ASSESSMENT OF LEVELS OF QUALITY OF ANTENATAL CARE RECEIVED BY WOMEN WITH HYPERTENSIVE DISORDERS ADMITTED AT MUHIMBILI NATIONAL HOSPITAL

Isaya Erasto Mhando, MD

MMed (Obstetrics and Gynaecology) Dissertation
Muhimbili University of Health and Allied Sciences
October, 2019

Muhimbili University of Health and Allied Sciences

Department of Obstetrics and Gynaecology



ASSESSMENT OF LEVELS OF QUALITY OF ANTENATAL CARE RECEIVED BY WOMEN WITH HYPERTENSIVE DISORDERS ADMITTED AT MUHIMBILI NATIONAL HOSPITAL

By

Isaya Erasto Mhando,

A Dissertation submitted in partial fulfillment of the requirements for the Degree of Masters in Obstetrics and Gynaecology of

Muhimbili University of Health and Allied Sciences
October, 2019

CERTIFICATION

The undersigned certify that they have read and hereby recommend for the acceptance by the Muhimbili University of Health and Allied Sciences a dissertation entitled **"*Assessment of levels of quality of antenatal care received by women with hypertensive disorders admitted at Muhimbili National Hospital"*** in partial fulfillment of the requirements for the degree of Master of Medicine in Obstetric and Gynaecology of Muhimbili University of Health and Allied Sciences.

_____

Dr. Furaha August

(Supervisor)

Date_____

DECLARATION AND COPYRIGHT

I, **Isaya Erasto Mhando** 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_____

This dissertation is a copyright material protected under the Berne Convention, the Copyright Act 1999 and other international and national enactments, in that behalf, on intellectual property. It may not be reproduced by any means, in full or part, except for short extracts in fair dealing, for research or private study, critical scholarly review or discourse with an acknowledgement, without the written permission of the Directorate of Postgraduate Studies, on behalf of both the author and the Muhimbili University of Health and Allied Sciences.

ACKNOWLEDGEMENT

The completion of this work wouldn't be possible for without my supervisor; Dr. Furaha August, I would like to express my appreciation for the spirit of teaching observed both in research as well as in clinical area combined with good guidance in several tasks entailed to accomplish this work.

I also would like to express my sincere gratitude to all members of MUHAS Academic team department of obstetrics and gynaecology for their dedicated constructive ideas and criticism that contributed much in this research work.

I want to extend my sincere thanks to Dr. Kazaura, Dr. Mpembeni Department of Epidemiology and biostatistics for their advice on statistical work.

I thank the almighty GOD for good health and ability to study.

DEDICATION

I dedicate this work to the almighty GOD for good health, peace and ability to work diligently also dedicate it to my lovely mother Tabitha Jonathan, retired Nurse Midwife for inspiring me early in life to opt for this field, lastly to my daughter Rehema Isaiah whom you have missed while accomplishing this task.

ABSTRACT

BACKGROUND: Hypertensive disorders in pregnancy are among the conditions which contribute to the direct causes of maternal mortality. The prevalence of hypertensive disorders ranges between 5-10%, and varies from place to place, it was estimated to be 16% in Tanzania.

OBJECTIVE: the objective of this study was to assess the levels of quality antenatal care received by women with hypertensive disorders admitted at MNH.

METHODOLOGY: Descriptive hospital based cross section study.

Most women, who are admitted at Muhimbili National Hospital, are already in severe forms of hypertensive disorders. The level of quality of antenatal care received is not known. A tool for assessing levels of quality of antenatal care was adopted from a study done in Zambia.

Levels of quality in this study are good quality, adequate and poor quality depending on blood pressure measurement on every visit, screening of urine for protein on every visit and counseling on danger signs.

The study was organized in two forms; quantitative and qualitative studies. We recruited 351 women and 20 women were selected among them for the in depth interview.

For the quantitative study, data was collected using a checklist, case notes, and one questionnaire. A checklist was used to extract information from antenatal cards regarding, number of visits, blood pressure, and screening of urine for protein. Information from case notes was about the diagnosis and blood pressure on the day of admission while a questionnaire used for assessing whether women were counseled for danger signs or not.

For the qualitative component; a questionnaire for open ended questions was used to explore, women's view about how counseling on danger signs, blood pressure and screening of urine for protein were done. The interview was recorded, then transcribed in Swahili and translated into English verbatim in one text context.

Data analysis for the quantitative component was done using SPSS version 23, where descriptive statistics for frequencies and percentage of the variables were obtained. Cross tabulation tables between the number of visits and service provision were obtained.

Data for qualitative component was analyzed by qualitative content analysis.

RESULTS: The proportion of women counseled for danger signs was (264) 75.2%, the proportion of women tested urine for protein on every visit was 89 (25.4%),The mean number of ANC Visit was 3.8visits. The proportional of women checking blood pressure for every visit was 87.5%; women who had below 4 visits were 167 (47.6%), and women with 4 and above visits were184 (52.4%)

The levels of quality antenatal care were good quality37%, Adequate quality26%.poor quality.37%.Three themes which were explored from the qualitative interview are, good counseling practice, there was no feedback during blood pressure and urine test and mothers are eagerly to have shorter intervals for follow up visits.

CONCLUSION: Most women, who are admitted at MNH due to hypertensive related complications, are already in severe forms of hypertensive disorders due to poor quality of care received at antenatal clinics in the line of managing hypertension at that level of care.

TABLE OF CONTENTS

CERTIFICATION i
DECLARATION AND COPYRIGHT ii
ACKNOWLEDGEMENT iii
ABSTRACT v
LIST OF TABLES ix
LIST OF FIGURES ix
LIST OF ABBREVIATIONS x
DEFINITION OF TERMS xi
1.0 INTRODUCTION 1
1.1 BACKGROUND 1
1.2 LITERATURE REVIEW 4
1.3 CONCEPTUAL FRAMEWORK 9
1.4 PROBLEM OF THE STATEMENT 10
1.5 RATIONALE 10
1.6 RESEARCH QUESTION 11
1.7 OBJACTIVES 11
1.7.1 BROAD OBJECTIVE 11
1.7.2 SPECIFIC OBJECTIVES 11
2.0 METHODOLOGY 12
2.1 STUDY DESIGN 12
2.2 STUDY SETTING 12
2.3 STUDY POPULATION 13
2.4 SAMPLE SIZE 13
2.5 SAMPLING TECHNIQUE 13
2.6 DATA COLLECTION 14
2.7 DATA ANALYSIS 14
2.8 ETHICAL CONSIDERATION. 17
3.0 RESULTS 18
4.0 DISCUSSION 23
6.0 CONCLUSION 25
7.0 RECOMMENDATIONS 25
8.0 REFERENCE 26

9.0 APPENDICES 31
9.1 APPENDIX 1 QUESTIONNAIRE: ENGLISH VERSION. 31
9.2 APPENDIX II QUESTIONNAIRE-SWAHILI VERSION 37
9.2 APPENDIX III : CONSENT FORM 43
9.4 APPENDIX IV: CONSENT FORM (SWAHILI VERSION) 44

LIST OF TABLES

Table 1: SOCIAL DEMOGRAPHIC CHARACTERISTICS. 20

Table 2: DISTRIBUTIONS OF WOMEN COUNSELED 21

Table 3: SHOWS THE DISTRIBUTION OF WOMEN CHECKED URINE FOR PROTEIN AND BLOOD PRESSURE ACCORDING TO TREND WITH RESPECT TO NUMBER OF VISITS 21

Table 4: LEVELS OF QUALITY OF CARE 22

LIST OF FIGURES

Figure 1: CONCEPTUAL FRAMEWORK 9

Figure 2: SHOWS THE DISTRIBUTION OF DIAGNOSIS OF THE STUDY PARTICIPANTS. 19

LIST OF ABBREVIATIONS

ACOG	-	American College of Obstetrics and Gynecology
ANC	-	Antenatal clinic
BPACR	-	Birth preparedness and complication readiness
BP	-	Blood pressure
CVA	-	Cerebral Vascular Accident
FANC	-	Focused Antenatal Care
HELLP	-	Hemolysis, Elevated Liver Enzymes and Low platelet count.
IPT	-	Intermittent Preventive Treatment
MNH	-	Muhimbili National Hospital
MOD	-	Mode of Delivery
PIH	-	Pregnant Induced Hypertension
TDHS	-	Tanzania Demographic and Health Survey.
WHO	-	World Health Organization

.

DEFINITION OF TERMS

1) LEVELS OF QUALITY OF ANTENATAL CARE RECEIVED BY WOMEN WITH HYPERTENSIVE DISORDERS.

Is the care received by women with hypertensive disorders during their antenatal clinics. Good quality of care is expected to reduce morbidity/mortality due hypertensive related complications for both the mother and fetus. It is based on number of antenatal visits, trend by which antenatal care was provided and number of interventions offered (i.e. blood pressure, urine for protein, and counseling of danger signs).(1–3)

i. **GOOD QUALITY:** ≥ 4 antenatal visits where 3 interventions are considered in which, blood pressure and urine for protein were done on every visit for all 4 or more visits, counseling on danger signs done once.

ii. **ADEQUATE QUALITY:** < 4 antenatal visits, in which 3 interventions are considered, where blood pressure and urine for protein were done every visit, counseling on danger signs done once

iii. **POOR QUALITY** Any number of antenatal visits with only one intervention or no intervention done.

1.0 INTRODUCTION

1.1 BACKGROUND

Hypertensive disorders in pregnancy are among the direct causes of maternal mortality worldwide(4).The prevalence of hypertensive disorders varies from different places, however it averages between 5-10%(5–7).The burden of morbidity due to hypertension in pregnancy has been shown to prevail. The rate of obstetric complications in delivery admissions with hypertensive disorders was higher compared to hospitals without hypertensive disorders in USA(8). The case specific maternal mortality ratio was 780 per 100000 live birth at Mulago hospital in Uganda(9).Various places across Africa has shown high mortality in association to these disorders(10).

