ASSESSEMENT OF KNOWLEDGE OF AND ADHERENCE TO THE RECOMMENDED INTRAPARTUM OBSTETRIC GUIDELINES FOR PMTCT OF HIV BY HEALTH WORKERS AT MBAGATHI DISTRICT HOSPITAL, NAIROBI

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DECLARATION

This is to certify that this thesis entitled 'Assessment of knowledge of and adherence to the recommended intrapartum obstetric guidelines for PMTCT of HIV by health workers at Mbagathi District Hospital, Nairobi' is my bona fide research work and it has not been presented for a degree or any other award in any other university.

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APPROVAL BY SUPERVISORS

This is to certify that this thesis entitled **"**Assessment of Knowledge of and adherence to the recommended Intrapartum Obstetric Guidelines for PMTCT of HIV by Health Workers at Mbagathi District Hospital, Nairobi" was carried out independently by Dr Abade Robert Ulalo under our guidance and supervision and has been submitted to the University with our full approval as internal supervisors**.**

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CERTIFICATE OF AUTHENTICITY

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DEDICATION

I must express my very profound gratitude to my parents and to my siblings for providing me with unfailing support and continuous encouragement throughout my years of study and through the process of researching and writing this thesis. This accomplishment would not have been possible without my best friend Dr. Simaton Munke. Thank you.

LIST OF ABBREVIATIONS

AIDS	Acquired Immuno-Deficiency Syndrome
ANC	Antenatal Clinic
ARV	Antiretroviral Therapy
CO	Clinical Officer
CS	Caesarean Section
FGD	Focused Group Discussion
HCWs	Health Care Workers
HIV	Human Immunodeficiency Virus
KAIS	Kenya AIDS Indicator Survey
KII	Key Informant Interview
KNH	Kenyatta National Hospital
MDH	Mbagathi District Hospital
MDG	Millennium development goals
MO	Medical Officer
PMTCT	Prevention of Mother to Child Transmission
PPH	Postpartum Haemorrhage
RNA	Ribonucleic Acid
SDA	Seventh Day Adventist
SPSS	Statistical Package for Social Sciences
STI	Sexually Transmitted Infections
UNAIDS	United Nation Program on AIDS
UoN	University of Nairobi
VCT	Voluntary Counselling and Testing
WHO	World Health Organization

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ABSTRACT

Introduction: In Kenya, 37,000-42,000 infants are infected with HIV yearly due to mother-to-child transmission (MTCT). Even though intra-partum obstetric guidelines for PMTCT of have been developed and ratified by the Ministry of Health (MoH) to lower the incidence of MTCT, there is paucity of data on the knowledge of and the adherence to these recommended protocols by health care workers in Nairobi County.

Objective: To determine the level of knowledge of healthcare workers on the recommended intrapartum guidelines for PMTCT and the level of adherence to the recommended guidelines when tending to HIV positive patients at Mbagathi District Hospital, Nairobi

Methodology: A cross-sectional study was done at Mbagathi District Hospital. Observation of deliveries by 110 healthcare workers was done by trained research assistants, a structured questionnaire used to collect data, and Focus Group Discussions (FDGs) used for informant interviews. Quantitative data was analysed using SPSS version 17. Descriptive statistics were computed and visualised in tables and charts and the Chi square test used to test the relationship between the dependent and independent variables. Qualitative data was transcribed verbatim, coded into discrete lines of text, and the NVIVO statistics software used for data analysis.

Results: One hundred and ten (110) health care workers were interviewed. A majority (50.9%) were aged between 25 and 34 years. Females (65.5%) were more than males (34.5%). Around while 67.3% had attained tertiary level education while university graduates constituted 32.7% of the population. In terms of qualification, most respondents (39.1 %) were nurses. Clinical officers (CO) were 25.5% of the population while trainee nurses were 17.9% .At the time of the study, most health workers interviewed (58.2%) had spent less than one year in the labour ward. Only 41.8% had training on PMTCT, 87.3% of which were knowledgeable on the recommended intrapartum obstetric methods for PMTCT. Sex ($p=0.05$) and qualification ($p=0.97$) of respondents did not influence the awareness of intrapartum methods significantly. PMTCT training, however, influenced awareness of the recommended intra partum obstetric methods, with trained heath workers being 11 times more aware of the recommended protocols than those with no training (OR=11 (95%CI=2.3-52), $p<0.01$). Respondents with university level of education were also aware of the recommended intrapartum protocols for PMTCT than those with tertiary level education (OR=17 (95%CI=1.0-302), $p=0.00$). Only 38.15% practiced nine or more ($\leq$75%) of the recommended 12 PMTCT protocols by the MoH during delivery. While practice of standard protocols such as such as minimising vaginal examinations (87.3%), discouraging prolonged labour (87.3%), and immediate cord clamping were almost universal, only 34.5%, 29.1%, and 27.3% of healthcare workers cleansed neonates, cleansed vaginas with antiseptics after membrane rupture, and presented women with the option of elective caesarean section (CS) before onset of labour respectively. Females (81%) adhered to the recommended guidelines for PMTCT more than males (19%) (OR=3.4 (95%CI=1.4 to 8.3), $p=0.01$. Workers with PMTCT training (57.1%) also adhered to the recommended intra partum guidelines for PMTCT of HIV 1 than those with no training (42.9%) (OR=2.8 (95%CI=1.3- 6.2), $p=0.01$).

Conclusion: Knowledge of intrapartum obstetric methods of PMTCT was high (87.3%) among the healthcare in the labour ward of Mbagathi District Hospital. Unfortunately, adherence to the recommended protocols was poor (38.18%) and variable by gender, PMTCT training, and experience of healthcare workers. Workload, staff shortages, patient

complications, and lack of adequate resources were identified as key reasons for poor adherence to PMTCT protocols.

CHAPTER ONE

INTRODUCTION AND LITERATURE REVIEW

1.1 Background

HIV is a debilitating viral infection that afflicts an estimated 35.3 million people worldwide. In 2009, approximately 370,000 children were infected with HIV, with approximately 42,000 to 60,000 HIV-1-exposed women in low-income countries dying of the disease. The long term care of such HIV orphaned infants is not only a major burden to the health care system but also to the affected families. In contrast, the number of new HIV-1 infections among neonates and maternal deaths due to HIV-1 in high-income countries was zero over the same duration, because of sound medical practice (1).

Whilst a few cases occur in utero, the incidence of MTCT is highest during labour, delivery, and breastfeeding. Unlike trans-placental transmission of HIV-1 to babies that only accounts for 5%-8% of new cases, labour and delivery pose a much greater risk, with 10%-20% of neonates becoming infected at this stage. (2)

In Kenya, an estimated 37,000 to 42,000 infants are vertically infected with HIV every year. As determined by DNA PCR of infants aged between six weeks and one year old, MTCT rates in Kenya have been declining over the years. From a high of 27% in 2007, the incidence of new cases has dropped significantly to approximately 10%-15% with the implementation of the Global Plan in Africa in 2011. (2).The essential role that widespread use of antiretroviral therapy (ART) and planned caesarean sections contribute to this success has been demonstrated in several studies. However, obstetric factors have also been associated with MTCT. Unfortunately, whether health workers are knowledgeable and are adhering to the intrapartum obstetric guidelines for PMTCT in Kenya is a matter of speculation.

