from outside the hospital. This applies to the CGs too. It is due to the lack of a nourishment station. This in turn affects the management

of patients with morbidities that may require a specialized diet such as those with kidney diseases or with metabolic disorders. Special tailored diets are needed for patients with various medical conditions in APCU. Thus, involvement of nutritionist as well as adaptation of the ASPEN guidelines can prove to be beneficial.

In terms of infrastructure, several areas were lacking as noted above, some of which contributed to affecting the QOC. These included; lack of nearby paediatrician call rooms, which caused half of the resuscitations to be done by nurses alone thus affecting the overall outcome. Out of the 24 patients who died, 22 were resuscitated and 2 patients died on admission. Amongst those that were resuscitated, 11 (45.8%) were resuscitated by doctors and 11 (45.8%) by nurses. Thus, during resuscitation, almost half of the times, the doctors were not around as most deaths occurred during the night shift. It is thus strongly recommended to have a nearby paediatrician call room, so that they are in close proximity with APCU for such emergency situations.

Another observation was the lack of laboratories for emergency tests, that could alter the management, and hence the outcome of the patients.

Head beds in APCU adjust with great difficulty especially during resuscitation thus affecting the quality of CPR. Lack of vacuum outlets necessitated the use of manual suction machines, which were dependent on electricity or manually pumped. This affected the response time, as the machine would function with difficulty. Some of the equipment used for emergency resuscitation was not functional, thus affected the quality of CPR and patient outcome.

Another component that has been evaluated in this research is the process. This entailed initial evaluation, emergency situation, in-patient care as well as staff knowledge and practices. These were evaluated via semi structured questionnaires and observations.

In our study, it was observed that the patients admitted in APCU were not only evaluated immediately upon arrival but were assessed daily by the entire team of HCPs. This contributed to better outcomes and a short duration of stay in the APCU.

Based on a study done by William et al in 2014, it looked at Structure, process and annual intensive care unit mortality across 69 centres in USA(45). The process of care involved disease driven interventions and early goal-directed therapy. These interventions reduced the discrepancy in practice and helped to improve outcomes across ICUs. Similarly, another single centre study revealed that the use of a daily care checklist was associated with 50% reduction in duration of hospital stay.

It is advisable that a daily checklist for evaluation of every patient admitted in APCU, be designed and administered as part of care to ensure a wholesome approach. This would improve the outcomes and have a better follow up for patients.

In an emergency situation, the response time was immediate. This was observed and echoed in the semi structured interviews by both CGs and HCPs. Unfortunately, CGs complained that no feedback about the patient's condition nor updates about what was being done during the emergency, were given.

This was a setback as it led to high levels of anxiety and in the case that a death occurred, some CGs complained that they were not explained the cause of death of their patient. Thus, it created a lot of confusion and uncertainty amongst the family members.

In the case of a death, the appropriate steps for CPR were well documented in the files though the immediate and underlying causes were not documented in majority of the files at that time. Although the response time to emergencies was immediate, the outcomes to CPR done, was death. This has led to question the quality of CPR delivered to these patients.

A study done by Moga et al in 2016, looking at Continuous Quality Review (CQR) of ICU CPR events, reviewed three performance domains (technical, team and systems) and how they affected CQR(46). The study revealed that quality CPR occurred 74% of the time but was not associated with event survival. Excess noise, leadership confusion and equipment failure were the common causes of poor quality CPR. Communication, system and technical errors also contributed to poor quality CPR.

The above-mentioned study was in keeping with our observations as a lot of the equipment and drugs required for CPR were consistently available but were not serviced nor checked regularly for functionality. This way, during an emergency, some equipment did not function, and it contributed to poor quality of CPR.

During resuscitation, leadership is crucial. Having a leader that knows the current guidelines and how to deliver quality CPR can change the patient outcome. And this was lacking in our study as only four HCPs were trained and during some emergency situations they were not available. This may have affected the quality of resuscitation that was done on these children in cases of emergencies, thus having an impact on the outcome.