Hypertensive disorders include, eclampsia, severe pre eclampsia, pre eclampsia superimposed on chronic hypertension, gestation hypertension, and chronic hypertension.

The diagnosis is based on elevation of systolic blood pressure of 140mmHg and above with a diastolic blood pressure of 90mmHg and above.(11).

Pre eclampsia is diagnosed when there is elevation of blood pressure of 140/90 or above, with or without proteinuria, in association with thrombocytopenia of less than 100000 at gestation above 20 weeks(12). Gestation hypertension is the elevation of blood pressure of 140/90 or above without proteinuria at 20 weeks or above(13). Eclampsia is the onset of tonic clonic seizures in a pre eclampsia patient; chronic hypertension is diagnosed when there is prevailing hypertension before pregnancy or before 20 weeks gestation.(14).pre eclampsia superimposed on chronic hypertension is the onset of proteinuria on a patient with chronic hypertension.

Despite of high morbidity as well as mortality associated with hypertensive disorders generally; severe pre eclampsia and eclampsia has been associated with higher morbidity and mortality. This has been demonstrated in various clinical setting in USA(8),however it was also demonstrated in Tanzania at muhimbili tertiary teaching hospital and Bugando tertiary hospital respectively(15–17).

This study adopted the Donabedian and Maxwell model of quality of care and WHO standards for improving maternal care(1,2,18).Tanzanian policy regarding achieving quality antenatal care, had earlier adopted focus antenatal care(FANC) from the risk oriented model. Women without complications receive four goal oriented visits, while women with complications are planned to have further individualized care with addition number of visits.

Timing of initiation of antenatal services in Tanzania starts before 16 weeks, second visit at 20-24,3rd visit 28-32 and lastly at 36 week gestation. The content of FANC includes counseling on danger signs, preventive services, screening and treatment of women with underlying conditions, e.g. HIV, Tuberculosis, Diabetes mellitus, general assessment as well as component of birth preparedness, each visit has specific package of care to be provided.

Women with hypertensive disorders are usually diagnosed during their antenatal attendance with the standard that, blood pressure, testing urine for protein are done on every visit as revealed in the Tanzanian checklist guideline for focus antenatal care. Counseling on danger signs is done in a two way traffic through discussion(19).

Women with elevated blood pressure, are assessed for treatment either at the health facility or referred to higher centers based on patient's condition. Pre referral treatments like magnesium sulphate, anti-hypertensive, cannulation and catheterization are usually done at the health facility level.

The process attributes of the quality of care were studied. A tool for the levels of quality of antenatal care was adopted from a study done in Zambia.(20).This means, several attributes of process of care are considered. Therefore in our study we regarded trend of receiving care (whether care was received every visit), number of antenatal visits, and 3 interventions (i.e. blood pressure measurements, testing urine for protein and counseling on danger signs).

Good quality of antenatal care was considered for women who had achieved 4 or more antenatal visits, where blood pressure and urine for protein was checked every visit, counseling for danger signs was done once. Mothers who achieved adequate quality had

less than 4 visits, 3 interventions (blood pressure and urine for protein done at every visit and counseling on danger sign done once).Women received poor quality of antenatal care are those with any number of visits with no or only one intervention which is either among (i.e. blood pressure, urine for protein and counseling on danger signs.)

1.2 LITERATURE REVIEW

The proportion of women counseled on danger signs varies in different places across Africa, counseling on danger signs was assessed in 19 countries in sub-Saharan Africa where 6% in Rwanda, and less than 50% in 15 of the 19 surveyed countries. Malawi was found to have higher proportion of women counseled on danger signs of 72%(21). However the study didn't show how the counseling was done.

Studies done in Burkina Faso, Ghana and Tanzania also showed that, the proportion of women counseled on danger signs were 68.6%,70% and 60.5% respectively(22).

In Tanzania, counseling of danger signs was assessed in Rufiji district in 2010.The proportion of women counseled on danger signs was 58%(23).This study concluded on suboptimal quality in the counseling. The proportion of women with hypertensive disorders counseled was not revealed in this study

.However, despite the facts provided on counseling in several studies, it is yet not clear how counseling on danger signs for women with hypertensive disorders is done enough to prevent women from eclampsia fits and other complication of hypertension.

Screening urine for protein in hypertensive disorders is a diagnostic measure of the disease severity; the more protein detected in urine, the severity the disease(24). When urine for protein of 300mg per 24hours is collected, or protein/creatinine ratio of 3, or +1; by dipstick in the absence of other tests, it signifies severe form of hypertensive disorder(14).Although other studies has demonstrated that the amount of protein in urine doesn't predict maternal and neonatal outcomes; however protein test can be useful and is recommended in low resource countries(25). . The proportion of women identified by not checking urine protein was 41%.This was among substandard care factors in maternal mortality review in Netherlands.(26) the review considered hypertensive disorders alone. However there was no enough information about the proportion of women testing urine on every visit as recommended by WHO focused antenatal care(19),

The proportion of women testing urine for protein on every visit in many parts of sub-Saharan Africa not known, although studies done provide a general figure. A study to assess the quality of clinical practices in the screening of preeclampsia/eclampsia, was

conducted in six countries in sub-Saharan Africa. The proportion of testing urine for protein was estimated to 46% compared to other intervention 68% in checking blood pressure(27).

Most women with hypertensive disorders in pregnancy at saint Francis District hospital, south-East part of Tanzania had eclampsia attributed to substandard care during ANC as only 22% of pregnant women had urine for protein checked(28).Nevertheless, the study didn't show the relationship on number of visits in which urine for protein was tested; WHO standards require women have their urine tested on each visit.

A descriptive cross section study done at Bugando medical centre; a university teaching Hospital in Northern part of Tanzania, to establish the incidence of eclampsia and associated maternal and peri-natal outcome, demonstrated 24.66% of pregnant women screened for urine for protein. Maternal and peri natal case fatality rate were 7.89% and 20.73% respectively. Main factors contributed to maternal death were acute renal failure, HELLP syndrome, pulmonary edema and DIC. Low proportion of mothers screened for proteinuria as a diagnostic tool, indicates the possibility of most women went on undiagnosed to severe disease. (17).

Regarding the number of visits, Most women in Sub-Saharan Africa initiate late antenatal visits, therefore they miss opportunities for quality ANC care(29). Randomized trials comparing a reduced number of visits with or without goal oriented care versus standard care conducted in Argentina, Cuba, Saud Arabia and Zimbabwe demonstrated a High maternal mortality rate in women with reduced number of ANC visits in the low and middle resource countries(30).This study did not reveal the content of care coupled with number of visits. It was mentioned, 73.6% booked in second trimester, the study did not mention, the proportion of women with 4 or more antenatal visits.

The quality of ANC among women who had completed 4+ antenatal visits was assessed in 19 countries by focusing the content of antenatal care looking each individual component, regarding screening hypertensive disorders in pregnancy; Colombia achieved 100%, generally. Most Asian countries achieved high quality of care compared to sub-Saharan Africa(31)(32). Studies which support the 4+ didn't support the four visits in terms of contents, but on the other hand it was shown that, women who had 4 or more antenatal

visits were able to achieve most components of antenatal care with reduced perinatal and maternal mortality.(20,33,34), However, the proportion of women with 4 or more visits was not revealed in these studies.

Good quality antenatal care was considered by; women achieving 4 ANC visits, completion of seven process attributes of care inclusive of blood pressure, urine protein, and early attendance by women during the first trimester. The proportion of women achieved 4 visits was 50%,the proportion of women with good quality ANC care was 24.3%(35). There was no information about the proportion of women who received care on every visit.

Regarding number of antenatal visits, Tanzania adopted WHO focused antenatal care in which all pregnant women have to attend 4 antenatal visits. Women with hypertensive disorders and other complications, are scheduled for follow up visits with individualized care(19).WHO recommendation on ANC for positive pregnant experience insists on 8 visits, however this hasn't been yet adopted in Tanzania, and therefore, the health policy still considers 4 visits. The underlying principle with focused antenatal care is to consider all pregnant women at high risk.

The proportion of women completed 4 visit in Tanzania is 51%(36).TDHS 2015-16,revealed,60% had urine sample collected during ANC,71% had their blood pressure measured. The lacking information is the proportion of women with 4 visits in which all content of focused ANC was accomplished in each visit.

The impact of blood pressure measurement was highlighted in the 2006-2008 UK, confidential enquiries in maternal death report, which found that, "the most common reason for substandard care in death due to pre eclampsia/eclampsia was failure to recognize and treat hypertension"(37)

Blood pressure monitoring has also impact on the size of offspring at delivery, there is evidence that, "for every increase in 1standard deviation of systolic and diastolic blood pressure at gestation age 30(28.4-32.9) weeks is associated with 16.9gm and 50.6gm lower birth weight respectively"(38).Regular monitoring of blood pressure during antenatal is important.

A cross sectional study done in Nigeria to assess the content of antenatal care, it was revealed that,100% of all women attended, had blood pressure measurement compared with 43% who had urine checked for protein at least once(34).The study was concluded to have a reasonable capacity for prevention of hypertensive disorders. The proportion of women who received all these services on every visit was not revealed as it is insisted in WHO recommendations(12).

Blood pressure measurement as described in the Tanzanian guideline on the focus antenatal care, has to be checked on every visit.(19).The proportion of women who had blood pressure checkups was 71% TDHS2015/2016(36). However it is not clear whether blood pressure was checked on every visit.

Women's views on the low number of antenatal visits in Pakistan, was lack of knowledge about when to initiate antenatal services, how many visits, and the availability of certain laboratory tests at facility(39).The study didn't show the prevailing situation at facility, about how provision of services was done.

