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Original Research Article

Determinants of Referral among Patients Transferred for Emergency Surgical Operation from Second Level Hospitals to Tertiary Level Hospital in Dar Es Salaam Region, Tanzania

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Abstract: ***Objective*:** To assess the determinants of referred patients for emergency surgical operation from second level hospitals to tertiary level hospital (MNH) in Dar es Salaam region, many surgical patients with surgical emergency conditions are referred to tertiary level hospitals; little information is documented for the determinants of referral of general surgery patients for emergency operations, instead of patients being operated at second level hospitals. ***Methodology*:** The study design was cross-sectional descriptive hospital-based study, conducted at emergency department of MNH in period of five months, from June – October, 2013. A total of 363 patients were referred from second level hospital to tertiary level hospital in Dar es Salaam region during the study period. ***Results*:** The determinants grouped into four main groups and several small sub groups in each main group. The main groups include type of Disease/diagnosis, Shortage or lack of medical personnel, Shortage or lack of equipment in the theatre and at the laboratory, and lastly the insufficient infrastructures. The data analysis showed that the majority of the referred patients require emergency surgical operations. The total of 363 patients referred, 62.5% of patients required urgent attention and the remaining 37.5% were cold cases. The musculoskeletal conditions was the leading referral disease 50.7%, about half of all referrals, followed by gastrointestinal diseases 26.7% and then neurological disease 11.3%. Lack or shortage of the health personnel were as follows; The leading shortage of personnel was about 36.6% referrals was due to the shortage of General Surgeons, 29.8% due to shortage of Orthopaedic Surgeons and 15.15% referrals due to shortage of Neurosurgeons. The leading factor in lack of equipment was lack of investigation services about 33.3% referrals, lack of sterile gauze at the operating theatre was about 24.8% and lack of sterile trays for surgeries was about 18.5%. The leading factor in insufficient infrastructure was due to overcrowding of patients in the surgical wards about 68.9% of referred patients, due to few beds in the surgical wards, followed by lack of ICU facility about 16.0% of referred patients and overcrowding of patients waiting theatre service 15.2%. Majority of patients about 74.7% were referred by medical personal (not self referrals) and remaining about 25.3% were due to patient's request (self referral). Mwananyamala hospital was the leading hospital for referring many patients to tertiary level hospital. 53.4% patients were referred from Mwananyamala hospital, 35% from Amana hospital and 11.6% from Temeke Hospital. ***Conclusions*:** The determinants of the referred surgical patients showed some similarities and difference in some aspects, to other studies done in Tanzania and Africa. High rate of referral of general surgical patients for emergency treatments to tertiary level hospital could be minimized if theatre and surgical clinics standards and management are followed at the second level facilities.

Keywords: Determinants, referred surgical patients, Second level hospital and tertiary level hospital.

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INTRODUCTION

General overview of the problem

The National Health Policy is aimed at providing direction towards improvement and sustainability of the health status of all the people in the country, by reducing disability, morbidity and mortality. Also, improving nutritional status and raising life expectancy. The policy recognizes that, good health, including the improvement in surgical services to the community [50].

According to the standard of health service, the general surgical patients require access for emergency operations at second level hospitals. The second level hospitals are referral hospital for lower-level health facilities. However, many patients are referred again to Tertiary level hospitals for investigation, consultations, ICU care and for emergency surgical operations [7].

The study on the total number of patients referred to Muhimbili National Hospital in 2007 from lower-level hospital, for emergency operation revealed that; about 36.6% of the referred patients were general surgery patients [7]. The referred patients were for consultations, emergency operations and for investigations. The self referrals patients, may be do to mistrust of the services provided at second level hospitals [7].

Another study to evaluate the capacity of the first referral health facility in Tanzania, to performing basic surgical procedure in attending emergency patients, the results of this study revealed a significant gap existing in the capacity for emergency and essential surgical services in Tanzania [63].

The health facility in Tanzania is organized like a pyramid into six levels. level 1 facilities are dispensaries, Level 2 facilities are health centers and first-level hospitals, Level 3 facilities are district hospitals, Level 4 facilities are regional referral hospitals, Level 5 facilities are zonal hospitals and national/tertiary hospital (Muhimbili national hospital) and Level 6 are the very specialized referral hospitals (e.g. Kibongoto for TB, and Mirembe Mental Hospital), in level 6 are for disease specific conditions [35].

The standard of service at the second level hospital, it should be maintained and fulfilled accordingly, for example South Africa has introduced a hospital service package with a set of norms and standards for district hospitals. The Second level hospital provides all basic specialty services and develops super-specialty services gradually [8, 12].

Apart from other service provided by second level hospitals in other specialties, should be able to attend cold and hot surgical case. (surgical OPD and IPD cases, indoor and emergency service, accident and trauma services). This ensures the provision of special care to all patients including emergency surgical cases at second level hospitals [8, 12].

METHODOLOGY

Description of the study area

The study was conducted at emergency department of Muhimbili National Referral Hospital, the tertiary level hospital. Other information obtained from all three Dar es Salaam regional referral hospitals, the second level hospitals (Amana, Temeke and Mwananyamala Hospitals).

Muhimbili National Referral Hospital as university teaching Hospital, with 1500 beds facility, attending 1000 to 1200 out patients per week, admitting 1000 to 1200 in patients per day. The received patients with isolated skeletal, bead and spine injuries at Muhimbili Emergency Department are referred for management to MOI.