Based on a study done by Tibballis et al in 2009, they observed that the introduction of a paediatric medical emergency team led to a reduction in the total hospital deaths as well as preventable cardiac arrests in the wards(47)

The regular training and evaluation of HCPs on quality CPR, introduction of a trained paediatric emergency medical team as well as consistent checking of the emergency crash carts are necessary for a step in the right direction and better outcomes. Although the outcomes of CPR did not reflect the urgency of response time by HCPs, with regular training, this may improve.

From the above findings, inpatient care was noted to be consistent and thorough with minor setbacks that require attention, for better QOC provision. The staffs were fluent and conversant of matters of daily in-patient care and emergency situations although required refresher training courses in PBLS and PALS.

As part of the process, delays in the referral system were noted by CGs to be a major setback in the QOC. Based on a study done by Samuelson et al in 2013(48); Do health systems delay the treatment of poor children?, it explored the delays in receiving adequate healthcare when mothers with a sick child attend a health care facility. Four main obstacles were identified. These included; confusions over payment, inadequate referral systems, the inefficient organization of health services and the culture of communication.(48)

A similar complaint was echoed by both CGs and HCPs in our facility since 10 (41.7%) of all the deaths occurred within 24 hours of admission in APCU. This was a reflection on the delay in referral of these patients. The delay may have been from the peripheral hospitals or delay of CGs seeking medical attention. This can be related to the domicile as a proxy of the level of education of those CGs. Majority of the patients were from within Dar-es-Salaam, mostly Mbagala and Kigamboni, where a majority are suspected to have primary level of education.

The delay in referrals is one of the major contributing factors as most CGs noted that their child could have been saved had they been referred earlier to our facility. They also reported that the peripheral hospitals lacked the essential equipment and medications that are required for management of childhood illnesses.

It was also noted by HCPs, that majority of CGs delayed in seeking medical attention for their children. By the time the patient is received at MNH, the child's condition has deteriorated, and they end up dying within the first 24 hours or worse, they die on admission at the EMD.

On the other hand, MNH being a tertiary hospital receives referrals from different parts of the country. Some meet the criteria to be referred while others are referred due to biased reasons such as "lack of intravenous fluids" "lack of gloves" "no oxygen" "no medicines" and the like.

This creates a great burden on the tertiary care hospital and creates overcrowding of patients, thus inevitably affects the QOC provided to these patients. The workload increases, job stress increases, job satisfaction decreases, there is a lack of motivation to work and thus more burnout rates amongst HCPs.

Training of doctors in peripheral hospitals for management of common childhood illnesses needs to be on going and updated. This would reduce the burden on tertiary hospitals in general. A referral protocol needs to be created so that referrals due to biased reasons are dealt with at the highest level and people are held accountable.

A great team work was observed amongst the HCPs. Thus, when it comes to teamwork, age of healthcare providers in a critical care setting can be a double-sided coin. On one hand their knowledge and experience in the field is vast and of benefit in this setting. On the other hand, the emergency response time is slower in older HCPs compared to the youth.

This can be used in a win-win situation whereby senior HCPs can be team leaders in case of an emergency to give directions based on their knowledge and experience and the youth can use their swift response time to handle the emergencies under guidance from the seniors.

As one of the major components contributing to QOC, the feedback process is vital. It complements the overall patient/CG satisfaction and overall quality of healthcare services. It helps to correct or identify actions that are needed, and it motivates behaviour.

In our study, we observed that CGs were not given sufficient feedback concerning their patient's condition especially during an emergency situation or in the cases when death occurred.

Majority of the CGs were given feedback about the investigations done to their patients but almost none of them were given feedback about the possible side effects of the drugs that were being administered.

Based on the semi structured interviews, despite there being a good communication between the CGs and HCPs, the lack of feedback has created a sense of confusion and uneasiness amongst the CGs especially to those who lost their children to death.