A qualitative study regarding women's view for late booking in Yorkshire in U.K revealed three themes of, "not knowing", professional and system failure issues "knowing"; where and some women would prefer to attempt self care(40).This study did reveal the relationship of women's view with respect to standards of antenatal care as per WHO.

Challenges on the provision of evidence based antenatal care in Mozambique, were explored at two levels, ministry of health and health facilities. At ministry level, they admitted that, lack of human resource was coupled with poor antenatal care. At facility levels, the challenges were lack of blood pressure equipments. Therefore, many women were not checking blood pressure for long duration(41).However, the study failed to show how consistently blood pressure checked for facilities which managed to have equipment.

A cross section study to determine the quality of antenatal care by employing both qualitative and quantitative methods about various components of antenatal care, there were less than 50% of women who were satisfied about how information was being given during antenatal care, the care received was influenced by the number of antenatal visits(42,43).

However the study didn't reveal how women were satisfied when receiving other attributes of the process of care like blood pressure, checking urine for protein.

A study done in Ghana, Kenya and Malawi to determine women's views on the factors affecting ANC attendance revealed the limited information, and interactions with health care providers on the meaning of some of procedures done(44).

Qualitative exploration on the provision of quality antenatal care clinics in kilombero valley, southern part of Tanzania, it was evident that, most of antenatal guidelines were not followed, supply for urine tests were inadequacy. Most women who were admitted, received poor quality of care due to shortage of staff(45).

1.3 CONCEPTUAL FRAMEWORK

The quality of antenatal care is dependent of three major components; the structure, process and outcomes, the structural component is health system, health workers, facilities supplies and other components that support the provision of health services.

While the process is based on the provision and experience of care, provision of care should be evidence based for routine practice and management of complications as well as emotion support, especially during counseling for danger signs. This study considers the process and experience of care.

The following diagram illustrates on how these process attributes of care are interrelated. Conceptual framework was adopted and modified from WHO standards for improving maternal and new born care in health facilities 2016.

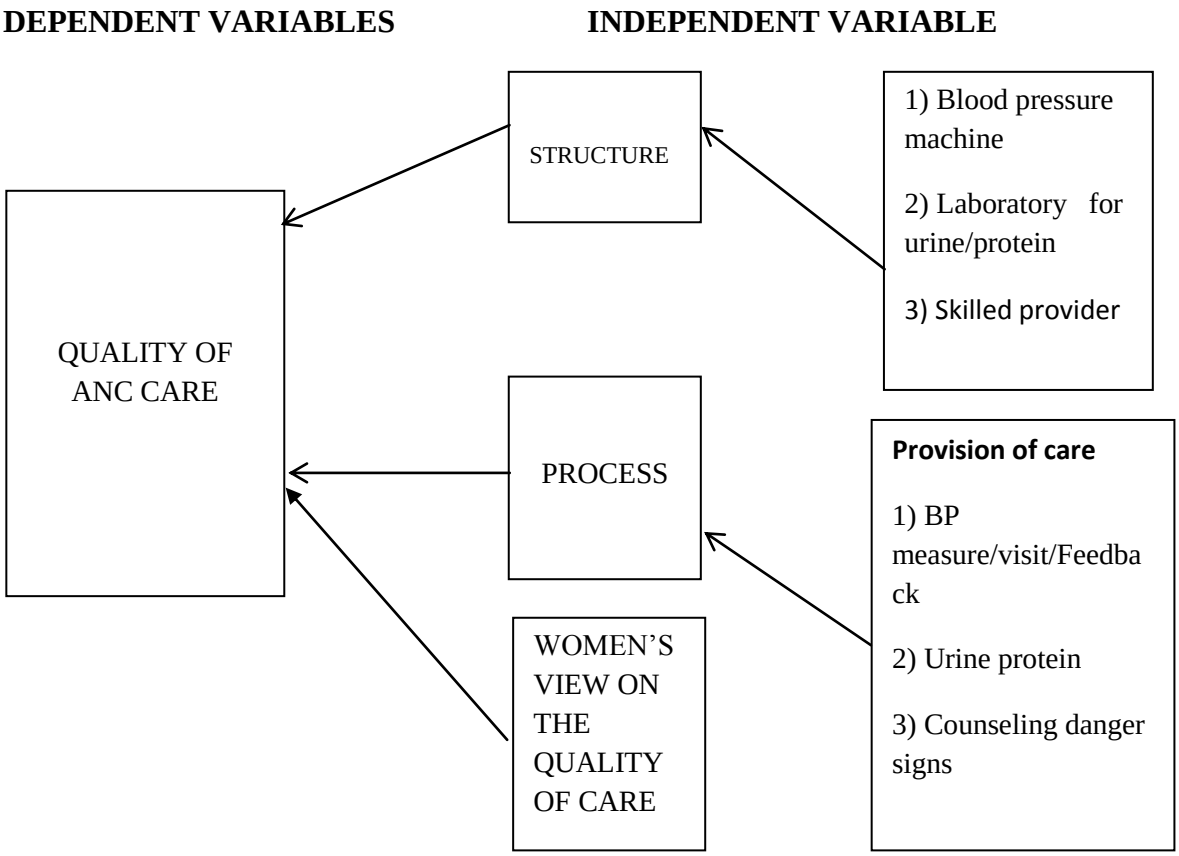


Figure 1: CONCEPTUAL FRAMEWORK

1.4 PROBLEM OF THE STATEMENT

Despite of High quality of care offered to women with Hypertensive Disorders, at MNH, there are still more women who are admitted already developed complications, that significantly demand resources for care as well as long hospital stay(46) whilst the levels of quality ANC care offered to these women is unknown.

The magnitude of Hypertensive Disorders of women referred to Muhimbili National Hospital is still high 16%, Eclampsia 3%. Hypertensive disorders still has a large contribution to maternal mortality as a direct cause. Substandard care factors during Antenatal care has been linked to the incidence of Eclampsia in other Areas in Tanzania, but there is no adequate information regarding the levels of quality antenatal care received by women in Dar as salaam referred to Muhimbili National Hospital due to hypertensive related complications.

The quality of antenatal care specifically for women with hypertensive disorders in pregnancy has not been studies much in Tanzania. It is 13 years since the last study done in Tanzania specifically for hypertensive disorders in pregnancy in Rufiji coast region, Urasa et al investigated the management of hypertension in pregnancy as a quality indicator for antenatal care; the study demonstrated, the low efficiency of the ANC in the prevention and management of eclampsia and hypertensive disorders.

1.5 RATIONALE

The finding of this study will add knowledge on the proportion of women who received good quality of antenatal care and those who had poor quality, this may help understand what is lacking in various antenatal clinics, therefore training on proper counseling women on danger signs, advocating for supply: laboratory equipments for checking urine for protein, Blood pressure machines so that women will have opportunity for checking their blood pressure on every visit.

1.6 RESEARCH QUESTION

What are the levels of quality of antenatal care received by women with hypertensive disorders in pregnancy?

1.7 OBJACTIVES

1.7.1 BROAD OBJECTIVE

To assess levels of quality of antenatal care received by women with hypertensive disorders at Muhimbili national hospital

1.7.2 SPECIFIC OBJECTIVES

1) To determine the proportional of mothers counseled for danger signs.
2) To determine the proportional of mothers with hypertensive disorders who checked urine for protein on every visit.
3) To determine the proportion of mothers with 4 ANC visits and above.
4) To determine the proportion of mothers with hypertensive disorders who had blood pressure measurement on every visit.
5) To explore client views regarding the care received.

2.0 METHODOLOGY

2.1 STUDY DESIGN

This is a cross section Hospital based descriptive study which comprised of two components; the quantitative and qualitative component. The qualitative part done to supplement the quantitative part.

2.2 STUDY SETTING

The study was conducted at muhimbili national hospital situated in Dar es salaam. Muhimbili national hospital is one of the largest referral and university teaching hospitals in the country, it is among the four referral centers in Tanzania; receiving referral cases from various places across the country, obstetrics and gynecology is among the department at Muhimbili National Hospital.

The department of obstetrics and gynaecology is comprised of maternity block and gynaecolgy block. The maternity block is comprised of the labor ward, antenatal and postnatal wards. The maternity block is situated close to an operating theatre that serves for both emergency and elective procedures. The total number of deliveries during the study period (from1st November 2017 to 31stJanuary 2018) was2567.The total admissions in the ward were 2959.

Management protocol of hypertensive disorder in pregnancy at MNH is done according to disease severity, for patients whose diastolic blood pressure is less than 110 are managed at outpatient antenatal clinic or admitted in the ward based on obstetrician's judgment. Critically ill patients with hypertensive related complications are admitted at intensive care unit and are managed according to the Hospital set standards of care(47)**.**

The process attributes of antenatal care of women who were referred from various health facilities in Dar es Salaam were studied. We used antenatal card to assess what components of antenatal care were done consistently according to standards of focused antenatal care in Tanzania.

Since the proportion of the levels of quality antenatal care is not available as there is no previous study done at this setting, this study used 29% for quality of care received by women from a study done in Zambia which considered levels of quality of care(20).

2.3 STUDY POPULATION

All women admitted at MNH; maternity block from 1st November 2017 to 31st January 2018

2.4 SAMPLE SIZE

The sample size is calculated from the formula below:

$$\frac{N = Z2P(100 - P)}{\varepsilon 2}$$

Where n= minimum required sample size.

Z= z score on the normal distribution curve,

Corresponding to 1.96 for 95% confidence level

P = proportion of women received quality of care = 29%

ε=margin of error which is 5% (for the 95% confidence interval)

Therefore N= $1.96^2 \times \frac{29(100-29)}{5^2}$

= 316

Considering non respondent = $N \times$ Adjusted factor

$$316 \times \frac{100}{100 - 10}$$

= 351

INCLUSION CRITERIA

All post delivery mothers who had delivered at 28weeks and above and were admitted due to hypertensive disorders, included in the study. Most women had been referred from different health facilities for various reasons.