Dar es Salaam is a big City of around 4 million inhabitants. The Dar es Salaam population is more sophisticated and demanding. “Temeke District is the southernmost of three districts in Dar es Salaam, Kinondoni district located to the far North of the city, and ilala being located in the central area of Dar es Salaam City. To the East is the Indian Ocean and to the South and West is the Coastal region of Tanzania”. Based on the 2012 population and housing census, Dar es Salaam had 4,364,541 inhabitants of whom 2,125,786 were males and 2,238,755 females. Of the three Municipalities, Kinondoni Municipalities had the highest population with a total of 1,775,049 inhabitants, followed by Temeke Municipalities with 1,368,881 and Ilala Municipalities with 1,220,611 inhabitants [5].

Study type

Cross sectional descriptive hospital-based study was used to assess the determinants of referred patients for emergency surgical operation to tertiary level hospital (MNH) from second level hospitals at Dar es Salaam region.

Variables and data collection procedures

These variables included age, sex, diseases, health personnel, hospital infrastructure and medical supplies. All enrolled patients were first resuscitated at the Department of Emergency Medicine before being interviewed and the data collected.

1. Dependent variable; rate of referral of patients for emergency operations
2. Independent variable; age, sex, disease or diagnosis, hospital infrastructures, medical supplies and medical personnel.

Description of the study and target population

The study population is all surgical patients referred to Muhimbili National Hospital from Temeke, Amana and Mwananyamala second level hospitals at Dar es Salaam region between June – October, 2013. The

data collected at emergency department of Muhimbili National Hospital to all patients fulfilled the inclusion criteria.

Inclusion criteria

ONLY general surgery patients recruited in this study. The target population is all general surgery patients form Dar es Salaam region, referred to Muhimbili national hospital a tertiary hospital during the period of study [52].

Exclusion criteria

BUT all obstetrics patients were excluded from the study and referred surgical patients from private hospital and other hospital outside the Dar es Salaam region were excluded too.

Sampling procedure and sample size.

Sampling method: purposeful sampling to include all general surgical patients referred to Muhimbili national tertiary hospital for emergency surgical operation during the period of the study.

The sample size was estimated from the following formula;

$$\textbf{Sample size; } N = \frac{Zx^2\, p(1-P)}{d^2} \textbf{ or } \frac{Zx^2\, p(100-P)}{d^2}$$

$$\frac{(1.96)^2 x 0.37 x 0.63}{(0.05)^2} = 358$$

N is required sample size
Z is the point on standard normal distribution (critical value) = 1.96 (when x = 0.025)
P is proportion = 36.6% or (0.37)
(Daudi O. Simba *et al.*,)
D is margin of error interval (5%)
N = 358

The minimum sample size obtained was 358 patients and the power of the study of 80%, employs 95% Cl. In this study 363 patients referred for emergency general surgery operation to Muhimbili National hospital during the period of study and all 358 patients were included in the study.

Data collection

The principal investigator and assistant research collected data by filling referral forms with several questions, it was conducted by personal face-to-face, both closed and open-ended questions used. Manual analysis was carried out through sorting out all the questionnaires collected. Data were entered in the computer by the principal investigator followed by data cleaning. Also, data from referral forms from Dar es Salaam municipal hospitals and some of patient register books records from municipal hospitals were used to fill up gaps of collected data. The checklist used to store collected information and other information obtained from medical staff.

Data processing and Analysis

The collected data were recorded into the checklist for storage of information and checked by the research team for completeness and consistency. The collected quantitative data interred, processed and analyzed by using statistical package for the social science (SPSS) version 16. The procedure was using cross tabulation where proportions were compared using statistical Chi-square test. The result from each table, pie charts and bar chat discussed and association from each issue outlined. Ally results were analyzed accordingly and reported to the research report.

Ethical consideration

Before starting the research, clearance was obtained from HKMU ethical research board (ethical committee health science research and publication committee) be obtained and written document from involved municipal hospital and MNH administration.

Patients were asked to provide written consent, for their referral records to be used in the study. All collected information was anonymous and high confidentiality was observed during data analysis. Data analysis was performed by SPSS program and information stored by computer.

The participant was informed about his/her participation in the study that will involve filling of questioners and participants were informed about the benefit of the study. The results of the study can help to improve management of surgical patients. No harm or risk was noted in this study. The study was conducted to all patients agreed to participate in the study.

Study limitations

This study was done at short period and it was at the mid of the year, it may not represent the picture in the whole year. Thus, the findings may have limitation to the actual image of the magnitude of determinants of referrals of referred patients to tertiary level hospitals from second level hospitals for emergency surgical operations at Dar es Salaam region.

RESULTS

Patient's demographic characteristics

During the study period 363 patients referred to Muhimbili National Hospital at emergency department for general surgical diseases from second level hospital in Dar es Salaam region. Males were 293 (80.7%), female were 70(19.3%) and the male female ration is 4.2:1. The majority of referred surgical patients about 234 (64.5%) patients were in age group (31 – 40) years of age.

The result showed that, the determinants grouped into four main groups and several small sub groups in each main group. The main group include type of disease/diagnosis, shortage or lack of medical personnel, shortage or lack of equipment in the theatre and at the laboratory, and lastly the insufficient infrastructures.