Implementation of the recommended obstetric guidelines for PMTCT and HIV by health workers is vital in the fight against HIV (4).

1.2 Human Immunodeficiency Syndrome (HIV)

AIDS is caused by RNA retroviruses termed human immunodeficiency viruses, HIV-1 and HIV-2. Most cases worldwide are caused by HIV-1 infection. Sexual intercourse is the main mode of transmission. It is also transmitted by blood and contaminated blood products and by Mother to Child Transmission (MTCT). Clinical illness with AIDS is due to profound immunosuppression, which predisposes cases to opportunistic infections and neoplasms and eventually death (5,6, 7). Even though pregnancy has minimal effects on CD4+ level, T-cell count, and HIV RNA levels (8); MTCT is remains a challenging health concern in many developing countries with only 50% of HIV exposed neonates surviving beyond the age of two years(3).

1.3 Maternal and Perinatal Transmission of HIV

MTCT is a common cause of paediatric HIV infections with about 15% to 40% of neonates born to untreated HIV infected non-breastfeeding women becoming infected with the virus. Approximately 20% are infected before 36 weeks, 50% in the days before delivery, and 30% intra-partum (9). Transmission rates during breastfeeding are the highest with 30% to 40% being infected at this stage (10, 11). Vertical transmission is also common with preterm births, especially with prolonged membrane rupture. According to Kuhn *et al*. (12), the risk of MTCT of HIV increases by 3.7% with preterm delivery and 25% for women who undergo membrane rupture for over 4 hours prior to delivery.

1.4 Factors Associated with MTCT of HIV

1.4.1 Obstetric Factors

Several obstetric factors have been associated with MTCT of HIV. During labour and delivery for instance, HIV transmission occurs if the infant aspirates, imbibes, or sucks maternal blood or cervical secretions during birth (13). Invasive and or traumatic medical procedures, instrumental deliveries, amniocentesis, episiotomy, external cephalic version, or intrapartum procedures that induce haemorrhage during labour or birth increase the risk of transmission particularly in mothers with a high viral load (14).

1.4.2 Maternal and Foetal Factors

The relationship between maternal factors such as viral load and use of antiretroviral drugs during pregnancy and MTCT has been demonstrated in studies (15, 16). High maternal viral load and antiviral misuse, and foetal factors such as ruptured skin and or membrane lesions, sustained assisted vaginal delivery techniques, and low foetal gestational age during delivery have been associated with an increased risk of MTCT of HIV.

1.5 PMTCT Guidelines in Kenya

One of the priority areas of the Kenya National AIDS Strategic plan (2000-2010) is to eliminate MTCT of HIV. Health workers, for instance, must adhere to a set of strict clinical and public health standards, and a cascade of interventions beginning with HIV counselling and testing of all pregnant mothers at initiation of antenatal care (ANC). To lower MTCT of HIV, it also proposes provision of antiretroviral drugs (ARVs) during pregnancy, preterm, and post-term periods, and modification of routine intrapartum obstetric care during labour and delivery. Though strict adherence to protocols for PMTCT of HIV has reduced the incidence of MTCT of HIV in many countries (17, 18, 19) data on the knowledge of and

adherence to recommended intrapartum obstetrics guidelines of PMTCT of HIV in Kenya is limited.

1.6 Intra-Partum Obstetric Methods of PMTCT of HIV

Intra-partum obstetric methods of PMTCT of HIV are selected modified obstetric techniques used to reduce the risk of transmission of HIV from mothers to neonates during labour and delivery. According to the Guidelines for Prevention of Mother to Child Transmission (PMTCT) of HIV/AIDS in Kenya, 2012, this involves

1. HIV testing prior to or during labour and delivery
2. Minimizing vaginal examinations
3. Using aseptic techniques during delivery
4. Avoiding routine artificial rupture of membranes
5. Avoiding unnecessary trauma during labour and delivery
6. Minimizing the risk of PPH
7. Use of safe blood transfusion services
8. Providing the appropriate mode of delivery

Other guidelines from countries such as Thailand and Lesotho include immediate cord clumping, avoiding cord milking, avoid routine airway suctioning, vaginal cleansing with chlorhexidine after rupture of membranes, and covering the cord while cutting it to avoid spurting of blood in their protocols (20).

1.6.1 Minimizing Vaginal Examinations

During labour and delivery, repeated vaginal examinations might inflict trauma to both the mother and foetus hence increasing the chances of MTCT of HIV. It could also introduce infections into the birth canal increasing the risk of HIV transmission. To prevent MTCT of HIV, vaginal examinations should be done only when necessary and using sterile techniques.

1.6.2 Discourage Prolonged Labour

According to Tejedor et al (21), prolonged labour increases the risk of MTCT of HIV. Use of oxytoxic drugs to reduce the length of labour should therefore be encouraged.

1.6.3 Artificial Rupture of Membranes

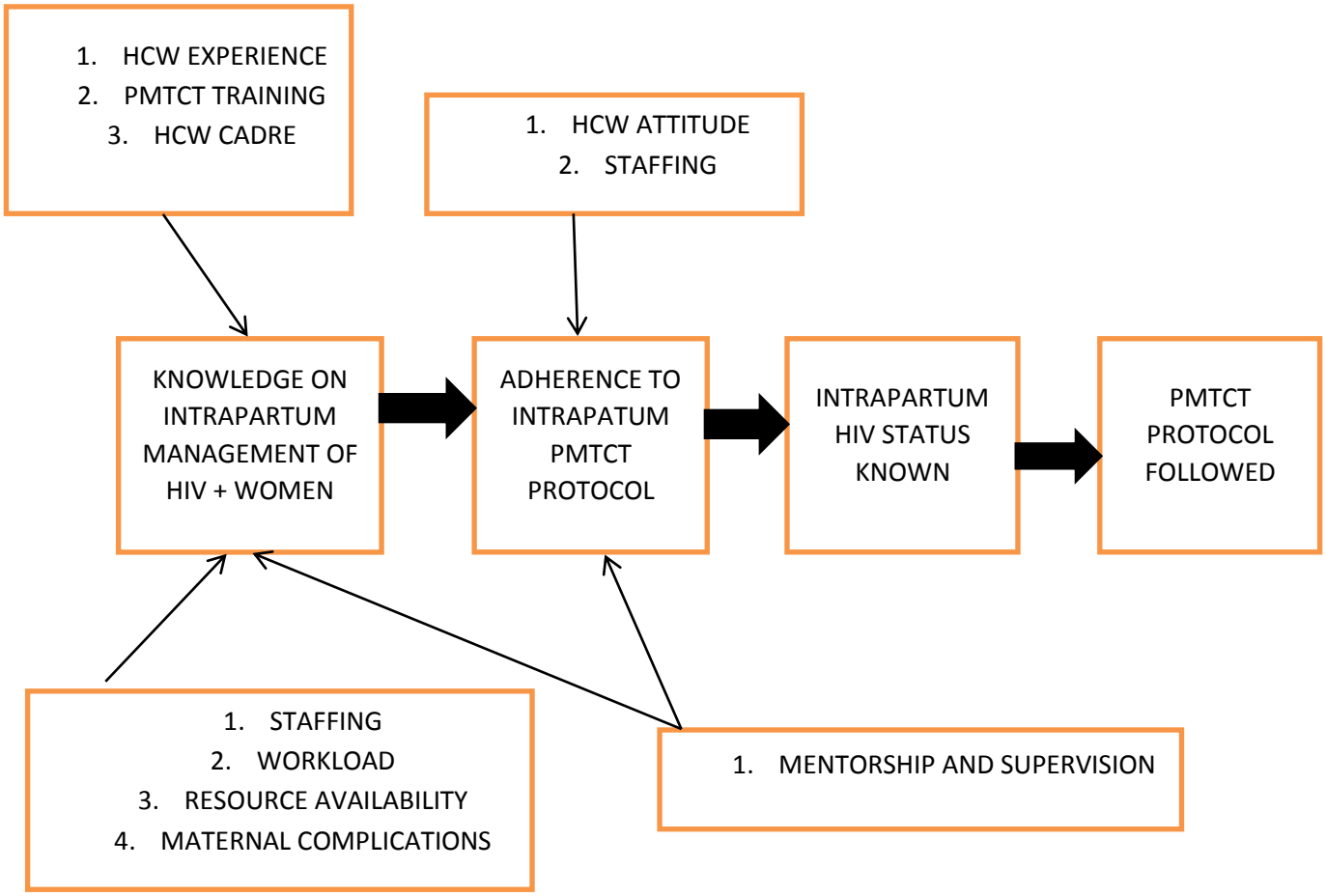
Even though membranes often rupture spontaneously at the onset of labour or a few hours before delivery, some health workers rupture membranes in an attempt to hasten delivery. This increases risk of MTCT of HIV due to ascending infections that often result after membrane rupture approximately four hours prior to delivery and prolonged exposure to contaminated maternal vaginal fluids (21, 22). A significant association has also been observed between cervical or vaginal shedding of HIV-1 provirus and infant infection, and this relationship was independent of maternal plasma virus load.