Feedback does not only entail from HCP to CG. But rather it works vice versa too as noted in a review by Goyal et al in 2015(49); Why patient feedback is important for Health Care Providers?. He observed that patient feedback consists of the views and opinions of patients/CGs on the quality of care they experienced. This can be in the form of surveys, audit, comments or complaints. These surveys help in identifying the patterns and trends of common experiences and show if a negative experience is occurring more or less frequently over time.

This way, by using the surveys, patients can express their opinions on the services provided and, in the process, help the administration identify the strengths and setbacks in the quality of services.

Thus, good patient experience and good clinical quality complement one another in this way.

Another study done by Maria et al(50), Does feedback influence patient - professional communication? Empirical evidence from Italy, 2014, revealed that a minor increase in awareness amongst HCPs on patient's opinions from surveys brought about a consistent feedback on patient satisfaction.

Death of a child or a loved one can bring immense sadness in a CGs life. Thus, communication and feedback can help ease the bereavement process for the families.

Based on a medical protection casebook of USA- 2013(51), it was noted that 39% of the complaints received in the hospital in relation to bereavement is due to poor communication between CG and HCP. Because no one communicated well with the grieving family, it created a lot of pressure and confusion. If there was a better communication, between the HCP and the families, grief would be better handled, and the family would feel involved. (51)

Open communication, honesty, professionalism together with empathy need to be considered in the case when breaking the bad news. From the beginning, it is vital to communicate on the daily progress and prognosis of their patient to prepare them for what is expected. Families should be left to grieve and let them air out their concerns without interruption or judgement(51).

In our study, no feedback was given about the cause of death or the condition of the patient. This created inappropriate conclusions based on rumours about the possible cause. This also created tension between families and HCPs.

In conclusion, the HCPs need to be trained further on imparting bad news, and ways of dealing with families who have lost their child to death.

Lastly, one of the outcomes we looked at during our study was concerning CG satisfaction. This was in relation to the services rendered to their children while admitted in APCU. Based on the semi structured interviews, all the consenting CGs noted to be satisfied with the services. The level/degree of satisfaction varied whereby many34(37.8%) and 22(24.4%) of the CGs noted to be VERY SATISFIED and SATISFIED with the services provided respectively.

A study done by Agarwal et al on Parental Satisfaction in the PICU, 2018, revealed that, through the use of a PICU survey tool, that parents expressed a high level of satisfaction in terms of communication with the HCPs in PICU.(52)

Thus, the use of a survey or an opinion box for the CGs, would be helpful in identifying the strengths and weaknesses of the services provided.

4.1 Strength and Study Limitations

During the data collection, two research assistants were recruited to assist the researcher during interviews and observation of structure and process, for triangulation, to minimize bias. These assistants alternated days and observed at random times of the day to avoid the Hawthorne effect (47) and observer bias. The level of CG satisfaction was evaluated via a semi structured interview that was performed outside APCU and after death or discharge of the patient. This was done to allow fading of social desirability and to allow an open and honest communication between researcher and CG. The tools that were used during data collection were modified and tested at outpatient clinics prior. The administrative personnel were not included in this study and could have served as a proxy of the challenges encountered by the HCPs in APCU. Upon admission into APCU, the frequency of specialist review within the initial 24 hours was overlooked and thus would have been a proxy of the care that the child received.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

In terms of the outcomes;

Based on the results stated above, despite majority of the children surviving to discharge, a significant number of children died within APCU. Of those who died, most died during the night shift and were a “Transfer in” from other wards. On one hand this reflects the delay in decision making process. On the other hand, it revealed the impact of shortage of staff especially during the night shift. Most children stayed for a short duration of time within APCU indicating the forte of services provided.

In terms of structure;

Although APCU had the basic structure for provision of services to the critically ill children, it lacked in several major areas especially when compared to the local and international requirements. The treatment guidelines need to be updated promptly. Trained personnel in critical care are required for a cumulative management of these children.