Table 4.1: Frequency table of gender of respondents (n=363)

	Frequency	Percent
Valid Male	293	80.7
Female	70	19.3
Total	**363**	**100.0**

Out of the 363 patients referred to Muhimbili national hospital for emergency general surgeries, the result shows most were male patients. The 293(80.7%) of referred patients were males and 70(19.3%) referred patients were females. See table 4.1

Table 4.2: Frequency Table: age of respondents (n=363)

	Frequency	Percent
Valid 0 - 10 years	50	13.8
11 - 20 years	6	1.7
21 - 30 years	73	20.1
31 - 40 years	234	64.5
Total	**363**	**100.0**

The result shows that, majority of patients with surgical disease were referred to tertiary level hospital for emergency operations were on age group of (31-40) about 234(64.5%) and followed by (21-30) about 73(20.1%). See table 4.2

Table 4.3: Frequency Table: diseasses of respondents (n=363)

	Frequency	Percent
Valid Gastrointestinal d'ses	97	26.7
Respiratory T. d'ses	21	5.8
Musculoskeletal d'ses	184	50.7
Malignant d'ses	6	1.7
Urology d'ses	10	2.8
E.N.T d'ses	4	1.1
Neurological d'ses	41	11.3
Total	**363**	**100.0**

The table 4.3 shows the disease distribution among the referred patients. The musculoskelrtal disease 184(50.7%) is the leading referral disease about half of all referrals, followed by gastrointestinal diseases 97(26.7%) and then neurological disease 41(11.3%). The E.N.T condition is about 4(1.1%) the lowest frequency of referred disease.

Table 4.4: Frequency Table of referred patients (n=363)

Emergency Surgery	Frequency	Percent
Valid Yes	227	62.5
No	136	37.5
Total	**363**	**100.0**

The analysis of the data showed, most of the referred patients required emergency surgical operations. The table 4.4 shows out of 363 referred patient to Muhimbili national hospital 227(62.5%) patients were for emergency operations. The total of 227 (62.5%) patients were having diseases requires urgent attention. Remaining 136(37.5%) patients were cold cases; they referred due to other reason apart from emergency operation.

Referred patients due to shortage/lack of medical personnel

The result revelled that, lack or shortage of medical personnel is among the determinants of surgical

patient's referral to Muhimbili National Hospital. The referral of patients to Muhimbili National hospital due to lack or shortage of health personnel is outlined in the table 4.5. the frequency of referred patients shows the level of the availability of the health personnel at the given facility, higher rate of referred patient to specific department can justify the shortage level of particular personnel in that department. For example, in the frequency column about 133 patients referred to MNH in order to be attended by general surgeon. The shortage of general surgeons at the second level hospitals causes the higher rate of the referral of patient to tertiary hospital.

Table 4.5: Frequency Table of referred patients due to shortage/lack of medical personnel (n=363)

Shortage of personnel

Medical personnel	Frequency	Percent
Valid E.N.T surgeons	22	6.1
Neurosurgeons	55	15.2
Orthopedic surgeons	107	29.5
Urologists	12	3.3
Gastroenterologists	20	5.5
General surgeons	133	36.6
Anesthesiologists	14	3.9
Total	**363**	**100.0**

The analysis outlined shortage and lack of health personnel of various range. The shortage impairs the continuation of treatment of the patients at the facility. The table 4.5 above demonstrates the frequency of referrals of patients due to lack or shortage of the health personnel in the second level hospitals. The leading shortage of personnel is about 133(36.6%) referrals were due to the shortage of Generals Surgeons, 89(29.8%) due to shortage of Orthopedic Surgeons and 55(15.15%) referrals due to shortage of Neurosurgeons. Other shortage of staff are E.N.T surgeons 17(6%), gastroerologist 20(5.5%), urologist 12(3.5%) and lastly anesthesiologist 14(3.9%).

Table 4.6: Referred patients due to Lack /shortage of equipments and medical supplies in operating theatre (n=363)

Medical personnel	Frequency	Percent
Valid Lack of gauzes	90	24.8
Lack of different trays for surgery	67	18.5
Lack of antiseptics	22	6.1
Lack of anesthesia agents	7	1.9
Lack of sophisticated investigation	121	33.3
Lack of essential equipments	56	15.4
Total	**363**	**100.0**

The shortage of medical supplies in the facility due to any reasons affect scheduled operation, mainly the elective operation and emergency general surgeries operations. Table 4.6 shoes lack of various equipments which contributed to the referrals of the patient to higher level hospital. The leading factor in lack of for emergency operation because of lack of more accommodation to the patients at the second level hospitals. Other factor like many patients waiting the theatre service (long listing) due to few theatre rooms or lack of ICU service because of the facility does not have ICU.

4.7 Insufficient infrastructure

The insufficient or substandard infrastructure was described by overcrowd of the patients due to small surgical wards or the few number of beds in the ward, availability of ICU service and the access of theater service. Overcrowd of the patient at the surgical wards due to few beds were leading determinant in this section, for about 250 patients referred to tertiary level hospital

Even if the number of health personnel in health facility is enough, the substandard infrastructure can impair health service because without enough beds patients will not be admitted, without theatre rooms no operation will be done and without ICU, all patient requires pre or post operative ICU service will not be attended. The failure to attend these patients will increase rate of patient's referral to tertiary level hospital.