EXCLUSION CRITERIA. Unconscious women and those who were unable to communicate were excluded.

2.5 SAMPLING TECHNIQUE.

Convenient sampling procedure was used depending on the available cases with hypertensive disorders. All women with hypertensive disorders were recruited from 1st November 2017 to 31st January 2018. Each of the admitting wards and the intensive care unit had one research assistant who made notification of newly admitted post-delivery patients diagnosed with hypertensive disorders.

2.6 DATA COLLECTION

During the study period, all women with hypertensive disorders who are already delivered were asked to participate in the study on voluntary after filling the consent form and understanding and arrived to an informed decision. Quantitative data collection was done by the principle investigator, using a checklist to obtain information from the antenatal cards regarding number of antenatal visits, screening of urine for protein, blood pressure measurements with respect to number of ANC visits. Case notes were also used to obtain information on the diagnosis, blood pressure measurement at MNH. One questionnaire was used for obtaining information about the counseling of danger signs. Mothers were asked using probing questions to give evidence on whether they received counseling in the index pregnancy or the previous pregnancies and whether counseling was not done. Mothers with eclampsia, were identified and followed up until complete recovery when they were able to explain.

Qualitative data was done using a questionnaire with open ended questions to explore women's view on how the process attributes of care were being done during the antenatal period. The questionnaire adopted from tools of qualitative methods in public health(48). A prior exploration of how blood pressure, testing urine for protein, counseling on danger signs and how follow up visits were being scheduled was done. The saturation point reached when the 20 women were almost giving similar information. In-depth interview was done on these women who are among the recruited 351 of the sample. The spoken voice was recorded, and transcribed in Swahili verbatim then translated in English text

2.7 DATA ANALYSIS

The quantitative data was entered, cleaned and coded then analyzed by SPSS version 23.

Quantitative data was analyzed using descriptive statistics. Social demographic characteristics were described using frequency distribution and percentage. Cross tabulation tables on the number of visits was done against the process attribute of care, e.g. blood pressure, urine for protein measurements on every visit, not done at all or whether was done but not every visit, for <4 visits, and ≥ 4visits.counseling on danger signs was accepted to be done once, for both women with <4 or ≥4 visits.

The levels of quality of care defined as good, adequate and poor quality were obtained by scoring women based on the number of visits, the trend of receiving care, and the number

of interventions done (blood pressure measurement, testing urine for protein, and counseling on danger signs).

Good quality were scored for women achieved 4 or more antenatal visits in which blood pressure and urine for protein were done on every visit, counseling on danger signs done once(No of visits 4 and above, Trend=every visit,3 interventions= blood pressure, urine for protein and counseling of danger signs).

Adequate quality: women who achieved < 4 visits, in which, blood pressure and urine for protein done on every visit, counseling on danger signs done once,(No of visits < 3, Trend of care=every visit, no of interventions=3)

Poor quality was done. Women with any number of visits in whom, there is only one intervention among blood pressure, urine for protein, and counseling of danger signs,

Qualitative analysis was done using content analysis in nursing research(49) where after transcription and translation of the recorded interview into a text context, sentences (constellation of sentences) with the same meaning were grouped together to form meaning unit, then condensed meaning units, followed by coding, then similar codes were grouped to form groups which were mutually exclusive (i.e. Groups which are internally homogeneous but externally heterogeneous) followed by formation of different themes as the final step. Table i). Below shows how the analysis was done.

Table i) QUALITATIVE CONTENT ANALYSIS OF THE WRITTEN TEXT

THEMES	**Good counseling practice**	**No feedback after Bp measurement and protein test**	**Poor prioritization of high risk women for follow up visits.**
CATEGORIES	Discussion	Lack of knowledge of BP measurement or protein test	Poor monitoring of high risky women
CODES	Interactive communication	No elaboration after examination or test.	Long period out of antenatal care
CONDENSED MEANING UNIT	Given facts and asked questions for understanding	Was not informed of my problem after examination or test	I had long interval from the previous to next visit
MEANING UNIT	1) The conversation with my doctor was more of a discussion, as we were planning," let's do this or that", no commanding. 2) Gave me advice listen to my concern the way I wished to 3)we were taught and asked, "is there anyone with a question?" 3) I liked all the services as they exhibited a sense of caring and considerate	2) Were not told of our BP at the Antenatal clinic, but with the doctor yes! But he doesn't put much emphasize regarding the dangers of my high Bp I am suffering. 3) Have been checking blood pressure, testing protein in urine but never told of my condition. 4) I was always being told of my blood pressure raising but never instructed of what to do and I could just see from the antenatal card as175/135. 5) I was not impressed by the way they used to check blood pressure and jot down the readings on my card, I wasn't told of anything 6) I was not impressed by the way they used to check blood and jot down the readings on my card, I wasn't told of anything 7) :I don't know what they tested I think it might be sugar or UTI	1) It is because, I started late at 5 month, and when you go now they will assign you to a long interval date. 2) Persistently counseling them on the importance of attending to clinics when they face problem despite of their remote assigned date of attendance! 3) I started my clinic at 4^{th} and half age of my pregnancy, it was in may but I was instructed for the second visit in October the 14^{th},my opinion for this, is they shouldn't assign me to such a long interval besides the fact that I had told them about my problem, I expected a monthly attendance to the clinic because of my past miscarriages, this is the reason why I had only one visit.

2.8 ETHICAL CONSIDERATION.

The ethical clearance for the study was obtained from the Senate Research and Publication Committee for Muhimbili University of Health and Allied Sciences (MUHAS).

Permission to conduct the study was obtained from the head of department obstetrics and gynaecology at Muhimbili National hospital. Written informed consent obtained from participants after being informed about the purpose of the study.

Participant's information regarding interviews and recording of the spoken voice was kept confidential and will be destroyed at the end of this study. Freedom to withdraw from the study at any time was allowed and that wouldn't affect their care and treatment.

3.0 RESULTS

The study recruited 351 post-delivery mothers who were admitted due to hypertensive related complications, where 322(91.7%) were from Dar es Salaam, 29(8.3%) were from other regions outside Dar es Salaam.

Table 1 shows, social demographic factors.

Table 2 shows, the proportion of mothers counseled on danger signs,

Table3 shows, the distribution of mothers, checked urine-protein and blood pressure according to trend with respect to the number of antenatal visits.

Table 4. Shows, a composite score for the levels of quality antenatal care received by women with hypertensive disorders.

The proportion of mothers counseled on danger signs was 75.3%. Women's view on counseling on danger signs, explored a theme for good counseling practice.

"The conversation with my doctor was more of a discussion, as we were planning," let's do this or that", no commanding"

The proportion of mothers tested urine for protein on every visit was 25.4%. Women's view on urine test explored a theme for lack of feedback on the test.

"I have been testing protein in Urine, but, I was never told of my condition"

The proportion of women achieved 4 visits and above was 52.4%. Poor prioritization of high risk women for follow up visits was a theme explored on the number of visits.

"I started my clinic at 4th and half age of my pregnancy, it was in may but I was instructed for the second visit in October the 14th, my opinion for this, is they shouldn't assign me to such a long interval besides the fact that I had told them about my problem,

I expected a monthly attendance to the clinic because of my past miscarriages; this is the reason why I had only one visit."(One among the clients).

The proportion of mothers who were checking blood pressure on every visit was 87.5%, however according to the theme explored on blood pressure measurement, they were not being given feedback.

"*I was always being told of my blood pressure raising but never instructed of what to do and I could just see from the antenatal card as175/135"(*from one of among participants and several other).

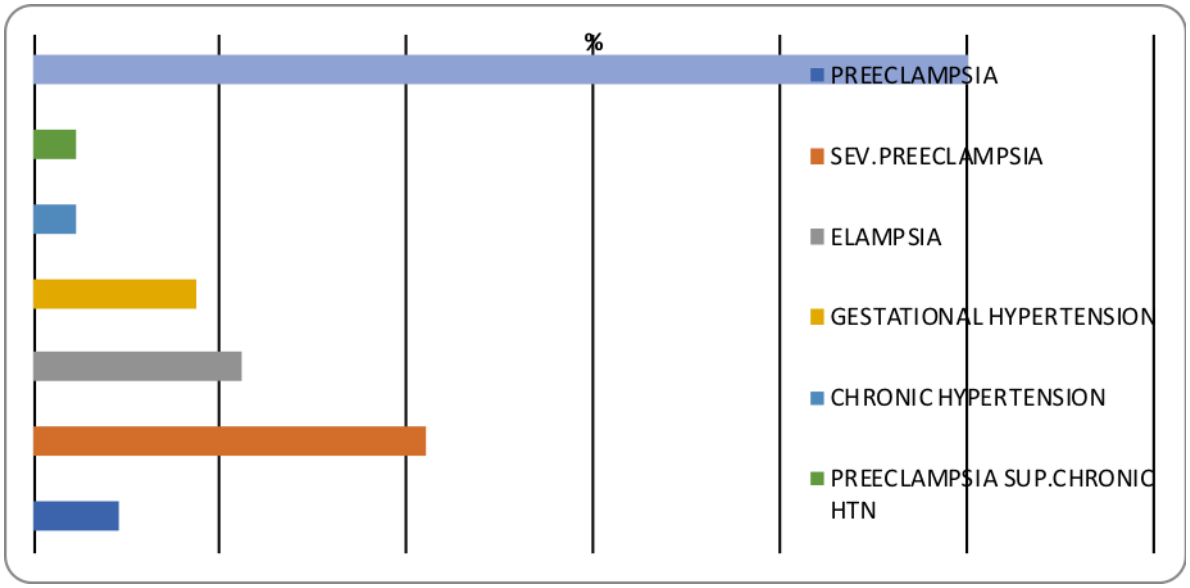


Figure 2: SHOWS THE DISTRIBUTION OF DIAGNOSIS OF THE STUDY PARTICIPANTS.