Studies have demonstrated that risk of perinatal HIV-1 transmission is increased in vaginal as compared to CS delivery following prolonged exposure to ruptured membranes and among first-born twins suggesting that exposure to infected secretions in the birth canal influences transmission. (23). If premature rupture of the membrane (PROM) is unavoidable, labour should be induced (24) or the baby delivered by emergency CS to lower risk of MTCT of HIV. Cleansing the birth canal with chlorhexidine solution after membrane rupture lasting more than 4hr has been shown to reduce MTCT of HIV (25).

1.7 HIV Testing and Counselling

PMTCT of HIV services are important entry points for HIV prevention and treatment. However, the overall coverage of PMTCT programmes and the uptake of services provided through these programmes including HIV testing and counselling and ARV prophylaxis are still very low in Kenya (26).

1.8 Conceptual Framework



1.9 Statement of the Problem

With no intervention, MTCT of HIV-1 during pregnancy, labour, delivery, postnatal, and breastfeeding occurs in 33% of HIV exposed women. To lower MTCT and bring forth HIV-free neonates, health workers must adhere to several intra-partum obstetric guidelines for PMTCT during labour and delivery. However, data on their knowledge of and adherence to these guidelines is scarce. This study will fill these gaps.

1.10 Justification of the Study

Obstetric factors have been associated with MTCT in Kenya. There are very few local studies that attempt to establish the uptake of intra-partum obstetric methods of PMTCT and even the current protocols do not put emphasis on this subject but instead concentrate more on the use

of ARVs, exclusive breast feeding and replacement feeding for PMTCT. Little is known about the barriers that hinder adherence to the recommended intrapartum methods of PMTCT.The results of this study will elucidate the status of PMTCT in Kenya in light of recommended intra-partum protocols for prevention of transmission of HIV-1, besides the knowledge and adherence to these protocols by health workers and identify barriers that if addressed can help to improve adherence and lower the incidence of neonatal HIV transmission. The findings of this study will be published in a peer-reviewed journal and the information obtained shared with the Ministry of Health and the scientific community in Kenya for policy formulation.

1.11 Research Questions

i. Are health workers at MDH labour ward knowledgeable on intra-partum obstetric guidelines for PMTCT of HIV-1?
ii. Are health workers adhering to the recommended intra-partum obstetric guidelines for PMTCT of HIV-1?
iii. Which factors promote non-adherence to the recommended intra-partum obstetric guidelines for PMTCT of HIV-1?

1.12 Objectives of the Study

1.12.1 General Objective

To assess the knowledge of and adherence to the recommended intra-partum obstetric guidelines for PMTCT and HIV-1 by health workers at MDH labour ward

1.12.2 Specific Objectives

i. To assess the health worker's knowledge of the recommended intra-partum obstetric guidelines for PMTCT of HIV-1

ii. To determine whether health workers are adhering to the recommended intra-partum obstetric guidelines for PMTCT of HIV-1

iii. To identify factors promoting non-adherence to intra-partum obstetric guidelines for PMTCT of HIV-1

CHAPTER TWO

2 MATERIALS AND METHODS

2.1 Study Design

This wasa cross-sectional hospital-based study

2.2 Study Site

The study was done in Mbagathi District Hospital (MDH), Nairobi. MDH is a public facility managed by the Ministry of Health. It has a catchment population of approximately three million and serves as the main district hospital in Nairobi County. MDH is located near Kibera slums, a densely populated and under-served informal settlement characterized by poor sanitation, lack of clean water, poor waste disposal, high disease burden and high levels of unemployment. Approximately two million people reside in Kibera making it one of the largest informal settlements in Africa. Even though MDH's catchment has a low level of malaria transmission, the prevalence of HIV/AIDS and other tropical infectious diseases is high. MDH serves approximately 1,000 patients per day with an average of 450 deliveries recorded in its 120 bed-capacity maternity wing every month. Herein, the HIV prevalence among delivering mothers during the first quarter of 2015 was between 3.3% and 4.6%.

2.3 Study Population

The target population for this study was health workers providing intra-partum care to HIV positive expectant women in MDH labour ward i.e. Doctors (consultant obstetricians and gynaecologists, medical officers and medical officers on internship), clinical officers, nurses, and trainee nurses attached to the labour ward.

2.4 Inclusion Criteria

Doctors, clinical officers, nurses, and trainee nurses responsible for provision of front line care during labour and delivery in MDH's labour ward.

2.5 Exclusion Criteria

Doctors, clinical officers, nurses and trainee nurses who declined to give consent

2.6 Sample Size Calculation

Cochran's formula for prevalence studies will be used to calculate sample size (n):

$$n = \frac{Z_{\propto}^2 \ p(1-p)}{d^2}$$

Where Z represents the standard normal deviation score of 1.96 for the 95% level of significance; p the observed proportion of deliveries in HIV positive mothers receiving adequate intra-partum PMTCT cover during labour and delivery (assumed 50%), and d the margin of error around the estimate of correct birth weights set at 10%.

$$n = \frac{1.96^2 \ \ 0.5(1-0.5)}{0.1^2} = 96$$

The minimum sample size (n) for this study was 96 health care worker-patient pairs.