Table 4.7: Frequency Table: insufficient infrastructure (n=363)

	Frequency	Percent
Valid Small surgical ward	250	68.9
Many patients for surgery	55	15.2
Lack of ICU	58	16.0
Total	**363**	**100.0**

The substandards of infrastructure can contribute to higher rate of referrals, without association with other factors. The above table 4.7 shows, other factors contributing to the referral of the patients to the tertiary hospital. The leading factor in insufficient infrastructure is due to overcrowding of patients in the surgical wards about 250(68.9%) referred patients, followed by lack of ICU facility at the secondary level hospitals about 58(16.0%) of referred patients and higher number patients are waiting theatre service 55(15.2%).

Table 4.8: Patient referral decision to tertiary level hospital (n=363)

	Frequency	Percent
Valid Yes	92	25.3
No	271	74.7
Total	**363**	**100.0**

The referral of the patient to higher level hospital is the decision made by the medical personnel reviewed the patient and find the benefit of referring the patient, or otherwise in case when patient or relative requesting the referral. Majority of referred patients reviewed by attending medical personnel then decision of referral made. Table 4.8, shows most of patients referred to tertiary level hospital were not due to patient's request. But 271(74.7%) referred by medical personnel attended them and about 92(25.3%) due to patient's request (or self referral).

Table 4.9: Frequency Table Dar es Salaam municipal Hospitals and the frequency of referred patient (n=363)

Name of Hospital	Frequency	Percent
Valid Amana	127	35.0
Mwananyamala	194	53.4
Temeke	42	11.6
Total	**363**	**100.0**

Table 4.9 shows the results of frequency of referred patients in each hospital at Dar es Salaam region. Mwananyamala hospital is the leading hospital for referring many patients to tertiary level hospital 194(53.4%) referred patients from Mwananyamala hospital, 127(35%) referred patients from Amana Hospital and lastly 42(11.6%) referred patients from Temeke Hospital.

Association of the variables

i) Association of referred emergency patients and demographic characteristics.

Table 4.10: Emergency Surgery * Age of Respondent Crosstab

	Age of Respondent				P-value
	0 – 10 years	11 - 20 years	21 - 30 years	31 - 40 years	
Emergency Surgery Yes Count % within Emergency Surgery	19 8.4%	3 1.3%	45 19.8%	160 70.5%	001
No Count % within Emergency Surgery	31 22.8%	3 2.2%	28 20.6%	74 54.4%	

Results revealed that majority 160(70.5%) of referred surgical patient were aged (31-40) years and were for emergency operations, the difference between age group and need for emergency operation was statistically significant. Table 4.10

Table 4.11: Emergency Surgery * Gender of Respondent Crosstab

	Gender of Respondent		P-value
	Male	Female	
Emergency Surgery Yes Count % within Emergency Surgery	194 85.5%	33 14.5%	003
No Count % within Emergency Surgery	99 72.8%	37 27.2%	

Also Results revealed that majority 194(85.5%) of referred surgical patient were male and were for emergency operations, the difference between sex and need for emergency operation was statistically significant, table 4.11.

ii) Association of referred emergency patients and disease/diagnosis.

Table 4.12: Emergency Surgery * diseases

	Diseases							P-value
	GIT d'ses	Res T. d'ses	MS d'ses	Malignant d'ses	Urology d'ses	E.N.T d'ses	NS d'ses	
Emergency Surgery Yes Count	82	12	105	3	6	4	15	000
Emergency Surgery % within	36.1%	5.3%	46.3%	1.3%	2.6%	1.8%	6.6%	
No Count	15	9	79	3	4	0	26	
Emergency Surgery % within	11.0%	6.6%	58.1%	2.2%	2.9%	0%	19.1%	

Results revealed that majority 105(46.3%) of referred surgical patient were musculoskeletal disease and were for emergency operations, the difference between types of disease referred and need for emergency operation was statistically significant, Table 4.12 above.

iii) Association of referred emergency patients and shortage or lack of medical personnel.

Table 4.13: Emergency Surgery * Shortage of personnel

	Shortage of personnel							P-value
	E.N.T surgeons	Neuro surgeons	Orthopedic surgeons	Urologists	Gastroentrologists	General surgeons	Anaesthesologist	
Emergency Surgery Yes Count	12	23	71	7	15	90	9	0.027
Emergency Surgery % within	5.3%	10.1%	31.3%	3.1%	6.6%	39.6%	4.0%	
No Count	10	32	36	5	5	43	5	
Emergency Surgery % within	7.4%	23.5%	26.5%	3.7%	3.7%	31.6%	3.7%	

Results revealed that shortage of general surgeon is high, accounting for about 90 (39.6%) of referred surgical patient and were for emergency operations, the difference between needed/shortage medical personnel and need for emergency operation was statistically significant, Table 4.13 above.

iv) Association of referred emergency patients and insufficient infrastructures

Table 4.14: Emergency Surgery * Insufficient infrastructure

	Insufficient infrastructure			P-value
	Small surg. Ward	Many patients for surgery	Lack of ICU	
Emergency Surgery Yes Count	136	47	44	0.000
Emergency Surgery % within	59.9%	20.7%	19.4%	
No Count	114	8	14	
Emergency Surgery % within	83.8%	5.9%	10.3%	

Results revealed that insufficient infrastructure contributing to rate of surgical patient referrals. Small surgical wards/few beds in surgical wards accounting for about 59.9% of referred surgical patient and 136 patients were for emergency operations, the difference, Table 4.14 above.

v) Association of referred emergency patients and shortage or lack of medical supplies and equipments