Severe pre-eclampsia and eclampsia contributed 40% and 20% of all diagnosis of hypertensive disorders. Among 78 eclampsia mothers, 53(68%) fitted at home, 17(21.8%) fitted at health facility, and 8(10.3%), fitted at MNH.

Table 1: SOCIAL DEMOGRAPHIC CHARACTERISTICS.

Variable	Frequency N=351	%
AGE		
15-25	123	35
26-36	176	50.1
37-48	52	14.8
MARITAL STATUS		
Married	306	87.2
Not married	45	12.8
EDUCATION		
No formal Education	18	5.1
Primary school	186	53.0
Secondary school	124	35.3
University	23	6.6
OCCUPATION		
Employed	39	11.1
Small business	159	45.3
Unemployed	153	43.6
PLACE OF RESIDENCE		
Dar es salaam	322	91.7
Outside Dar	29	8.3
GA Booking		
0-12	63	17.9
13-24	263	74.9
25-36	23	6.6
37-44	2	0.6
Anc-Visits		
< 4 Visits	167	47.6
4 and > visits	184	52.4
GA at delivery		
28-31	65	18.5
32-35	113	32.2
36-40	153	43.6
41-44	20	5.7
Obstetric characteristics		
Parity		
1	136	38.7
2-3	144	41.0
4-5	60	17.1
6-8	11	3.1
No , children		
0	16	4.6
1-2	224	63.8
3-4	88	25.1
5-6	23	6.6
MOD		
SVD	191	54.4
C/S	160	45.6

Most participants; 91.7% were from Dar es salaam, aged 26-36years,50.1%, and 87.2% of all were married with over 50% completed primary school

Table 2: DISTRIBUTIONS OF WOMEN COUNSELED

COUNSELING ON DANGER SIGNS

	YES		NO			
	FREQUENCY	**%**	**FREQUENCY**	**%**	**FREQUENCY**	**%**
NUMBER OF VISITS						
<4 VISITS	115	32.8	52	14.8	167	47.6
≥ 4 VISITS	149	42.5	35	10	184	52.4
TOTAL	264	75.3	87	24.7	351	100%

The proportion of women counseled on danger signs is 75.3

Table 3: SHOWS THE DISTRIBUTION OF WOMEN CHECKED URINE FOR PROTEIN AND BLOOD PRESSURE ACCORDING TO TREND WITH RESPECT TO NUMBER OF VISITS

PROCESS ATTRIBUTES OF CARE		NOT CHECKED AT ALL		CHECKED BUT NOT EVERY VISIT		CHECKED EVERY VISIT		TOTAL
	TOTAL VISITS REACHED	FREQUENCY	%	FREQUENCY	%	FREQUENCY	%	
1) URINE PROTEIN								
	< 4	89	(25.4)	49	(14.0)	29	(8.3)	167(47.6%)
	>4	59	(16.8)	65	(18.5)	60	(17.1)	184(52.4%)
TOTAL		148	(42.2)	114	(32.5)	89	(25.4)	351(100)
2) BLOOD PRESSURE								
	<4	3	(0.9)	37	(10.5)	127	(36.2)	167(47.6%)
	≥4	0	(0)	4	(1.1)	180	(51.3)	184(52.4)
TOTAL		3	(0.9)	41	(11.6)	307	(87.5)	351(100)

The proportion of mothers checked urine for protein on every visit is 89(25.4%), Women with 4 ≥ visits are 184(52.4%), checked blood pressure on every visit are 307(87.5%)

From table 2 and 3 above, a composite score showing levels of quality of care was made, based on "WHO standards for improving quality of maternal and newborn care"; ranking of quality measure.(page 13).The scoring was recommended by a statistician at Muhimbili university.

Table 4: LEVELS OF QUALITY OF CARE

Process	Trends	Minimum accepted visits	interventions	Proportion achieved	Average score	Level of quality
Counseled	once	≥ 4	3	42.5%	37%	Good quality
Urine-protein	Every visit	≥4		17.1%		
BP	Every visit	≥4		51.3%		
Counseled	once	< 4	3	32.8%	26%	Adequate Quality.
Urine-protein	Every visit	<4		8.3%		
BP	Every visit	<4		36.2%		
Any one among the 3	Done once	Any visit	1	37%	37%	Poor quality

From table 4, Levels of quality of care, Good quality was 37%, adequate quality was 26% and poor quality was 37%.

4.0 DISCUSSION

In this study, the levels of quality of antenatal care received by women with hypertensive disorders was; 37%, 26% and 37% for good, adequate and poor quality respectively. Although there is a good coverage in terms of counseling on danger sign, checking blood pressure on every visit, there are a very low proportion of women who screen urine for protein on every visit. Tanzanian policy for focused antenatal care addresses women to receive care for every visit(19).The low level of care revealed in this study, indicates that, a large proportion of women do not receive care according to stipulated focused antenatal care. A similar study done in Nepal revealed 24% of women had good quality of care(35). Nicholas kyei in Zambia, identified a low level of quality antenatal care, as only 29% of women had good quality(20).

Counseling on danger signs was done to most of women. This is Similar to a study done in Malawi where almost 75% of women were counseled on danger signs(22). Women's view explored good counseling practice. However, among 78 women with eclampsia, 68% had eclampsia fit at home.

Studies done in sub-Saharan Africa and in Tanzania, have demonstrated that, most women don't get the clear message to enable them access health care early.(21,33,50). Among the complications with hypertensive disorders, eclampsia has been linked with high morbidity, maternal mortality and peri-natal mortality(9,17).Although there was a good coverage to counseling on danger signs, there is still a gap for which, women are needed to be counseled in a way they understand danger signs as a way of preventing complications.

The proportion of women who check urine for protein on every visit is 25.4**%,** this is low. Urine test doesn't predict maternal outcome(14),however the efficiency of it as a diagnostic test cannot be obscured in low resource setting. Similar results are also shown in other studies done in Brazil and Ethiopia(51,52).This study has demonstrated that, most women don't understand the significance of the test. There is no feedback regarding the importance of the test. Urine for protein as recommended in focused antenatal care is a test that is usually, done on every visit.(45).There is only 25% of women who test urine for protein on every visit. Therefore, this may adversely hinder screening of pre eclampsia at antenatal level.

According the TDHS 2016,it was shown that, there was 60% of women who tested urine(36), but it is not stated clearly whether the test is done on every visit. In our study we

could observe the knowledge gap on the relationship of testing urine sample and the elevation of blood pressure. Urine test on every visit is a screen targeted for every woman who might be potentially at severe forms of hypertensive disorders(8,51,53).

Regarding the proportion of women achieved 4 antenatal visits, as recommended in focused antenatal care for the Tanzanian setting; this study has demonstrated that, most women with more antenatal visits had more chance to receive care. Most women who had 4 visits and above attained good quality of care, 37% compared to 26%for those had adequate care with number of visits < 4.

The proportion of women attended 4 visits and above in Tanzania is 51%. The proportion of women attended 4 visits and above in this study is 52.4%.It might seem a good coverage when compared to the TDHS proportion of 51%, however there is evidence that, more contact is needed between the health care provider and the client. WHO recommendation of antenatal care encourages 8 visits(54).Most women addressed on the interval between visits to long compared to the anticipated complications, some would prefer a monthly interval. Other studies done in Sweden and other European countries encourage more visits, for example, the average number of antenatal visits in Sweden is 12(55)(56).

Regarding the proportion of mothers checking blood pressure on every visit, this study found a good coverage. There were 87.5% of all women. According to Tanzania demographic survey 2015/16, there was 71% of women reported to have checked blood pressure, not stated whether on every visit. Similar results are also seen in a study done in Nigeria, where most women had blood pressure checkup and concluded to be adequate for preventing eclampsia.(34).

Blood pressure monitoring is very important during pregnancy. NICE guideline for management of hypertension, recommend initiation of treatment with a systolic blood pressure of 150mmhg(24).It has been evidenced from several studies that, neurological conditions due to eclampsia were detected with systolic blood pressure of 170mmHg.In this study, we found that, almost 60% of all women had blood pressure ≥ 160/110 mmhg.

Despite the high coverage of blood pressure measurement, most women are not given feedback. It was evidenced by majority of women engaged in the qualitative interview. The blood pressure checkups remain a routine practice where health care providers usually jot down the recordings on the antenatal card without informing women. Most women were not satisfied with how blood pressure was done without giving feedback.

5.0 LIMITATION OF THE STUDY

The study limitation was failure to assess the structural component of quality of care, especially exploring reasons as to why feedback to most women regarding their health was not being offered; further qualitative study can be done to explore health care provider opinions on the challenges surrounding provision of good quality of care services.

The study didn't account for the delay in several referrals made to MNH, although this wasn't the scope of this study but there are some contribution that are done with the quality based on structure for which it wasn't the scope for this study.

6.0 CONCLUSION

We conclude that, most women who are admitted at MNH due to hypertensive

Related complications are already in severe forms of hypertensive disorder due to poor quality of care received at the antenatal clinics in the line of managing hypertension at that level of care.

7.0 RECOMMENDATIONS

1) There is a need to modify on how counseling is given to mothers, it should be individualized so that mothers are able to understand and access care before complications.(there is a need to educate them based on disease specific conditions, rather than teaching them on danger signs as a general rule).
2) There is a need to evaluate why most clients never receive care on regular basis, qualitative interview with supervision on health care providers is required to identify area of weakness at antenatal level.
3) Feedback regarding blood pressure levels and testing urine for protein should be always be given to all pregnant mothers.