In terms of process;

The admission process was noted to be thorough for every patient with an immediate response time during emergencies and admissions. This contributed to better outcomes. Staff knowledge and practices need to be refreshed especially in terms of PBLS and PALS as it affected the quality of CPR. Feedback practices need to be emphasized especially in cases of death and emergency situations.

Level of caregiver satisfaction;

The level of caregiver satisfaction reflected the quality of services rendered, whereby none of the caregivers noted to be dissatisfied.

5.2 Recommendations

The following are the recommendations that are suggested based on what we observed and identified in our study.

1. There is a need of a current treatment guideline for APCU
2. To undertake measures of achieving a 1:1 ratio of staff to patient especially during the night shift.
3. To obtain better, functional and user-friendly modern equipment for the APCU, which should have regular medical engineer maintenance. Each bed must have a set of basic emergency equipment.
4. Since APCU is part of MNH, a tertiary referral hospital, it is recommended that its infrastructure needs to be upgraded to meet the international standard requirements of a PICU.
5. Continuous Medical Education of all the staff concerned. All staff in the healthcare to have a mandatory minimal training in PBLS and PALS.
6. Due high burnout rates stated in KIIs, ways of encouraging HCPs and keeping them motivated is much needed.
7. Training of HCPs for bereavement counselling during death situations.
8. Using a daily checklist for patient review, better follow up and feedback.
9. Patient survey tools for feedback to improve on patient centred care. This would also ensure accountability of actions and feedback from HCPs.

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APPENDICES

Appendix I: Consent Form – English Version

Study Title: Quality of healthcare among children admitted in Acute Paediatric Care Unit at Muhimbili National Hospital

Part A:

Introduction

My name is Dr. Remtullah, Zulfikar Aleya, MMED student at MUHAS, department of Paediatrics and Child Health. I am conducting a study on quality of healthcare among children admitted in APCU and MNH. Quality of care is pivotal to the outcome of children admitted, especially in the critical care unit. It contributes to the outcomes which may include survival to discharge or death. Several studies have been conducted on the QOC among children but very little is known about the QOC to children admitted in the critical care unit. Here, the most fragile children are admitted with life threatening illnesses that require close monitoring and extra care.

You are invited to participate in this study, which will look at quality of healthcare provided to children admitted in APCU at MNH. Kindly read this form and understand it well before agreeing to the study. Any queries you may have shall be answered

Purpose of the study

The purpose of this study is to assess the quality of healthcare in children admitted in APCU at MNH, Dar es salaam, Tanzania. The study will focus on critically ill children as very little is known in this area. It shall add to the body of knowledge about QOC and help in addressing issues of QOC in the country. The findings will be like an audit for improvement of services where there is deficiency and it shall also reinforce the positive outcomes. This study is also a partial requirement for the attainment of a MMed degree in Paediatrics and Child Health for the principal investigator.

Study procedures

After obtaining written informed consent from the caregiver and healthcare provider, the data will be collected from 107 participants including the above mentioned strata. This study will be conducted over a period of 3 months during which several data collection techniques shall be employed in collecting information regarding QOC. These techniques will range from observation, KIIs (which shall include recording of the interview), the use of semi structured questionnaires and document analysis. The results will be disseminated to MUHAS and MNH administration department of paediatrics and child health. By doing so, it shall help to bring about a collaborative solution to the challenges we face in QOC. It shall also provide room for more researches to be conducted in this area.

Risks and benefits to the participant

No risks are directly related to the study as it is observational. Management of patients shall continue with no interruption from the principal investigator or assistants. The benefits will be participation in a study that will result in better management of critically ill children at MNH.

Confidentiality

The data collection sheet is strictly confidential. Your name will not appear in it and your telephone number is strictly for follow up purposes.

The interview which is recorded shall strictly be used for the purpose of this study and for analysis.

Participant information

Your participation in this study is voluntary and failure to participate or withdrawal from the study will not affect your management in any way at any stage.