Table 4.15: Emergency Surgery * Lack of Equipments Crosstab

	Lack of Equipments						P-value
	Lack of gauzes	Lack of trays for surgery	Lack of antiseptics	Lack of anaesthesia	Lack of sophisticated investigations	Lack of all essential equipments	
Emergency Surgery Yes Count	53	49	18	7	56	44	0.000
% within Emergency Surgery	23.3%	21.6%	7.9%	3.1%	24.7%	19.4%	
No Count	37	18	4	0	65	12	
% within Emergency Surgery	27.2%	13.2%	2.9%	0%	47.8%	8.8%	

Results revealed that shortage/lack of medical supplies is among of determinants, lack of sophisticated investigations accounting for about 24.7% of referred surgical patient and were for emergency operations, the difference between shortage medical supplies and emergency operation was statistically significant, Table 4.15 above.

vi) Association of referred patient and self referral

Table 4.16: Emergency Surgery * Patient's request Crosstab

	Patient's request		P-value
	Yes	No	
Emergency Surgery Yes Count	44	183	0.001
% within Emergency Surgery	19.4%	80.6%	
No Count	48	88	
% within Emergency Surgery	35.3%	64.7%	

Results revealed that majority of referrals were made by medical personnel, few self referrals observed. Self referrals about 19.4% of referred surgical patient and were for emergency operation, compare to 80.6% of referred patients by medical personal. Their difference to emergency operation was statistically significant, Table 4.16 above.

vii) Association of age of respondent and diseases;

Table 4.17: Age of Respondent * Diseases Cross tabulation Age of respondent *diseases Cross tabulation

	Diseases							P-value
	GS d'ses	RS d'ses	MS d'ses	Malignant d'ses	Urology d'ses	E.N.T d'ses	NS d'ses	
Age of 0 - 10 Count Respondent years	11	7	27	0	0	1	4	0.055
% within Age of Respondent	22.0%	14.0%	54.0%	.0%	.0%	2.0%	8.0%	
% within diseases	11.3%	33.3%	14.7%	.0%	.0%	25.0%	9.8%	
% of Total	3.0%	1.9%	7.4%	.0%	.0%	.3%	1.1%	
11 - 20 Count years	0	0	5	0	0	0	1	
% within Age of Respondent	.0%	.0%	83.3%	.0%	.0%	.0%	16.7%	
% within diseases	.0%	.0%	2.7%	.0%	.0%	.0%	2.4%	
% of Total								

	.0%	.0%	1.4%	.0%	.0%	.0%	.3%	
21 - 30 Count years	14	0	46	0	2	0	11	0.055
% within Age of Respondent	19.2%	.0%	63.0%	.0%	2.7%	.0%	15.1%	
% within diseases	14.4%	.0%	25.0%	.0%	20.0%	.0%	26.8%	
% of Total	3.9%	.0%	12.7%	.0%	.6%	.0%	3.0%	
31 - 40 Count years	72	14	106	6	8	3	25	0.055
% within Age of Respondent	30.8%	6.0%	45.3%	2.6%	3.4%	1.3%	10.7%	
% within diseases	74.2%	66.7%	57.6%	100.0%	80.0%	75.0%	61.0%	
% of Total	19.8%	3.9%	19.2%	1.7%	2.2%	.8%	6.9%	

The results show the association of age and disease of referred patients. Table 4.17 above. Ages of respondent and disease cross tabulation shows majority patients with the age group (31 - 40) about 234 patients, out of 363 patients, of all referred to tertiary hospital for emergency operation. Out of 234 referred patients, 106 patients were due to musculoskeletal disease and in the same age group gastrointestinal disease followed by about 72 of referred patients, lastly about 25 patients referred due to neurosurgery disease. Other age groups show similar pattern of disease and age associations. Majority of the patients referred in all age groups were due to musculoskeletal, gastrointestinal and neurosurgical disease. Their associations show statistical significance.

Table 4.18: Hospital and number of specialist available

S/n.	Type of specialty	Amana Hospital	Temeke Hospital	Mwananyamala Hospital
1.	General surgeon	2	2	3
2.	Orthopedics surgeon	-	1	-
3.	Neurosurgeon	-	-	-
4.	Urologist	-	-	-
5.	Gastroenterologist	-	-	-
6.	ENT surgeon	-	-	-
7.	Anesthesiologist	-	-	-

ICU service and theatre rooms

All three second level hospitals in Dar es Salaam do not have ICU service. Temeke hospital has three theatre rooms, two operating rooms for obstetrics case and one shared by gynaecology case, general surgery case and orthopaedics case. Both Amana hospital and Mwananyamala hospital has two theatre rooms respectively. One operating room is for obstetrics case and one shared by gynaecology case and general surgery case. In all three hospitals no operating room was allocated only general surgical operations. Hence in any obstetrics emergency elective operation in general surgery will be postponed.

DISCUSSION

The main objective of this study was to determine the determinants of referred general surgical patients with emergency conditions to tertiary level hospital for emergency operation in Dar es Salaam region. The referral of the patients from lower level hospital to higher level hospital is recommended whenever there is a need. But all health service levels are supposed to deliver standard service according to their level, despite of various obstacles facing these health facilities [8, 9].