8.0 REFERENCE

1. Maxwell RJ. Dimensions of quality revisited: from thought to action. *Qual Heal Care.* 1992;1:171–7.
2. Brook RH, McGlynn EA, Shekelle PG. Defining and measuring quality of care: A perspective from US researchers. *Int J Qual Heal Care.* 2000;12(4):281–95.
3. Tunçalp Ö, Were W, MacLennan C, Oladapo O, Gülmezoglu A, Bahl R, et al. Quality of care for pregnant women and newborns-the WHO vision. ***B****JOG An Int J* 2015;122(8):1045–9.
4. Khan KS, Wojdyla D, Say L, Gulmezoglu AM, Van Look PF. WHO analysis of causes of maternal death: a systematic review. Lancet. 2006;367(9516):1066–74.
5. Berhe AK, Kassa GM, Fekadu GA, Muche AA. Prevalence of hypertensive disorders of pregnancy in Ethiopia: A systemic review and meta-analysis. *BMC Pregnancy Childbirth.* 2018;18(1):1–11.
6. Hutcheon JA, Lisonkova S, Joseph KS. Epidemiology of pre-eclampsia and the other hypertensive disorders of pregnancy. *Best Pract Res Clin Obstet Gynaecol*. 2011;25(4):391–403.
7. Hutcheon JA, Lisonkova S, Joseph KS. Epidemiology of pre-eclampsia and the other hypertensive disorders of pregnancy. *Best Pract Res Clin Obstet Gynaecol* 2018;25(4):391–403.
8. Kuklina E V, Ayala C, Callaghan WM. Hypertensive Disorders and Severe Obstetric Morbidity in the United States. *Obs Gynecol.* 2009;113:1299–306.
9. Nakimuli A, Nakubulwa S, Kakaire O, Osinde MO, Mbalinda SN, Kakande N, et al. The burden of maternal morbidity and mortality attributable to hypertensive disorders in pregnancy: A prospective cohort study from Uganda. *BMC Pregnancy Childbirth* 2016;16(1):1–8.
10. Yego F, D'Este C, Byles J, Williams JS, Nyongesa P. Risk factors for maternal mortality in a Tertiary Hospital in Kenya: a case control study. *BMC Pregnancy Childbirth* 2014;14(1):38.
11. Centre NC. Hypertension in pregnancy The management of hypertensive disorders. RCOG 2010;(April). NO 107.
12. WHO. WHO recommendations for prevention and treatment of pre-eclampsia and eclampsia 2011. 38 p.

13. Sa L, Bowyer L, Lust K, Lp M, Ra N, Jm PMS. The SOMANZ Guideline for the Management of Hypertensive Disorders of Pregnancy. SOMANZ Guidel. 2014;
14. Roberts JM, Druzin M, August P a, Gaiser RR, Bakris G, Granger JP, et al. ACOG Guidelines: Hypertension in pregnancy. American College of Obstetricians and Gynecologists. 2012. 1-100 p.
15. Pembe AB, Paulo C, D'mello BS, van Roosmalen J. Maternal mortality at muhimbili national hospital in Dar-es-Salaam, Tanzania in the year 2011. *BMC Pregnancy Childbirth.* 2014;14(1):320.
16. Urassa DP, Carlstedt A, Nystrom L, Massawe SN, Lindmark G. *Acta Obs Gynecol Scand.* 2006 Jan;85(5):571–8.
17. Ndaboine EM. Maternal and perinatal outcomes among eclamptic patients admitted to Bugando Medical Centre, Mwanza, Tanzania. *Afr J Reprod Health*. 2012;16(1):35–41.
18. World Health Organization. Standards for improving quality of maternal and newborn care in health facilities. Who. 2016;ISBN 978 9:73.
19. Kearns Annie, Hurst Taylor, Caglia Jacquelyn LA. Focused antenatal care in Tanzania. *women Heal Initiat* 2014;1–13.
20. Kyei NNA, Chansa C, Gabrysch S. Quality of antenatal care in Zambia: A national assessment. *BMC Pregnancy Childbirth*. 2012;12:151.
21. Nikiema B, Beninguisse G, Haggerty JL. Providing information on pregnancy complications during antenatal visits: unmet educational needs in sub-Saharan Africa. *Health Policy Plan*. 2009 1;24(5):367–76.
22. Williams J, Mpembeni R, Duysburgh E, Ye M, Williams A, Massawe S, et al. Counselling on and women ' s awareness of pregnancy danger signs in selected rural health facilities in Burkina Faso , Ghana and Tanzania. *Trop Med Int Heal.* 2013;18(12):1498–509.
23. Pembe AB, Urassa DP, Carlstedt A, Lindmark GE. Quality of antenatal care in rural Tanzania: counselling on pregnancy danger signs. *BMC Pregnancy Childbirth.* 2010;10(35):1–7.
24. Royal College of Obstetricians and Gynaecologists. Development of the guideline. In: NICE clinical guidelines: Hypertension in Pregnancy. 2011. p. 38–46.

25. Prevention and treatment of pre-eclampsia and eclampsia SUMMARY OF RECOMMENDATIONS. 2017 Feb 3
26. Committee MM. Substandard care in maternal mortality due to hypertensive disease in pregnancy in the Netherlands. *BJOG*;2008:115;732-736.
27. Rawlins B, Plotkin M, Rakotovao JP, Getachew A, Vaz M, Ricca J, et al. Screening and management of pre- eclampsia and eclampsia in antenatal and labor and delivery services :.*BMC pregnancy and child birth* 2018;1–11.
28. Nyamtema AS, Bartsch-de Jong A, Urassa DP, Hagen JP, van Roosmalen J. The quality of antenatal care in rural Tanzania: what is behind the number of visits? *BMC Pregnancy Childbirth.* 2012;12:70.
29. Ndidi EP, Oseremen IG, Ebeigbe PN. Reasons given by pregnant women for late initiation of antenatal care in the Niger Delta, Nigeria. *Ghana Med J.* 2010;44(2):47–51.
30. Dowswell T, Carroli G, Duley L, Gates S, Am G, Piaggio G. Alternative versus standard packages of antenatal care for low-risk pregnancy . 2015.
31. Waller A, Bryant J, Cameron E, Galal M, Quay J, Sanson-fisher R. Women ' s perceptions of antenatal care : are we following guideline recommended care ? *BMC Pregnancy Childbirth*. 2016;16(191):1–10.
32. Hodgins S, Agostino D. The quality – coverage gap in antenatal care : toward better measurement of effective coverage. *Glob Heal Sci*. 2014;2(2):173–81.
33. Urassa DP, Pembe AB, Mganga F. Birth preparedness and complication readiness among women in Mpwapwa district, Tanzania. *Tanzan J Health Res.* 2012;14(1):1–7.
34. osungbade, k., oginni , s and olumide A. Content of antenatal care services in secondary health care facilities in Nigeria: implication for quality of maternal health care. *Int J Qual Heal Care*. 2008;20(5):346–51.
35. Joshi C, Torvaldsen S, Hodgson R, Hayen A. Factors associated with the use and quality of antenatal care in Nepal : a population-based study using the demographic and health survey data. *BMC pregnancy and child birth*2014;14(94):1–11.
36. MoHCDGEC, (MoH) [Zanzibar], USAID, NBS, UNICEF, UNFPA G affairs C. Tanzania Demographic and Health Survey and Malaria Indicator Survey 2015 - 16. Dar Es Salaam;

37. Nathan HL, Duhig K, Hezelgrave NL, Chappell LC, Shennan AH. Blood pressure measurement in pregnancy. *Obstet Gynaeco* 2015;17(2):91–8.
38. Lim W, Lee Y, Tan C, Kwek K, Chong Y, Gluckman PD, et al. The association between maternal blood pressures and offspring size at birth in Southeast Asian women. *BMC Pregnancy Childbirth* 2014;14(1):403.
39. Titaley CR, Hunter CL, Heywood P, Dibley MJ. Why don ' t some women attend antenatal and postnatal care services ? *BMC Pregnancy Childbirth*. 2010;10(1):61.
40. Haddrill R, Jones GL, Mitchell CA, Anumba DOC. Understanding delayed access to antenatal care: a qualitative interview study. *BMC Pregnancy Childbirth* 2014;14(1):1–24.
41. Biza A, Jille-Traas I, Colomar M, Belizan M, Requejo Harris J, Crahay B, et al. Challenges and opportunities for implementing evidence-based antenatal care in Mozambique: A qualitative study. *BMC Pregnancy Childbirth.* 2015;15(1):1–10.
42. Ejigu T, Woldie M, Kifle Y. Quality of antenatal care services at public health facilities of Bahir-Dar special zone , Northwest. *BMC Health Serv Res*. 2013;13(443):1–8.
43. Aniebue UU, Aniebue PN. Women's perception as a barrier to focused antenatal care in Nigeria: the issue of fewer antenatal visits. *Health Policy Plan*. 2011 Sep 1;26(5):423–8.
44. Pell C, Meñaca A, Were F, Afrah NA. Factors Affecting Antenatal Care Attendance: Results from Qualitative Studies in Ghana, Kenya and Malawi. Moormann AM, editor. *PLoS One*. 2013 Jan 15;8(1):e53747.
45. Gross K, Schellenberg JA, Kessy F, Pfeiffer C, Obrist B. Antenatal care in practice: An exploratory study in antenatal care clinics in the Kilombero Valley, south-eastern Tanzania. *BMC Pregnancy Childbirth.* 2011;11:1–11.
46. Muganyizi PS, Shagdara MS. Predictors of extra care among magnesium sulphate treated eclamptic patients at Muhimbili National Hospital, Tanzania. *BMC Pregnancy Childbirth*. 2011;11.
47. Kidanto HL, Wangwe P, Kilewo CD, Nystrom L, Lindmark G. Improved quality of management of eclampsia patients through criteria based audit at Muhimbili National Hospital, Dar es Salaam, Tanzania. Bridging the quality gap. *BMC Pregnancy Childbirth*. 2012 Nov 21;12:134.