Contacts and Questions

The researcher conducting this study is Dr. Remtullah, Aleya Zulfikar

Can be reached by email: sisaleya@gmail.com

Mobile number: 0715-208507

If you have any questions or concerns regarding the study and would like to talk to someone other than the researcher, you are encouraged to contact Dr. Joyce Masalu, the Chairman of the University Senate research and publications, MUHAS P.O.BOX 65001, Dar es Salaam. Telephone (+255) 222-152-489

Part B

Participant consent form (Has to be signed by parent or guardian)

I have understood the above information which has been fully explained to me by the investigator and I voluntarily consent to participate. I also consent to be recorded for the interview.

Signature……

Or participants thumb print.

Date……

Witness signature……

Appendix II: Ridhaa ya kushiriki katika utafiti-Kiswahili Version

Study title: Quality of healthcare among children admitted in Acute Paediatric care Unit at Muhimbili National Hospital.

Idhini ya Kushiriki

Habari,

Nakukaribisha kushiriki katika utafiti unaofanywa na Aleya Zulfikar Remtullah, mwanafunzi kutoka katika chuo kikuu cha Afya na sayansi za tiba za asili Muhimbili. Aleya Zulfikar Remtullah anafanya utafiti huu kwa ajili ya stashahada ya uzamili ya Tiba (MMED)

Kushiriki kwako katika utafiti huu ni kwa hiari unatakiwa kusoma taarifa zote katika fomu hii na kama kuna swali kuhusu jambo lolote ambalo halikueleweka unaweza kuuliza kabla hujaamua kushiriki au kutokushiriki katika utafiti huu. Umeombwa kushiriki katika utafiti huu ili kuboresha huduma za afya kwa watoto waliolazwa hospitali kuu ya Muhimbili.

Madhumuni ya utafiti

Dhumuni la utafiti huu ni kukusanya taarifa kuhusu ubora wa huduma za afya kwa watoto waliolazwa katika kitengo cha watoto mahututi katika hospital ya rufaa ya Muhimbili.

Ushiriki

Ushiriki wako katika utafiti huu ni wa hiari na una haki ya kukataa kushiriki katika utafiti. Kama umekubali kushiriki utatakiwa kuweka sahihi yako katika fomu hii na kujibu maswali utakayokuwa unaulizwa na msahili.

Faida

Hamna faida ya moja kwa moja kwa wewe kushiriki katika utafiti huu. Ila matokeo ya utafiti huu yatasaidia katika uboreshaji wa huduma za afya zinazotolewa kwa watoto mahututi wanaolazwa katika hospital za serikali.

Hasara

Hakuna hasara za moja kwa moja zitakazotokana na utafiti huu.Washiriki wataulizwa maswali kwa mahojiano na msahili ambapo watakuwa na uhuru wa kutoa majibu na mawazo yao kutokana na maswali watakayoulizwa.

Malipo

Hakutakuwa na malipo yoyote kutokana na ushiriki wa utafiti huu na pia kama mshiriki hutakuwa na gharama zozote za wewe kushiriki katika utafiti huu.

Usiri

Taarifa zote zitakazo kusanywa zitashughulikiwa kwa usiri wa hali ya juu na pia zinatolewa kwa ruhusa yako maalum kutokana na taratibu na sheria. Jina lako halitatumika katika taarifa zozote zitakazopatikana katika utafiti huu. Pia tunaomba uturuhusu kurekodi mazungumzo tutakayofanya wakati tunakusanya taarifa za utafiti huu.

Fomu ya utafiti

Nakiri kwamba nimesoma maelezo yote kwa umakini na nimeelewa kila kilichoandikwa katika fomu hii. Ninaelewa kwamba ninaweza kujitoa muda wowote nitakaotaka kujitoa.

Mawasiliano

Kwa mawasiliano zaidi kuhusu utafiti huu Unaweza kuwasiliana na mtafiti, Aleya Z Remtullah kutoka chuo kikuu Muhimbili, S.L.P 65001,Dar es Salaam au kama kuna maswali kuhusu haki zako kama mshiriki unaweza kuwasiliana na Dr. Joyce Masalu, Mwenykiti wa kamati ya utafiti na machapisho, MUHAS S.L.P 65001, Dar es Salaam. Simu (+255) 222-152-489

Je Unakubali Kushiriki? Ndio..... Hapana.....