2.7 Sampling Procedure

Consecutive sampling was used to ensure complete enumeration and observation of deliveries meeting the study inclusion criteria. Consecutive sampling is ideal because there is no existing sampling frame to be used in random selection of observation episodes and secondly, due to the limited number of HIV positive deliveries systematic sampling at regular sampling intervals is not desirable. Separately, sampling of health workers was done using purposive sampling to identify health workers who were well placed to meet the objectives of the study and specifically targeted health workers offering intra-partum PMTCT care.

2.8 Variables

The dependent variable was health workers' adherence to the recommended intra-partum obstetric guidelines for PMTCT in HIV positive women. Independent variables included

were demographics, education level, religion, qualification, prior PMTCT training and experience of health workers. Demographics of patients, parity, clinical HIV staging, duration of living with HIV, contraceptive methods used, ARV usage, prior attendance of ANC, and disclosure of HIV sero-status to partners by patients were the other independent variables analysed.

2.9 Data Collection Techniques

To avoid bias, healthcare workers were blinded. Patients were recruited, consented, and interviewed using a questionnaire. Patients were then followed up in the maternity ward during delivery and the level of care given documented by research assistants by direct observation (prospective data) and or archived records of partograghs and or clinical notes (retrospective data). Healthcare workers responsible for deliveries were then sought and interviewed to determine their qualification, experience, and their awareness of and knowledge of intrapartummethods of PMTCT of HIV 1.
Note thatby determining practice first (monitoring service delivery to patients before interviewing health workers), heath workers were not aware that their skills were being tested.

Qualitative data was then be collected from health workers using six focused group discussions and four key informant interviews (KII) to determine factors influencing utilization of intra-partum obstetric PMTCT guidelines. Voice recorders were used to document this process.

2.10 Data Analysis

Data from questionnaires and observational checklist was extracted and entered into a database using Microsoft Access. To determine whether health workers were adhering to the recommended intra-partum obstetric guidelines for PMTCT in HIV positive women, data was

imported into STATA 13.0 (StataCorp LP, Texas, USA) and adherence scores generated by first assigning a score of "1" for good PMTCT practices and "0" for wrong ones. Scores weresummed to generate an overall adherence score, converted to percentages, and re-categorised either as non-adherence (<75%) or adherence (75 %+) according to prior studies. To identify determinants of non-adherence to PMTCT procedures, frequency distributions were computed and Chi square test and analysis of odds ratios done.

2.11 Ethical Consideration

Before commencement of the study, all required ethical approvals were fulfilled. Informed consent was sought and obtained from all eligible participants. The identity of all participants remained anonymous to maintain their confidentiality. Even though the participants did not benefit financially, sensitisation campaigns were held at MDH to lower the risk of stigmatisation of health workers. PMTCT education pamphlets were distributed for training purposes after the study and referrals and follow up linkages availed to all patients in need.

2.12 Limitations of the Study

Being a cross sectional study, the direction of causality will be hard to determine. The risk of social desirability bias is also rife. Some heath workers might over-report or decline to be included in the study for fear or discrimination and or ridicule by their superiors.

CHAPTER THREE

3 STUDY RESULTS

3.1 Quantitative Data Results

3.2 Socio demographic Data of Health Worker

One hundred and ten (110) health worker/patient pairs were interviewed and deliveries observed over the duration of the study. Majority (50.9%) were aged between 25 and 34 years. Females (65.5%) were more than males (34.5%), while a majority (67.3 %) had attained tertiary level education. University graduates constituted 32.7% of the population, while 50.9% and 40.0% were married and of protestant faith respectively. In terms of qualification, most respondents (39.1 %) were nurses. Clinical officers (CO) constituted 25.5% of the population while trainee nurses at 17.9% of each and 18.5% were medical officers. At the time of the study, most health workers interviewed (58.2%) had spent less than one year in the labour ward (Table 3-1).

Table 3-1: Socio demographic characteristics of health workers

		Frequency n=110	Percentage (%)
Age	20-24	34	30.9
	25-34	56	50.9
	35+	20	18.2
Sex	Female	72	65.5
	Male	38	34.5
Education Level	Tertiary	74	67.3
	University	36	32.7
Marital status	Single	54	49.1
	Married	56	50.9
Religion	Catholic	28	25.5
	Protestant	44	40.0
	Anglican	20	18.2
	Muslim	6	5.5
	Buddhist	4	3.6
	SDA	8	7.3
Qualification	MO	20	18.5
	CO	28	25.5
	Nurse	43	39.1
	Student Nurses	19	17.3
Duration since qualification	<One year	36	32.7
	1-2 Years	30	27.3
	3-4 Years	22	20.0
	4+ Years	22	20.0
Years in labour ward	<One year	64	58.2
	1-2 Years	28	25.5
	3-4 Years	10	9.1
	4+ Years	8	7.3

3.3 Socio Demographic Data of Patients

One hundred and ten (110) patients were recruited in this study. 38.2% were aged between 25-30 years old. Over 31 year olds constituted 34.2% of the population, while 5.5% of patients were aged less than 20 years old. Most patients (80.0%) were married, giving birth to their second born babies (Para 1) (45.5%), and had been diagnosed less than a year (40.0%) before commencement of the study. Contraceptive use was at 60.0% with 54.5% and 30.3% using depoprovera injections and condoms respectively. Implants were used by 12.1% of patients and oral pills by 3.0%. A majority of participants were in stage one of HIV (WHO) (85.5%) and were counselled on safe delivery before childbirth (67.3%) (Table 3-2)

Table 3-2: Socio demographic data of patients

		Frequency (n=110)	Percentage (%)
Age	<20	6	5.5
	21-24	24	21.8
	25-30	42	38.2
	31+	38	34.5
Marital status	Single	18	16.4
	Married	88	80.0
	Divorced	2	1.8
	Separated	2	1.8
Parity	Primigravida	38	34.5
	Para 1	50	45.5
	Para 2	16	14.5
	Para 3/>	6	5.5
Location of last birth	Home	2	2.8
	Hospital	70	97.2
Duration of HIV diagnosis	<One year	44	40.0
	1-2 Years	26	23.6
	>2 Years	40	36.4
Disclosure	Yes	88	80.0
	No	22	20.0
Contraceptive use	Yes	66	60.0
	No	44	40.0
Contraceptive	Implant	8	12.1
	Depo Provera	36	54.5
	Condom	20	30.3
	Pills	2	3.0
Clinical staging	One	94	85.5
	Two	16	14.5
Counselled on safe delivery	Yes	74	67.3
	No	36	32.7

3.4 Knowledge of Intrapartum Methods of PMTC of HIV 1

Of the HCWs interviewed, 41.8% had training on PMTCT. Approximately 92.7% were aware of ARV protocols for PMTCT. Knowledge of breastfeeding protocols (exclusive and replacement) for PMTCT was universal (100%), while 87.3% knew the recommended intrapartum obstetric methods for PMTCT (Table 3-3)

Table 3-3: Knowledge of intrapartum obstetric methods of PMTCT of HIV 1 by health workers

	Frequency (n=110)	Percent (%)
Aware of PMTCT of HIV 1	110	100
Undergone PMTCT training	46	41.8
Aware of ARVs protocols of PMTCT of HIV 1	102	92.7
Aware of intrapartum obstetric methods of PMTCT	96	87.3
Aware of exclusive breastfeeding	110	100

3.5 Knowledge of intrapartum methods of PMTCT by age, sex, education, and qualification

Even though sex did not influence knowledge of intrapartum methods of PMTCT (X2=3.6, p=0.05), qualification and PMTCT training influenced awareness. Respondents with university education were 17 times more aware of intrapartum methods than those with tertiary level education (OR (85% CI) = 17 (1.0 to 302), p=0.00). PMTCT training also influenced awareness of intra partum obstetric methods, with the odds of health worker awareness being 11 times higher among trained personnel (Table 3-4).