Dar es Salaam region has three second level hospitals, Temeke hospital, Amana hospital and Mwananyamala hospital, all hospitals are second level hospitals. Muhimbili National hospital is tertiary level hospital and acts as zonal referral hospital for the Eastern Zone. Mwananyamala hospital is the leading hospital for referring many patients to tertiary level hospital, about 53.4% patients from Mwananyamala hospital, 35% referred patients from Amana hospital and lastly 11.6% referred patients from Temeke hospital. Temeke hospital is the only one hospital with orthopaedics surgeon at the Municipal hospitals but further study is required to determine reasons of few referrals from Temeke hospital, compare to other two hospitals.

The results in this study showed various determinants leading to the referral of emergency surgical patients to Muhimbili national hospital for emergency operation. The determinant outlined in this study can be grouped into main major groups and several sub groups in each main group.

The major groups are as follows; Disease of the patients which is the majority of all determinants, followed by availability of health personnel needled to attend the patients, insufficient infrastructure and lack/shortage of medical supplies.

Similar results of determinants were outlined in study of Simba *et al.,* 2004 conducted at Muhimbili national hospital. Most of the factors or determinants are similar to that of referrals of other patients in other departments, but in this study, it was shown that, insufficient infrastructure and the lack/shortage of medical supplies in surgical service plays a greater role in the referrals of patients.

The analysis of the data showed, most of the referred patients require emergency surgical operations. This study showed that out of 363 referred patients to Muhimbili national hospital 227 (62.5%) patients were having diseases requiring urgent attention. The remaining 136(37.5%) patients were cold cases; referred due to other reasons apart from emergency operation.

The study showed that, the type of disease or severity of disease can determine the capacity of health facility, if it can be able to handle the patient or not. The main group of diseases was sub divided into musculoskeletal, respiratory/thoracic, gastrointestinal, malignant, urology, ENT and neurosurgery.

Majority of the patient referred due to musculoskeletal disease 50.7% which was the leading cause of referral, (about half of all referrals); followed bu gastrointestinal diseases 26.7% and then neurological disease 11.3%. The E.N.T condition was about 1.1% the lowest frequency of referred disease. In total of 184 referred patients with musculoskeletal disease 46.3% were for emergency operations.

Gastrointestinal diseases are second leading disease for referral to tertiary hospital about 26.6% in the main group of diseases. Majority of patients referred to tertiary hospital with gastrointestinal conditions were due to obstructed hernia, visceral injuries with poly-trauma and gastrointestinal condition with other morbid conditions (like anaemia, hypertension and diabetic).

The result are similar to the study done at Muhimbili by Ibenzi Ernest Njile; in his study of the "pattern and early treatment outcome of abdominal injuries at Muhimbili National Hospital Dar es Salaam". The results were statistically significant P- value 0.000.

The analysis outlined shortage and lack of health personnel of various range. The crisis of shortage of health personnel was another determinant. The shortage impairs the continuation of treatment of the patients at the facility. The main group of shortage or lack of medical personnel can be sub divided into the following; E.N.T surgeons, Neurosurgeons, Orthopaedic surgeons, Urologists, Gastroenterologists, General surgeons and Anaesthesiologists.

The leading shortage of personnel was due to the shortage of General surgeons; about 36.6% referrals were due to the shortage of General Surgeons, 29.8% due to shortage of Orthopaedic Surgeons and 15.15% referrals due to shortage of Neurosurgeons. Other shortages of staff were E. N. T surgeons 6%, gastroenterologist 5.5%, urologists 3.5% and anaesthesiologists 3.9%.

Results revealed that out of 133 referred patients due to shortage of general surgeon, about 39.6% were for emergency operations. The difference between needed/shortage of medical personnel and rate of referral of emergency operation was statistically significant (P-value 0.027). similar result as in this study are those of Gideon K; Mughwira *et al.,* which revealed the crises of the shortage of health personnel in many health facilities. In almost all second level hospitals in Dar es Salaam region does not have orthopaedic surgeon except for Temeke hospital, no neurosurgeon no anaesthesiologist and no ENT surgeon. Few numbers of general in the second level health facilities contributes to the failure of attending many surgical patients at the surgical clinics and eventually elective operation for surgical conditions. Similar findings were observed in various studies including the study done at Muhimbili national hospital about 8 years ago [7, 11, 50]. The results showed crises of health personnel in most of health facilities.

The shortage of infrastructure in the facility affects scheduled operations. The main group of shortage or lack of infrastructure can be sub divided into; small surgical ward/few beds in wards, many patients waiting operation and lack of ICU. The leading factor in insufficient infrastructure is due to overcrowding of patients in the surgical wards about 68.9% referred patients, followed by lack of ICU facility about 16.0% of referred patients and higher number of patients waiting theatre service 15.2%. The results revealed that insufficient infrastructure contributed to rate of surgical patients referrals and the results was statistically significant P-value 0.000. Similar results were seen in study of Simba *et al.,* at Muhimbili national hospital. Insufficient infrastructure is another determinant. Second level hospitals have small capacity to accommodate many post operative patients because surgical wards are small, few beds and not well equipped to handle post operative complications. In case of Amana hospital, which is now promoted to be a regional hospital, it has only 44 beds in surgical wards.

Majority of these facilities does not have ICU at their hospitals. Patients with critical condition before and after emergency operation, require ICU service post operative for their condition to stabilize before admitted

to the normal surgical wards. Similar finding were observed on the study conducted in Tanzania on the Emergency and Essential Surgical Care (between March, 2009 and October, 2010) [11, 50]. The results showed insufficient of infrastructure in many health facilities.