Mshiriki amekubali..... Mashiriki amekataa.....

Mini, …… Nimesoma maelezo yote katika fomu hii na maswali yangu yameweza kujibiwa.Nakubali kushiriki katika utafiti huu.

Sahihi ya Mshiriki..... Tarehe ……

Sahihi ya Msahili ……..... Tarehe ……

Appendix III: Observation Checklist

NUMBER	STRUCTURE	YES	NO
1	Are the hospital grounds clean?		
2.	Are the floors, windows, doors, ceilings and walls intact? If not, describe		
3.	Does APCU have a vector control measure in place? If yes, what exactly?		
4.	Does the natural and artificial lighting enable the provision of safe and quality services?		
5.	Are there signs in place to stop patients and non-clinical staff from entering the APCU? Readable?		
6.	Is running water available at all times?		
7.	Is the APCU well ventilated? Spacious?		
8.	How many beds are present?		
9.	Are there facilities to accommodate the caregivers?		
10.	Are waste bins emptied at regular intervals?		
11.	Are waste bins labelled, colour coded and covered?		
12.	Is there a sharps disposal box? Is it emptied regularly?		
13.	Are the bed sheets taken for laundry? At what interval?		
14.	How frequently are bed sheets changed?		
15.	Are there mosquito nets present? Clean and intact?		
16.	Is there a hand washing sink with soap and hand sanitizer?		
17.	How many washrooms are present within APCU? For HCPS and caregivers? Functional? With a flushing system?		
18.	Are the washrooms clean and accessible?		
19.	Are there structures in place for disabled caregivers or patients? (rails, ramps)		

20.	Is there a backup generator which is functional in case of power cuts? How long till it goes on after a power cut?		
21.	Is there presence of available and accessible emergency drugs and equipment? Consistently?		
22.	Are the drugs well labelled and shelved?		
23.	Are the drugs stored away from reach of children and non-clinical staff?		
24.	Is there a refrigerator to store certain emergency and patient medications? Is it functional?		
25.	What is the nurse to patient ratio?		
26.	What is the doctor to patient ratio?		
27.	Is there an up-to-date version of treatment guideline? Which year?		
28.	Is there a list of qualifications of available staff?		
29.	Are the staff in APCU trained for medical emergencies? When where they last updated?		
30.	Are patient treatment charts available together with other necessary stationery?		
31.	Is there a private area for each patient especially during clinical assessment and procedures?		
32.	Are there appropriate patient transport vehicles in place for critically ill children?		

Appendix IV: Semi structured questionnaire caregivers

NUMBER	QUESTIONS				
1.	How long did it take to receive medical attention since arrival into APCU?	Time			
2.	By doctors? Nurses?	Doctors	Nurses		
3.	What was done on admission?				
4.	Was it communicated to the caregiver?	Yes	No		
5.	Was management initiated immediately?	Yes	No		
6.	Investigations done, were they explained and communicated to the caregiver?	Yes	No		
7.	How long did it take to get the laboratory/radiological results?	Immediately	Few minutes/hours	Days	Doesn't know
8.	Was the caregiver given feedback about the investigations done?	Yes	No		
9.	For radiological investigations, how was the patient transported? If yes, means of transport	Wheelchair	Stretcher	On foot	Carried
10.	Was it far from the APCU?	Yes	No		

11.	Were medications given?	Yes	No		
12.	Was it communicated to the caregiver what those medications were for?	Yes	No		
13.	And the possible side effects?	Yes	No		
14.	How was the communication with the HCPS?	Very satisfied	Satisfied	Not satisfied	Very upset
15.	Were the HCPS attentive to your child's needs?	Yes	No		
16.	Was the staff friendly and empathetic to the patient's condition?	Yes	No	Some	
17.	Did the caregiver have enough time for consultation during rounds?	Yes	No		
18.	Were the patient files and documents stored in a way to ensure confidentiality and privacy of information?	Yes	No		
19.	Was there a good team work within the HCPS?	Yes	No		
20.	In an emergency, was the caregiver explained and updated about patient condition?	Yes	No		