Table 3-4: Knowledge of intrapartum obstetric methods of PMTCT of HIV 1 by age, sex, education, and qualification of heath care workers

		Aware of Intrapartum Methods				
		Yes	No	X^2	OR (95% CI)	P
Education	Tertiary	60 (62.5)	14 (18.7)	7.8	0.05 (0.00 to 0.99)	**0.00**
	University	36 (37.5)	0 (0.0)		17 (1.0 to 302)	
Sex	Female	66 (68.8)	6 (42.9)	3.6	2.9 (0.93 to 9.2)	0.05
	Male	30 (31.3)	8 (57.1)		0.34 (0.11 to 1.1)	0.05
Qualification	Trainee Nurse	19 (19.8)	0 (0.0)		REFERENCE	
	MO	20 (20.8)	0 (0.0)	0.0	1.1 (0.06 to 18)	0.97
	CO	24 (25.0)	4 (28.6)	3.0	0.14 (0.00 to 2.8)	0.08
	Nurse	33 (34.4)	10 (71.4)	5.3	0.08 (0.00 to 1.5)	0.02
PMTCT Training	Yes	62 (64.6)	2 (14.3)	13	11 (2.3 to 52)	**<0.01**
	No	34 (35.4)	12 (85.2)		0.09 (0.01 to 0.43)	**<0.01**

3.6 Knowledge of the recommended intrapartum methods of PMTCT

Among the healthcare workers that were knowledgeable of intrapartum methods of PMTCT, minimising vaginal examinations (87.5%), discouraging prolonged labour (85.7%), and

immediate cord clamping (81.3%) were the most known protocols. Knowledge of aseptic delivery (70.8%) and avoiding trauma (72.9%) was moderate, while only 35.4%, 27.1%, and 25.0% of respondents knew about cleaning neonates, vaginal cleaning, and offering elective caesarean sections before onset of labour to patients who qualify, as far as PMTCT is concerned (Table 3.5)

Table 3-5: Knowledge of the recommended intrapartum methods of PMTCT

	Frequency (n=110)	Percent (%)
Minimising vaginal examinations	84	87.5
Discouraging prolonged labour	84	87.5
Artificial rupture of membranes	68	70.8
Elective CS before labour	24	25.0
Avoid trauma	70	72.9
Aseptic delivery	68	70.8
Immediate cord clamping	78	81.3
Avoid cord milking	64	66.7
Vaginal cleansing	26	27.1
Avoid suctioning	44	45.8
Covering cord	50	52.1
Cleaning neonate	34	35.4

3.7 Knowledge of the recommended intrapartum methods of PMTCT by gender

Of the 96 respondents that knew about intrapartum methods for PMTCT, gender of participants influenced the knowledge of the proposed methods. Even though the knowledge of minimising vaginal examinations (X2=2.2, p=0.18) and knowledge of discouraging prolonged labour (X2=0.28, p=0.55) did not vary significantly by gender, knowledge of vaginal cleansing as a method of PMTCT was eight times higher among women than males (OR (95% CI) = 8.0 (1.75-3.6), p=0.00). Five times more women than men also knew of avoiding suctioning (OR (95% CI) = 5.4 (1.9-15.0), p=0.00). Knowledge of avoiding trauma (p=0.08) and aseptic delivery (p=0.71) did not vary significantly by gender of respondents (Table 3-6).

Table 3-6: Knowledge of the recommended intrapartum methods of PMTCT by gender

	Gender				
	Female	Male	X2	OR (95% CI)	P
Minimising vaginal examinations	60 (90.9)	24 (80.0)	2.2	2.5 (0.7-8.5)	0.18
Discouraging prolonged labour	58 (87.9)	26 (86.7)	0.28	1.1 (0.3-4.3)	0.55
Artificial rupture of membranes	52 (78.8)	16 (53.3)	6.4	1.3 (0.5-2.8)	0.12
Elective CS before labour	20 (30.3)	4 (13.3)	3.1	2.8 (0.89-9.2)	0.08
Avoid trauma	52 (78.8)	18 (60.0)	3.0	2.5 (0.9-6.38)	0.08
Aseptic delivery	46 (69.7)	22 (73.5)	0.13	0.84 (0.3-2.2)	0.71
Immediate cord clamping	56 (84.8)	22 (73.5)	1.8	2.0 (0.71-5.8)	1.80
Avoid cord milking	48 (72.7)	16 (53.3)	3.5	2.3 (0.95-5.7)	0.06
Vaginal cleansing	24 (36.4)	2 (6.7)	9.2	8.0 (1.75-3.6)	**0.00**
Avoid suctioning	38 (57.6)	6 (20.0)	11.7	5.4 (1.9-15.0)	**0.00**
Covering cord	38 (57.6)	12 (40.0)	2.6	2.0 (0.9-4.9)	0.11
Cleaning neonate	26 (39.4)	8 (26.7)	1.5	1.8 (0.7-4.6)	0.23

3.8 Knowledge of the recommended intrapartum methods of PMTCT by experience

Experience influenced the knowledge of some intrapartum methods of PMTCT. Even though the knowledge of standard protocols such as minimising vaginal examinations (X2=5.1, p=0.15), discouraging prolonged labour (X2=4.5, p=0.21), and aseptic delivery (X2-9.4, p=0.25) did not vary significantly by experience of respondents; knowledge of elective CS was higher among individuals with a higher level of experience (3-4 years and 4+ years) than recent graduates (<one year) (X2=9.3, p=0.03). Knowledge of vaginal cleansing (X2=1.1, p=0.79) and covering cord (X2=1.6, p=0.66) did not vary significantly by experience of respondents (Table 3-7)

Table 3-7: Knowledge of the recommended intrapartum methods of PMTCT by experience

	Experience					
	<1	1-2	3-4	4+	X2	P
Minimising vaginal examinations	30 (82.2)	24 (80.0)	8 (80.0)	22 (100)	5.1	0.15
Discouraging prolonged labour	28 (82.4)	26 (86.7)	8 (80.0)	22 (100)	4.5	0.21
Artificial rupture of membranes	24 (70.6)	22 (73.3)	6 (60.0)	16 (72.7)	1.2	0.87
Elective CS before labour	6 (17.6)	4 (13.3)	4 (40.0)	10 (45.5)	9.3	0.03
Avoid trauma	22 (64.7)	22 (73.3)	8 (80.0)	18 (81.8)	2.3	0.57
Aseptic delivery	18 (52.9)	26 (86.7)	8 (80.0)	16 (72.7)	9.4	0.25
Immediate cord clamping	26 (76.5)	22 (73.3)	8 (80.0)	22 (100)		0.07
Avoid cord milking	18 (52.9)	22 (73.3)	10 (100)	14 (63.0)	6.8	0.05
Vaginal cleansing	8 (23.5)	8 (26.7)	4 (40.0)	6 (27.3)	1.1	0.79
Avoid suctioning	12 (35.3)	12 (40.0)	8 (80.0)	12 (54.5)	7.3	0.06
Covering cord	20 (58.8)	14 (46.7)	6 (60.0)	10 (45.5)	1.6	0.66
Cleaning neonate	10 (29.4)	12 (40.0)	2 (20.0)	10 (45.5)	2.8	0.42

3.9 Adherence to intrapartum obstetric methods of PMTCT of HIV 1 by health workers

Of the 110 healthcare worker/patient pairs interviewed, a majority (66.82%) did not adhere to the recommended intrapartum obstetric methods for PMTCT. Only 38.15% practiced nine or more of the recommended 12 PMTCT protocols (75%) during delivery (Figure 3-1).