The shortage of medical supplies in the facility due to any reasons can affect scheduled operation and emergency general surgery operations. The leading factor in the lack of equipments was lack of investigation services which was 33.3% referrals, lack of sterile gauze at the theatre is about 24.8%, lack of sterile trays for surgeries was about 18.5%, lack of essential equipments 15.4% and followed by lack of antiseptics 6.1%.

The fifty six referred patients due to Lack of sophisticated investigations, it's accounted for about 24.7% of referred surgical patient, with emergency conditions which needed urgent operations. The results were statistically significant (P-value 0.000). Similar results as in study of Simba *et al.,* at Muhimbili national hospital. Either other determinant which can increase rate of patient referrals was lack of investigations which help the medical personnel to reach to the diagnosis. The X-ray service in Orthopaedics and Neurosurgical patients is most important as basic investigation to confirm the diagnosis and for proper plan in management of patient conditions and in the failure of laboratory units to perform pre operative or post operative investigations.

Lack of various equipment contributed to the raise in referrals of patient to higher level hospital. The skull X-rays and CT. Scan service were the leading investigations, caused more referrals to orthopaedics and neurosurgery departments. Failure of proper function of sterilization unit can cause raise of the referral patients due to failure of sterilization of operation trays and gauze. In order for the operation to be performed at the theatre, the supply of sterile gauzes and sterile trays for surgeries should be adequate according to the theatre demands. Findings from other studies showed similar challenges of health service due to insufficiency in investigations and supplies [21, 45, 50,].

The referral of the patient to higher level hospital is the decision made by the medical personnel reviewed the patient and find the benefit of referring the patient, or otherwise in case when patient or relative requesting the referral. Majority of referred patients were reviewed by attending medical personnel then, decision of referral made. About 74.7% were referred by medical personnel that attended them and about 25.3% due to patient's request (or self referral). Few self referrals observed, but about 19.4% of self referred surgical patients were with emergency conditions. Their difference to emergency operation was statistically significant (P-value 0.001). contrary to the results of Simba et al which showed that, the majority of referred patients were self referrals.

The results revealed that, most of male patients with surgical disease were referred to tertiary level hospital for emergency operation. The 80.7% of referred patients were males and 19.3% referred patients were females (P-value 0.003). Many programs were introduced in health sector in order to prevent and to reduce child and maternal death. Through these programs, females receive more opportunity of access to surgical interventions, compared to males. The introduced programs give more priorities to well being for child and maternal (eg. Access to theatre facilities). This may be one of the reasons of higher number of male patients, in waiting list at surgical clinics, which reflected by high number of referrals of male patients to tertiary level hospital. Either male is more exposed to motor traffic accidents compare to female, as the result shows in this study, the leading cause of referral of the patient is due to trauma emergencies.

Also Results revealed out of 293 referred males, 85.5% of them were for emergency operations, the results were statistically significant (P-value 0.003). Similar results in pattern of sex distribution showed in study of 2012 Chalya *et al.,* conducted at Bugando Hospital.

The results showed the association of age and disease of referred patients. Majority of patients with musculoskeletal conditions are in this age group. About 234 patients are in the age group 31-40yrs and out of 234 referred patients, 106 patients were due to musculoskeletal disease and in the same age group gastrointestinal disease followed by about 72 of referred patients, lastly about 25 patients referred due to neurosurgery disease along the same age group. Other age groups show similar pattern of disease and age associations is (21-30) years. The leading referral disease in all age groups were due to musculoskeletal, gastrointestinal and neurosurgical disease. Their associations show statistical significance (P-value 0.055).

Generally, the age group between (21-40) years includes higher number of people in the population and majority of them are in working class in community. Similar picture was seen in the study conducted at Mwanza by Chalya *et al.,* showed high rate of patient with age group (21-30) yrs involved in road traffic crashes [40]. The results of this study showed high rate of trauma patients (musculoskeletal disease) referred to tertiary level hospital and majority of the patients, there age was (21-40) years.

The study conducted at USA 2002-2005 by Turrentine et al, evaluated surgical risk factors [51] and Giuliano *et al.,* in his study to evaluate age related surgery risk; he cited various studies conducted to show age related surgery risks [56]. The results from all studies showed raise of surgical risk with increase of age, the great risk is seen at sixty five years and above in elderly

and children (0-5) years is risk age. Higher referral of this patients to tertiary level hospital possibly were due to failure to manage age related surgical risk and post operative complications at second level hospital in health facility lacking ICU service.

Traumatic injuries secondary to motor traffic accidents and other causes, contributed a lot in musculoskeletal and in neurosurgery conditions. The musculoskeletal disease 50.7% and neurological disease 11.3% were major cause of referrals. Apart from shortage of health personnel to handle these conditions, also the higher rate of motor traffic accident caused larger number of the patients with orthopaedics and neurological conditions, which caused the overload of the surgical wards and theatre in the second level hospitals. Majority of referred patients with traumatic injuries were having fractures of extremities and head injuries. The study conducted at Mwanza by Chalya *et al.,* showed similar picture of traumatic injured patients "Musculoskeletal (60.5%) and the head (52.1%) were the most common body region injured" [40].