21.	During discharge, how sufficiently were instructions, progress and prognosis given at the time of discharge?	Sufficient	Average	Not sufficient	None
22.	By whom?	Doctor	Nurse		
23.	Following the death of your child, was the CG given sufficient information on patient condition?	Sufficient	Average	Not sufficient	None
24.	Was the cause of death communicated to the CG?	Yes	No		
25.	Was caregiver educated about patient condition and preventive measures prior to discharge?	Sufficient	Average	Not sufficient	None
26.	Level of satisfaction of services provided	Very satisfied	Satisfied	Not satisfied	

Appendix V: Semi structured questionnaire HCPs

NUMBER	QUESTIONS				
1.	How long did it take to receive medical attention since arrival into APCU?	Immediately	Few minutes	Few hours	
2.	By doctors? Nurses?	Doctors	Nurses		
3.	What was done on admission?				
4.	Was the diagnosis made?	Yes	No		
5.	Was it communicated to the caregiver?	Yes	No		
6.	Was management initiated immediately?	Yes	No		
7.	Investigations done, were they explained and communicated to the caregiver?	Yes	No		
8.	How long does it take to get the laboratory/radiological results?	Immediately	Few minutes	Few hours	
9.	Feedback communicated to the caregiver?	Yes	No		
10.	Was the patient transported for investigations?	Yes	No		
11.	By what means?	On foot	Wheelchair	Stretcher	
12.	Were medications given?	Yes	No		

13.	Was it communicated to the caregiver what those medications were for?	Yes	No		
14.	And the possible side effects?	Yes	No		
15.	How was the communication with the caregiver?	Clear and understood	Partial	None	
16.	Did the HCP allocate enough time for consultation during rounds?	Yes	No		
17.	Were the patient files and documents stored in a way to ensure confidentiality and privacy of information?	Yes	No		
18.	Was there a good team work within the HCPS?	Yes	No		
19.	During an emergency, how long was the response time?	Immediately	Few minutes	Few hours	
20.	Was the doctor informed?	Yes	No		
21.	What was done during an emergency situation?				
22.	Are all vitals taken on time	Yes	No		
23.	At what interval?	Time			
24.	Are abnormal vitals	Yes	No		

	documented?				
25.	Abnormal vitals communicated to the doctor?	Yes	No		
26.	Abnormal vitals communicated to the caregiver?	Yes	No		
27.	During discharge, how sufficiently were instructions, progress and prognosis given at the time of discharge?	Sufficient	Okay	Not sufficient	None
28.	By whom?	Doctor	Nurse		
29.	Was caregiver educated about patient condition and preventive measures prior to discharge?	Sufficient	Okay	Not sufficient	None

Appendix VI: KII interview guide

WARD:

DATE:

INTERVIEWER:

INTERVIEWEE:

DESIGNATION:

QUESTIONS:

1. What do you generally understand about quality of healthcare?
2. According to your description, who requires quality healthcare and why?
   PROBE: Does it apply to critically ill children? Why?
3. As described by donabedian model, QOC entails three things. Structure, process and outcomes. In terms of structure, do you think the APCU at MNH, provides a conducive environment for provision of quality healthcare to critically ill children? Why?
   PROBE: What needs to change (in terms of structure) for provision of QOC in APCU at MNH?
4. In terms of process, how would you describe the services, you as the HCPs, are providing for the children at APCU?
   PROBE: is it sufficient for the desired outcome of survival to discharge? If yes, how? If no, what needs to improve?
5. What, in your opinion, is required to bring the change you would like to see in APCU?
6. How would you describe the overall outcomes in terms of survival to discharge and death in APCU?
   PROBE: what is contributing to these outcomes?