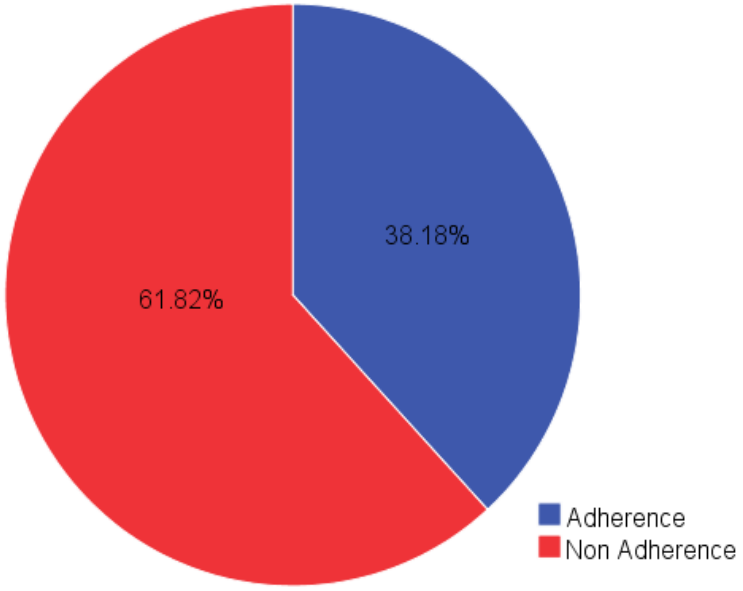


Figure 3-1: Adherence to intrapartum obstetric methods of PMTCT of HIV 1 by health workers

3.10 Adherence to intrapartum obstetric guidelines of PMTCT of HIV 1 by age, sex, education, qualification, and experience of heath care workers

The gender of health care workers on the other hand influenced adherence to intrapartum methods. More women than men adhered to the recommended protocols (OR (95% CI)) = (3.4 (1.4 to 8.3)), p=0.0072. Even though qualification and education level did not influence health worker' adherence to intrapartum protocols for PMTCT, a statistically significant relationship between the duration health workers spent in the maternity ward and adherence to PMTCT protocols was evident. Generally, participants who had spent one to two years in the maternity ward were 2.9 times more likely to adhere to the recommended intrapartum obstetric protocols than those who had spent less than one year in the labour ward (p=0.02). PMTCT training also influenced adherence to intra partum obstetric methods, with the odds of health worker adherence being 2.8 times higher among trained personnel (Table 3-8)

Table 3-8: Adherence to intrapartum obstetric guidelines of PMTCT of HIV 1 by age, sex, education, qualification, and experience of heath care workers

		Intrapartum Methods				
		Adherence	Non Adherence	X^2	(OR (95% CI)	P
Sex	Female	34 (81.0)	38 (55.9)	7.2	3.4 (1.4 to 8.3)	0.0072
	Male	8 (19.0)	30 (44.1)		0.3 (0.12 to 0.74)	0.0072
Education level	Tertiary	28 (66.7)	46 (67.6)	0.0	0.9 (0.42 to 2.2)	0.91
	University	14 (33.3)	22 (32.4)		1.0 (0.46 to 2.4)	
	Trainee Nurse	12 (4.8)	17 (25.0)		REFERENCE	
Qualification	MO	6 (14.3)	14 (20.6)	0.6	0.6 (0.18 to 2.0)	0.81
	CO	16 (38.1)	12 (17.6)	1.4	1.9 (0.66 to 5.4)	0.20
	Nurse	18 (42.9)	25 (36.8)	0.0	1.0 (0.39 to 2.7)	0.91
Time in maternity	<One year	20 (47.6)	44 (64.7)		REFERENCE	
	1-2 Years	16 (38.1)	12 (17.6)	5.5	2.9 (1.2 to 7.3)	0.02
	3-4 Years	4 (9.5)	6 (8.8)	0.3	1.5 (0.37 to 5.8)	0.58
	4+ Years	2 (4.8)	6 (8.8)	0.13	0.7 (0.14 to 4.0)	0.72
PMTCT Training	Yes	24 (57.1)	22 (32.4)	6.6	2.8 (1.3 to 6.2)	**0.01**
	No	18 (42.9)	46 (67.6)		0.36 (0.16 to 0.79)	**0.01**

3.11 Observed intrapartum obstetric methods of PMTCT of HIV 1 by health care workers

A majority of health workers practiced standard protocols such as minimising vaginal examinations (87.3%), discouraging prolonged labour (87.3%), and immediate cord clamping. Aseptic delivery (70.9%) and avoiding artificial rupturing of membranes (70.9%) were also common. Unfortunately, only 34.5%, 29.1%, and 27.3% of healthcare workers cleansed neonates, cleansed vaginas with antiseptics after rupture or membranes, and presented women with the option of elective caesarean section (CS) before onset of labour.

Table 3-9: Observed intrapartum obstetric methods of PMTCT of HIV 1 by health care workers

	Frequency (n=110)	Percent (%)
Minimised vaginal exam	96	87.3
Discouraged prolonged labour	96	87.3
Immediate cord clamping	90	81.8
Avoiding unnecessary trauma during delivery	80	72.7
Avoided rupture of membranes	78	70.9
Aseptic delivery	78	70.9
Avoided cord milking	76	69.1
Covered placenta when cutting	60	54.5
Avoided suctioning	56	50.9
Cleansed neonates	38	34.5
Vaginal cleansing	32	29.1
Elective CS before labour	30	27.3

3.12 Qualitative Data Results

The qualitative data was obtained from six FGDs with six groups of HCWs providing delivery services in the Mbagathi Hospital labour ward. The second data set consisted of key informant interviews done on key stakeholders at Mbagathi District Hospital responsible for staffing and supervision of HCWs while in charge of provision of maternity in the same labour ward. The FGD with the health care providers explored the barriers to adherence to the PMTCT protocol used in provision of PMTCT services at Mbagathi District Hospital.

Interviews with the key informants explored system or facility barriers to utilization of intrapartum obstetric PMTCT services.

3.12.1 Heavy Workload

This was the most frequent reason given by HCWs as a barrier to proper protocol utilization. They partly blamed this on the advent of the free maternity services currently offered in all public medical facilities.

" the work is too much considering the number of deliveries we conduct per nurse per day….therefore at times we are not able to follow the protocol as needed like when it comes to utilization of aseptic techniques for all deliveries" Nurse in labor ward

"we depend on assistance of these nursing students because of the heavy work. Some of them are unaware of the PMTCT protocol and with the workload here at times we are not able to supervise and teach them" Clinical officer intern in labor ward

3.12.2 Inadequate Staffing

This was also reported by theHCWs as one of the reasons for not being able to adhere to the intrapartum PMTCT protocols. They rely on nursing students for assistance. The key informants also raised this issue.