48. Ulin PR, Robinson ET, Tolley EE. Invitation to Explore. In: Qualitative Methods in Public Health : A Field Guide for Applied Research. first Edit. jossey bass; 2005. p. 318.
49. Graneheim UH, Lundman B. Qualitative content analysis in nursing research: Concepts, procedures and measures to achieve trustworthiness. Vol. 24, Nurse Education Today. 2004. p. 105–12.
50. August F, Pembe AB, Mpembeni R, Axemo P, Darj E. Effectiveness of the Home Based Life Saving Skills training by community health workers on knowledge of danger signs, birth preparedness, complication readiness and facility delivery, among women in Rural Tanzania. *BMC Pregnancy Childbirth* 2016;16(1):1–12.
51. Barbosa IRC, Silva WBM, Cerqueira GSG, Novo NF, Almeida FA, Novo JLVG. Maternal and fetal outcome in women with hypertensive disorders of pregnancy: the impact of prenatal care. *Ther Adv Cardiovasc Dis*. 2015;9(4):140–6.
52. Desalegn DM, Abay S, Taye B. The availability and functional status of focused antenatal care laboratory services at public health facilities in Addis Ababa, Ethiopia. *BMC Res Notes*. 2016;9(1).
53. Best LG, Lunday L, Webster E, Falcon GR, Beal JR. Pre-eclampsia and risk of subsequent hypertension: in an American Indian population. Hypertens pregnancy *BMC R es Notes* 2017:36(2):131–7.
54. Organization world health. WHO Recommendation on Antenatal care for positive pregnancy experience. WHO Recomm Antenatal care Posit pregnancy. 2016;152.
55. HS R, Cnattingius S, Lipworth L. Comparison of risk factors for preeclampsia and gestational hypertension in a population-based cohort study. *Am J Epidemiol* 1998;147(11):1062–70 9p.
56. Högberg U. The decline in maternal mortality in Sweden: The role of community midwifery. *Am J Public Health.* 2004;94(8):1312–20.

9.0 APPENDICES

9.1 APPENDIX 1 QUESTIONNAIRE: ENGLISH VERSION.

ASSESSMENT OF THE QUALITY OF ANTENATAL CARE RECEIVED BY WOMEN WITH HYPERTENSIVE DISORDERS POST DELIVERY WHO ARE ADMITTED AT MUHIMBILI NATIONAL HOSPITAL

APPENDIX 1: CHECKLIST DATE…… CODE NO……..

I: SOCIAL DEMOGRAPHIC INFORMATION

SN	DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS	
1	AGE	Age(years)
2	MARITAL STATUS	1 single 2 Married 3 Divorced/separated 4 Cohabiting
3	EDUCATION LEVEL	1 No formal Education 2 primary school 3 secondary school 4Diploma 5 University level or above
4	OCCUPATION	1 employed 2 petty trader 3 Unemployed 4 Student

II OBSTETRIC PARTICULARS

	GRAVIDA	……..
6	PARITY	…….
7	MISCARRIAGE	1 FIRST TRIMESTER……. 2 2NDTRIMESTERS…… 3 3RDTRIMESTERS……
8	NO OF CHILDREN	……
9	THE FIRST DAY OF LNMP	……..
10	GESTATION AGE(GA)(Calculated by adding 7 to the 1st day of LNMP and subtracting 3 from the respective month)	1 AT BOOKING…… 2 CURRENT GA…….
11	ADMISSION	1 REFERRAL FROM…… ……. 3 SELF REFERRAL…….……
12	REASONS FOR REFERRAL	……..
13	DELIVERED	1 YES 2 NO
14	NAME OF ANC CLINIC ATTENDED This information is obtained from RCH card	……

III DIAGNOSIS / DISEASE CATEGORY AND SEVERITY DIAGNOSED AT MNH

15	BLOOD PRESSURE LEVELS (tick appropriate blood pressure)	1 LESS THAN 140/90 2 140/90-149/99 3 150/100-159/100 4 ≥ 160/110
16	ECLAMPSIA (*If the patient was delivered elsewhere indicate name of the health facility*)	AT MNH…….. (OTHERS) FACILITY NAME ……
17	PREECLAMPSIA (tick whichever appropriate)	1 PROTEINURIA a) Trace b) + c) ++ or more d) Platelet ≤ 100 000 e) Elevated i) ALT ii) ASAT f) I)headache Ii) right upper abdominal pains
18	CHRONIC HYPERTENSION (*Confirm that ,the patient had elevated BP before 20weeks without proteinuria, and ormore than 12 weeks post delivery,from lab and patient file*),tick on the right side	
19	GESTATION HYPERTENSION (*elevation of BP after 20 weeks without proteinuria*);tick on the right side	
20	PRE ECLAMPSIA SUPERIMPOSED ON CHRONIC HYPERTENSION(*proteinuria on chronic hypertension*)	

IV) BLOOD PRESSURE MEASUREMENT AND URINE FOR PROTEIN ON EVERY VISIT

Put a tick in the appropriate box of respective visit in which blood pressure and urine for protein checked

SN	PROCESS ATTRIBUTES	NO OF ANTENATAL VISITS IN WHICH URINE AND BLOOD PRESSURE CHECKED														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	BLOOD PRESSURE															
2	URINE FOR PROTEINE															

V) THE NUMBER OF VISITS ATTENDED IN FIRST, SECOND AND THIRD TRIMESTER.

Put a tick in the appropriate box in the respective trimester for which for which the woman had attended that visit

NOTE: At least 2 visit per trimester or 4 visits or more in a term pregnant.

TRIMESTERS	THE NUMBER OF ANTENATAL VISITS ATTENDED															TOTAL VISITS
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
FIRST																
SECOND																
THIRD																

QUALITY OF ANTENATAL CARE RECEIVED BY WOMEN WITH HYPERTENSIVE DISORDERS POST DELIVERY WHO ARE ADMITTED AT MUHIMBILI NATIONAL HOSPITAL

VII) A QUESTIONNAIRE FOR ASSESSING COUNSELING OF DANGER SIGNS:

WERE YOU COUNSELED OF THE DANGER SIGNS DURING ANC CLINIC?
(*tick in the appropriate space*)
1) YES……. 2**) NO**……..
If yes ,CAN YOU MENTION THEM***(counter check with the list below as she mentions and put a tick in the appropriate box)***

DANGER SIGNS	**YES**	**NO**
1) HEADACHE		
2) BLURRED VISION		
3) RIGHT UPPER ABDOMINAL PAINS		
4) PV BLEEDING		
5) DECREASED FETAL MOVEMENT		
6) HIGH FEVER		
7) EXCESSIVE TIREDNESS OR BREATHLESSNESS		
8) SWOLLEN HANDS AND FACE		

1) If the patient mentions one among the listed danger signs, she is considered to have Counseled.

EXPLORATION OF WOMEN'S VIEWS ON THE SERVICES PROVIDED

Mothers will be asked questions to explore their views on various services they received during antenatal visits.

QU. 1) Can you explain how much you were satisfied with the services provided on the following service

I. Counseling on danger signs
II. Blood pressure measurement
III. Screening services to test urine for protein

2) 1) what were you interested of when you were receiving the services above?

I. ….……
II. ……..
III. …….
IV. ……

3) What are the important things that are lacking in the provision of quality services for women with hypertensive disorders?

I)……

II)……

III)……

IV)……..

9.2 APPENDIX II QUESTIONNAIRE-SWAHILI VERSION

HOSPITALI YA TAIFA YA MUHIMBILI

IDARA YA MAGONJWA YA KINA MAMA NA UZAZI

UCHUNGUZI WA KIWANGO CHA HUDUMA WALIZOPATA KATIKA KLINIKI ZA WAJAWAZITO; AKINA MAMA WENYE SHINIKIZO LA DAMU KIPINDI CHA UJAUZITO NA BAADA YA KUJIFUNGUA AMBAO WAMELAZWA HOSPITALI YA TAIFA MUHIMBILI.

DODOSO LA MASWALI

NAMBA YA UTAMBULISHO…….

I) TAARIFA BINAFSI ZA MHUSIKA

Tafadhali weka alama ya vema panapohusika

NA	TAARIFA BINAFSI	
1)	UMRI(miaka)	(Jaza miaka yako hapa chini).
2)	HALI YA NDOA	1 sijaolewa 2 nimeolewa 3 nimetalakiwa 4 ninaishi na mwenza
3)	KIWANGO CHA ELIMU	1 Sijasoma 2 Shule ya Msingi 3 Secondari 4Diploma 5 Chuo kikuu au zaidi
4)	KAZI	1 Nimeajiriwa 2 Biashara ndogo ndogo 3 Sijaajiliwa 4 Mwanafunzi.