In this study, specifically in musculoskeletal and neurosurgery, man patients with fracture and head injuries were referred for investigations then for further managements at Muhimbili Orthopaedics institute. Various studies conducted in Tanzania demonstrate a similar picture of higher rate of trauma patients secondary to motor traffic accidents. In the study conducted at Kilimanjaro by Hipolite Thomas, "results showed total number of reported accidents in Kilimanjaro region in 2008 was 906 while in 2009 it was 1,125 accounting for an increase of 24%. The total mortality reported in 2008 was 147 and 202 in 2009 with an increase of 37%. The total morbidity was 622 in 2008 and 933 in 2009 accounting for a 50% increase" [13].

Another study conducted at Dar es Salaam by Museru *et al.,* "results showed between 1990 and 2000 the number of road traffic accidents raise from a total of 10,107 to 14,548, an increase of almost 44%. The number of associated injuries increased by more than 42% from a total of 9,910 to 14,094 while that of death raise by more than 64% form a total of 1,059 to 1,737 deaths" [34] and another study conducted at Mwanza by Chalya *et al.,* [40], the results showed higher rate of surgical patients due to motor traffic accidents and they keep rising each year.

The referral of the patient to higher level hospital due to critical state is genuine reason, but inflow of many patients with emergency state at second level hospital expect to those due to traumatic cause, would not be the case is patient were attended at early stage of disease as elective case. The higher inflow of patients, reflect the underlined causes which can explain the failure of standard care to surgical patients. the failure starting from surgical clinics, surgical wards infrastructure and at the theatre.

The findings of other studies are similar to this study; most of referred patients were for emergency operations [7]. The poor management of the theatre and surgical clinic, lead to the end result of high number of patients in waiting list for operation and postponement of many surgical operations. Most of this referred patient can be attended at second level hospital, at early state of disease as elective case [41]. Majority of referred patients from second level hospitals were planned for elective operation, but patients were not attended timely.

CONCLUSION

The referral of the patients to tertiary level hospital for emergency operation due to disease as main group of determinants was high and lack or shortage of personnel was second leading cause of referrals. The majority of referred patients showed signs of emergency conditions, required emergency operation.

The referral of patients, if it follows the criteria of referral of patient to higher level hospital, is a standard approach of patient management. The lack or shortage of personnel was a major cause of referrals of patients, but during this study it was difficult to determine the detail of this factor because most of these referrals were done by junior medical personnel. It is true that, the number of general surgeons, orthopaedics surgeons or neurosurgeons is not adequate in most of the health facilities. But if the senior medical register or general surgeons are the one making decisions during the referral of the patient requiring emergency operation, the number of referrals will be reduced. This is reflected by the fact that, many referrals are made during night duties, when most of senior medical personnel are not around. The guide lines for patients managements should be introduced and been followed. Either patients should be referred only, by on call senior medical personnel. The availability of basic investigations at the facility is the key factor for proper treatment of patients, which can help to cut down the number of referrals; for example, all patients with head injuries were referred for further management at Muhimbili hospital due to lack of skull x-ray and CT-Scan service at second level hospitals. But if the skull X-ray and CT. Scan service were available the severity of the condition may be evaluated before decision of referral made. The basic investigation at radiology unity and laboratories should be available at all time, because the second level hospitals are required to attend emergency operations from inpatient and outpatient departments and these facilities are referral centres for lower level health facilities.

The infrastructures of the hospitals are overloaded due to the larger number of the patients who require surgical service. The access of few available operating theatre rooms is prioritised for well being of child and maternal health services; hence priority is given to obstetric operations than that of general surgery. ICU facility is important in attending emergency surgical

patient's pre operatively to some patients and post operative to most emergency surgical patients. all second level hospitals do not have ICU facility and when available, it is not equipped to attend critical patients with post operative complications and only a few beds are available.

The study showed the lower number of patients with self referral compared with other study conducted at Muhimbili National Hospital.

RECOMMENDATION

The findings of this study showed the need of conducting another study to evaluate and determine how is the management of operating theatres and surgical clinics practice at second level hospitals. This is due to the high number of patients in the waiting list at the surgical clinics and during operating day patients with emergency conditions are referred due long list for operation. Proper utilization of surgical clinics and operating theatres will reduce the surgical patients in waiting list.

The poor performance at the operating theatre can be measured by the failure to meet the target of scheduled operation list. This can be due to, poor performance against commencing first case on time target leading to operations to be cancelled on the day of surgery. The time management is the key, starting with the first case in the list up to all scheduled and emergency operations.

Supervision from senior medical personnel during referral process of the patients will help to reduce unnecessary referrals of patients. One of the criteria for referral of patient to tertiary level hospital for emergency operation should be the review from general surgeon or senior medical registrar before the referral is done.

Due to shortage of health personnel in orthopaedics and neurosurgery departments, the visiting tour of these staffs for attending patients and teaching medical personnel at second level hospital on how to attend those cases will reduce the referral rate of the patients. This must be accompanied by equipping the second level hospitals to be able to attend these types of conditions.

Lastly, the use of general surgery residents in second level hospital to be on call during night shift is important, because most of the referrals were recommended during the night, this will help to fill the gap of shortage of personnel in these facilities. The majority of referred emergency surgical cases to Muhimbili National Hospital are attended by the surgical residents on calls.

The improvement of health care to the surgical patients at second level hospitals by;

- Improving hospital infrastructure. Eg number of beds, theatre rooms and ICU
- Adequate resources for medical supplies and motivation to health personnel.

Either the improvement of patient care at first level hospital will reduce unnecessary admission at second level hospitals. Hence only patient with complicated condition can be admitted at second level hospitals surgical wards as per health care standards in second level hospitals.

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