"most times one nurse has to monitor and deliver 6-8 patientsin a day. This makes it difficult for us to provide optimal care and more so when the student nurses who assist as a lot are away on holiday. There are times we have had patients sustaining pelvic floor tears and other complications due to delivering without any nursing assistance" Nurse stationed in labor ward

3.12.3 Patient Complications

The HCWs also reported that this was one of the challenges they face as they try to implement the PMTCT protocol.

"When a patient undergoes some obstetric complications we are left with no option but to stop following the protocol e.g. when a patient has poor progress of labor we at times perform artificial rupture of membranes to accelerate the labor process" Clinical officer stationed in labor ward

"I have once had to conduct a delivery without following the aseptic technique because the patient had precipitate labor" Medical officer intern

3.12.4 Lack of Training in PMTCT and Supervision

From the qualitative data analysis, it was revealed that most of the HCWs based in the labor ward have not undergone any form of training in PMTCT. They reported that they only practice what they see on the 'PMTCT protocol chart' hanged in the delivery room of which they termed some of its components as vague.

"We have a major challenge on PMTCT training. Most of us have never been sponsored by this facility for these trainings and updates on PMTCT.What is on this chart is not adequate as no one has explained to us what is meant by for example 'minimizing VEs' and how minimizing the risk of PPH helps in PMTCT" Nurse stationed in labor ward but has never undergone training in PMTCT

"I went fortraining on PMTCT but the concentration was mainly on use of ARVs and infant feeding with very little emphasis on intrapartum methods of PMTCT" Nurse stationed in labor ward who has undergone training on PMTCT

3.12.5 Lack of Adequate Facility Resources

This also emerged as a barrier to adherence to the intrapartum PMTCT protocol and was raised by both the HCWs and key informants. They reported that at times they are not able to offer elective caesarian sections to HIV positive pregnant women with high viral loads because the theatre is at those times occupied with other emergency obstetric cases.

CHAPTER FOUR

4 DISCUSSION, CONCLUSION AND RECOMMENDATIONS

4.1 Main Findings

Majority of HCWs at Mbagathi district hospital labour ward have knowledge on PMTCT although less than half have undergone training on the same. Most of them have knowledge on the ARV protocol and on infant feeding aspects of PMTCT but a slightly lower proportion have knowledge on the recommended intrapartum obstetrics methods of PMTCT.

Knowledge of intra-partum obstetric protocols of PMTCT does not vary significantly with ages of HCWs at this facility. PMTCT training has influence on their knowledge of the protocols with knowledge being 11 times higher among the HCWs who have undergone PMTCT training. Most of the HCWs have knowledge on minimizing vaginal examinations, discouraging prolonged labour and immediate cord clumping. There is least knowledge on cleansing of neonates, vaginal cleansing, and offering of elective CS before onset of labour.

Knowledge of some of the various aspects of intrapartum methods of PMTCT varies with the education level of the HCWs with university graduates being more knowledgeable on most of the aspects as compared to other cadres. HCWs who have more experience working in labour ward are more knowledgeable on the various aspects of intrapartum methods of PMTCT except on the aspect of vaginal cleansing and covering the cord while cutting where there is no significant variance in knowledge.

A majority of HCWs also do not adhere to the recommended intrapartum obstetric PMTCT protocol. Adherence to the protocol was significantly influenced by the level of education of the HCWs, the duration the HCW has spent stationed in the labour ward andrecent history of training in PMTCT.

The findings of this study indicates that majority of HIV positive pregnant women are offered suboptimal care (61.82%) with a complete package of interventions that have been shown to effectively reduce vertical transmission of HIV. This correlates with a previous study done in KNH and Pumwani Hospital in Nairobi, Kenya. (27). The PMTCT program is thus still not as effective and responsive as it needs to be (28). Of note, compared to other aspects of PMTCT, knowledge of intrapartum obstetric methods of PMTCT was found to be lower. This was as in two other studies conducted in Tanzania (29, 30).

Of the various components of intrapartum obstetric methods of PMTCT, this study established that majority of HCWs practised minimizing vaginal examinations (87.3%), discouraging prolonged labour (87.3%), immediate cord clumping (81.8%), avoiding unnecessary trauma during delivery (80%), use of aseptic techniques during delivery (70.9%) and avoiding artificial rupture of membranes (70.9%). The rest of the interventions are not well known to the HCWs. The reason for this selectivity may be due to the little emphasis of these components as noted on the Ministry of Health protocol chart displayed in the delivery room. Some of these components are not even mentioned in the protocol. Offering of elective caesarean section before onset of labour was found to be dependent on availability of theatre space and patient choice.

Adherence to intrapartum obstetric guidelines did not vary significantly by the age of the HCWs. However, the gender and education level influenced the HCWs adherence to the protocol. PMTCT training was also noted to have a major influence on adherence to these protocols with odds of HCW adherence being 2.8 times higher among trained personnel. This was also seen in a study done in Tanzania (31) which also revealed that PMTCT training and the length of training influenced HCWs adherence to the protocol.

The Kenya National AIDS Strategic plan 2000-2010 has set adherence to set clinical standards as one of its priority areas in order to provide quality care to HIV positive citizens and to minimize the numbers of new infections. This study was conducted to evaluate one of the strategies of PMTCT offered to patients attending maternity services at Mbagathi District Hospital. It was carried out to assess knowledge and adherence to the set intrapartum methods of PMTCT protocol and to establish barriers to adherence. HCWs are at the cornerstone for implementation of these studies. However, some health facility factors were identified during this study that is a barrier to adherence. This unfortunately led to 61.82% of patients receiving sub-optimal care concerningintrapartum methods of PMTCT.

The facility-associated barriers leading to low adherence to these protocols were a recurrent theme during the FDGs and KIIs. They mentioned staff shortages and heavy workload as the main reasons for non-adherence. It was established that low pay was one of the main causes of staff shortages as many of the HCWs in the facilities have resigned to seek employment in the private sector, which offers better pay, and adequate resources enabling them perform their duties more comfortably. The staff shortage has been compounded by heavy workload, which has come about because of free maternity care services offered by the government in public facilities. This has seen a rise in patient numbers seeking maternity services in these facilities.

The incorporation of nursing students in the maternity ward is a double edge sword, which while relieving the nurses off the heavy workload and in the end increasing the human resource pool in the Kenyan health sector, the students working in labour ward without adequate supervision may be contributing to more harm than good.

Lack of training on PMTCT was also noted as a major hindrance on the HCWs knowledge and adherence to the intrapartum PMTCT protocol.Unavailability of the theatre services every time when needed was also a major facility barrier.

4.2 Conclusion

Knowledge of intrapartum obstetric methods of PMTCT was high (87.3%) among the HCWs stationed in the Mbagathi District Hospital labour ward. However, adherence to this protocol was poor since only 38.18% of HIV positive patients who delivered at the facility during the study period were offered optimal care. This could be due to lack of training on PMTCT and use of trainee nurses in the delivery unit with inadequate supervision.Overwhelming workload, staff shortages, lack of PMTCT training, patient complications and lack of sufficient facility resources were the main reasons for poor adherence to these protocols.