II) TAARIFA ZA UJAUZITO

	MIMBA YA NGAPI	……..
6	UMEZAA MARA NGAPI	…….
7	MIMBA ZILIZOHARIBIKA(weka alama ya vema kwenye nafasi wazi kulia)	A)NDANI YA KIPINDI CHA MWEZI 1 HADI MITATU(WIKI 4 HADI 12)…… B) MIEZI 4 HADI 6(WIKI 16 HADI 24) …… C) MWEZI WA 7 HADI 9(Wiki 28 hadi 40)……
8	IDADI YA WATOTO	……
9	SIKU YA KWANZA KWA MARA YA MWISHO KUONA SIKU ZAKO	……..
10	UMRI WA MIMBA KWA TAREHE(umekokotolewa kwa kujumlisha 7 katika jibu la no 9 hapo juu,kutoa 3 katika mwezi husika)	1 ALIPOANZA KLINIKI……(WIKI) 2 KWA KIPINDI HIKI…….(WIKI)
11	TAARIFA ZA KULAZWA	1 RUFAA KUTOKA…… ……. 3 MGONJWA KAJA MWENYEWE…….……
12	SABABU ZA RUFAA	……..
13	MGONJWA AMEJIFUNGUA (Weka alama ya vema panapohusika)	1 NDIYO…….. 2 HAPANA…….
14	JINA LA KLINIKI ALIYOHUDHURIA	……

III AINA YA SHINIKIZO LA DAMU KIPINDI CHA UJAUZITO NA UGUNDUZI WAKE

15	KIWANGO CHA SHINIKIZO LA DAMU (Weka alama ya vema panapohusika)	1 CHINI 140/90 2 140/90-149/99 3 150/100-159/100 4 ≥ 160/110
16	KIFAFA CHA MIMBA (*onyesha mahali mgonjwa alipopata kifafa cha mimba*)	AT MNH…….. (OTHERS) FACILITY NAME ……
17	SHINIKIZO LA DAMU WIKI 20 NA ZAID PAMOJA NA PROTEIN KWENYE MKOJO LINALOASHIRIA KIFAFA CHA MIMBA(severe pre eclapsia) (weka alama ya vema kwenye kiasi cha protein)	1 KIASI CHA PROTEIN KWENYE MKOJO g) Kiasi kidogo(trace) h) + i) ++ au zaidi j) Platelet ≤ 100 000 k) Kuongezeka i) ALT ii) ASAT l) i)Maumivu ya kichwa Ii) kutoona vizuri iii)maumivu ya tumbo upande kulia juu
18	SHINIKIZO LA DAMU KABLA YA MIMBA AU WIKI 20(CHRONIC HYPERTENSION)(angalia kipimo cha mkojo) (Jiridhishe kuwa, mgonjwa hana protein kwenye mkojo,kasha weka alama ya vema kulia)	
19	SHINIKIZO LA DAMU KATIKA MIMBA HII KUANZIA WIKI 20 NA ZAIDI (GESTATION HYPERTENSION)(Jiridhishe hakuna protein kwenye mkojo) Kama ni sahihi weka alama ya vema kulia kwako	
20	SHINIKIZO LA DAMU KABLA YA WIKI 20 LIAMBATANALO NA PROTEIN KWENYE MKOJO(pre eclampsia superimposed on chronic hypertension)	**(**Weka vema kwenye kibox hiki baada ya kubainisha aina ya shinikizo)

IV) UPIMAJI WA SHINIKIZO LA DAMU NA PROTEIN KWENYE MKOJO KWA KILA HUDHRIO

SN	AINA YA HUDUMA	MAHUDHURIO AMBAYO MGONJWA ALIPIMWA SHINIKIZO LA DAMU NA UCHUNGUZI WA PROTIN KWENYE MKOJO														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	KUPIMA SHINIKIZO LA DAMU															
2	PROTIN KWENYE MKOJO															

Weka alama ya vema kwa kila hudhurio alilofanya vipimo hivyo

V) IDADI YA MAHUDHURIO KATIKA KILA THERUTHI(MIEZI 3) YA KIPINDI CHA UJAUZITO YA KWANZA,YA PILI, NA YA TATU

Weka alama ya vema kwa kila hudhurio alilofanya katika kila theluthi ya ujauzito .

THELUTHI YA Umri wa mimba	MAHUDHURIO KWA KILA THELUTHI YA KIPINDI CHA UJAUZITO															JUMLA
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
YA KWANZA (WIKI 4- 12)																
YA PILI (WIKI 16-24)																
YA TATU (WIKI 28-40)																

VII) USHAURI JUU YA VIDOKEZO VYA HATARI

NAOMBA UNITAJIE VITOKEZO VYA HATARI VIAMBATANAVYO NA SHINIKIZO LA DAMU(msikilize mgonjwa anavyotaja huku ukiangalia list ya vidokezo vya hatari hapo chini, akipatia weka neon NDIO,akikosa HAPANA)		
VIDOKEZO VYA HATARI	**NDIO**	**HAPANA**
9) MAUMIVU YA KICHWA		
10) KUTOONA VIZURI		
11) KUUMWA TUMBO UPANDE WA KULIA JUU		
12) KUTOKWA DAMU UKENI		
13) MTOTO KUPUNGUZA KUCHEZA		
14) HOMA		
15) KUPUMUA KWA SHIDA		
16) KUVIMBA USO/MIKONO		

KIWANGO CHA KURIDHIKA KUTOKANA NA HUDUMA ILIYOTOLEWA KUHUSIANA NA MAMBO YAFUATAYO

Mama ataulizwa swali kuhusiana na kuridhishwa kwake wakati akipata huduma,kwa kila kipengere cha huduma, msikilize kwa makini na kwa kila kipengere cha huduma aliyopewa bainisha kiwango cha huduma kama ni cha juu,cha kawaida au cha chini.

SWALI 1) .Unaelezeaje kuridhishwa kwako kuhusiana na huduma ulizopata kliniki ya kina mama wajawazito wakati ulipokuwa ukipewa huduma zifuatazo.

IV. Ushauri kuhusiana na dalili za hatari
V. Upimaji wa shinikizo la damu
VI. Huduma ya kupima protein kwenye mkojo

SWALI 2) Ni mambo gani uliyafurahia katika huduma tatu hapo 1)

V. ….……
VI. ……..
VII. …….
VIII. ……

SWALI 3)Unafikiri ni vitu gani vinapungua katika utoaji wa huduma ya akina mama wajawazito wenye shinikizo la damu.

I)……

II)……

III)……..

9.2 APPENDIX III : CONSENT FORM

The information obtained from you will be confidential. No name will appear on any document of this study instead Identification numbers will be used.

Participation and right to Withdraw

Participationin of this study is voluntarily. You can participate or refuse to participate and your refusal to participate from this study will not interfere with your management.

Benefits

The information that you provide will help us to establish the the proportion of mothers with hypertensive disorders in pregnancy admitted at MNH who received good quality of antenatal care during their antenatal clinic and proportional of those who had poor quality. Thus the study will improve management and outcomes of a patient there by improving quality of life and better services for women with hypertensive disorders in pregnancy.

Personal Contact

If you encounter any questions about this study, you should contact the following;

- ✓ Principal Investigator, Dr.Isaya E.Mhando, Muhimbili University of Health and Allied Sciences, P. O. Box 65001, Dar es Salaam. Mobile No. 0759 881 350**.**

OR Any doubts about your rights of participation in this study you may contact

- ✓ Dr. Joyce Masalu Chairperson of the Senate Research and Publications Committee,

P. O. Box 65001 DSM. Telephone**: +255754 757577**

Participant declaration

I ……. have read the contents in this form. My questions have been answered. I am willing to participate in this study.

Signature of participant ……Date…….……

Signature of Researcher ……..Date……

9.4 APPENDIX IV: CONSENT FORM (SWAHILI VERSION)

CHUO KIKUU CHA SAYANSI ZA AFYA MUHIMBILI
KURUGENZI YA TAFITI NA UCHAPISHAJI

FOMU YA RIDHAA

Namba ya utambulisho ---

Ridhaa ya kushiriki kwenye utafiti

Jina langu ni Dr.Isaya E. Mhando; nafanya utafiti wenye lengo la kuangalia kiwango cha Huduma waliyopata kipindi cha kliniki za ujauzito wao, akina mama wenye shinikizo la Damu wakati wa ujauzito/waliokwisha jifungua ambao wamelazwa katika kitengo cha akina mama waja wazito Hopitali ya Taifa Muhimbili.

Madhumuni ya utafiti

Madhumuni ya Utafiti huu ni kujua kiwango cha huduma za kliniki walizopewa akina mama wenye shinikizo la damu waliokwisha jifungua ambao wamelezwa hospitali ya taifa Muhimbili, nakutambua sehemu ya kina mama wenye shinikizo la damu waliokwishajifungua, waliopata kiwango cha huduma cha juu, cha kuridhisha au kiwango duni ili kuboresha huduma ya kundi hili wakati ujauzito na kusaidia kuleta maisha bora.

Jinsi ya kushiriki

Akina mama wenye shinikizo la damu walikwishajifungua ambao wamelazwa katika hospitali ya taifa Muhimbili baada ya kuridhia kushiriki utafiti huu, watahojiwa maswali.

Usiri

Taarifa zote zitakazokusanywa kupitia dodoso hili zitakuwa ni siri. Jina lako halitatumika badala yake tutatumia namba ya utambulisho.

Uhuru wa kushiriki na haki ya kujitoa

Kushiriki kwenye utafiti huu ni hiari. Unaweza kushiriki au kukataa kushiriki na hii haitakuondolea haki ya kupata matibabu yako.

Nani wa kuwasilian anaye

Kama una maswali kuhusiana na utafiti huu, wasiliana na mtafiti mkuu,

- ✓ Dr. Isaya E. Mhando, Chuo Kikuu cha Afya na Sayansi zaTiba Muhimbili, S. L. P. 65001, Dar es Salaam. Simu ya kiganjani 0759 881 350.
  AU
- ✓ Dr Joyce Masalu Mwenyekiti wa kamati ya Utafitina Uchapishaji, S.L.P 65001,

Dar es Salaam. Simu**+255754 757577**

Kukubali kushiriki

Mimi..... nimesoma maelezo ya fomu hii nimeyaelewa na

Nimekubali kushiriki katika utafiti huu.

Sahihi ya mshiriki…… Tarehe ya kutia sahihi…….....

Sahihi ya mtafiti…… Tarehe ya kutia sahihi……..