4.3 Recommendations

Based on our findings, we would like to recommend the following:

- Training of HCWs stationed in the labour ward on all aspects of PMTCT. This will increase their knowledge and improve adherence to these protocols
- Improved staffing – more nurses and medical officers need to be employed to ease the workload as well as aid in supervision of the trainees who are involved in assisting with duties in this department as part of their training
- Supervision by consultants and senior medical officers and nurses needs to be improved to enhance foreseeing and mitigating patient complications as well as passing of these skills to the juniors
- A second theatre needs to be built or the referral system improved to help handle increased number of obstetric emergencies handled by this facility so that all HIV positive patients who qualify for delivery via caesarean section are offered this option

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CONSENT FOR STUDY PARTICIPATION

Knowledge of and Adherence to the Recommended Intrapartum Obstetric Guidelines for PMTCT of HIV-1 by Health Workers at Mbagathi District Hospital, Nairobi

Study Investigators
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Investigator's Statement
We are asking you to be in this study. The purpose of this consent form is to give you the information you will need to help you to decide whether to be in this study or not. Please read this form carefully. You may ask questions about the purpose of the research; what we would ask you to do; the possible risks and benefits; your rights as a volunteer; and anything else that is not clear. When we have answered all your questions, you can decide if you want to be in the study or not. We will give you a copy of this consent form for your records.

Purpose of the Study
The aim of this study will be to determine your knowledge of the recommended intra-partum protocols for PMTCT for HIV-1, adherence to these protocols, and factors that fuel non-adherence. We aim to enroll 96 health worker and patient pairs to meet these goals.

Study Procedures
This is what will happen if you agree to participate in this study: a trained research assistant will you questions about your knowledge of PMTCT. If you agree, he or she will also will also monitor how you handle your patients from labor to delivery and take notes.

Risks, Stress, and Discomfort
This study poses minimal risks. No blood samples or lab tests are required. The only cost will be the time necessary to complete the interview. We may not ask any sensitive questions that may cause embarrassment or psychological harm.

Even though there is no physical harm that will come from participating in the study, you might feel uncomfortable answering some questions. The research assistant will monitor, evaluate, and immediately review any safety concerns that arise during the interview process.

Benefits of the Study
Even though you will not benefit financially from this study, its result will help to improve the level of care provided to HIV positive mothers visiting this facility.

Confidentiality
Interviews will take place in a private space that you will suggest. No personal information will be shared by anybody else apart from other researchers. All documents will be locked in a cupboard for safe storage.

Problems and Questions

If you ever have any questions about this study, you should contact Dr. Robert UlaloAbade by dialing……
If you have questions about your rights as a participant, contact the secretary, Ethical Review Committee (ERC) at Nairobi University by dialing…….. and or writing to……

Subject's Statement

I am providing consent for participation in this study. I have read this form or had it read to me. I have also discussed the information with study staff and all my questions answered. If I decide to join this study, I may withdraw at any time. By signing this form, I do not give up any rights I have as a participant.

……	……	……
Printed name of subject	Signature of subject/thumb print	Date
……..	…….	……
Printed name of witness (for illiterates)	Signature	Date

5 APPENDICES

Appendix 1: Questionnaire

Section A: Healthcare worker's characteristics
Table on Social Demographic Information of Participant

HCW CODE

Age group (years)
20–24☐
25–34☐
≥35 ☐

SEX
Female ☐
Male ☐

Education
None ☐
Primary ☐
Secondary ☐
Tertiary ☐
University ☐

Marital Status
Single ☐
Married -
Monogamous ☐
- Polygamous ☐
Divorced ☐
Separated ☐

Religion
Catholic ☐
Protestant ☐
Anglican ☐
Muslim ☐
Hindu ☐
Others ☐

Qualification of Health worker OBGY ☐ MO☐ CO ☐ Nurse ☐ Trainee nurse☐
Duration since qualification …….Months ……..Years
Duration since deployment to maternity unit ……..Months …….Years
Are you aware of the principles of PMTCT? Yes ☐ No☐
If yes, tick the principles you are aware of.
Use of ARVS ☐
Modified intra-partum obstetric methods ☐
Exclusive breastfeeding/replacement feeding ☐
Have you attended PMTCT training? Yes ☐ No☐

Section B: Patient characteristics

Age in years …….

Marital Status

Single ☐
Married
- Monogamous ☐
- Polygamous ☐
Divorced ☐
Separated ☐

Gestation in completed weeks ……..

Parity
Primigravida☐
Para 1☐
Para 2☐
Para 3/>☐
Place of last delivery
Home ☐
Hospital ☐
TBA assisted ☐

Duration since HIV diagnosis ……..months …….years

Have you disclosed HIV status to your spouse? Yes ☐ No☐

Are using any contraceptives? Yes ☐ No☐

If yes, state which type …….

Enrolled in PMTCT care Yes ☐ No☐

Clinical staging of HIV/AIDS (WHO) 1☐ 2 ☐ 3 ☐ 4 ☐

Patient received counselling on safe delivery prior to labour Yes ☐ No☐

Appendix II: Observation Checklist

Tick where used appropriately

Local Protocol	
Minimizing vaginal examinations	☐
Discouraging prolonged labour	☐
Avoiding artificial rupture of membranes	☐
Elective CS before onset of labour (to patients who qualify for CS)	☐
Avoiding unnecessary trauma during delivery	☐
Using aseptic methods of delivery	☐
Others	
Immediate cord clumping	☐
Avoiding milking the cord	☐
Vaginal cleansing with antiseptic after rupture of membranes	☐
Avoiding routine suctioning of the baby	☐
Covering the cord while cutting	☐
Cleansing of neonate soon after delivery	☐

APPENDIX III: KEY INFORMANT INTERVIEW GUIDE

Good morning. My name is Dr Robert Abade and I am a postgraduate student currently conducting a study that will help to determine the healthcare workers' knowledge of the recommended intra-partum protocols for PMTCT for HIV-1, adherence to these protocols, and factors that fuel non-adherence at the Mbagathi District Hospital labor ward. The aim of this interview is to identify the reasons as to why these protocols are not followed as recommended and to get your suggestion on what can be done to improve their uptake. I will be recording the discussions and therefore I will request that you allow me to guide the discussions. I assure you of confidentiality.

Would you like to participate in this interview?

Verbal consent: yes or no.

Respondent information:

Title: Introduction

1. Do you have any challenges as an institution that you are facing in the implementation of the intra-partum PMTCT protocols? Explain.
2. Is the cost of implementation a challenge? Explain
3. Is there consistency of supplies and availability of equipment needed for full implementation of the said protocols? Explain
4. Do you have adequate staff with skills and knowledge with regard to providing adequate PMTCT protocols and handling of the workload at your facility? Explain
5. What are your recommendations or suggested solutions in addressing this problem?
6. Is there any more information you would like to add?

Thank you for accepting to participate in the interview.

Do you have any one in mind that can participate in this study?

APPENDIX IV: FOCUSED GROUP DISCUSSION GUIDE

Good morning. My name is Dr Robert Abade and I am a postgraduate student currently conducting a study that will help to determine the healthcare workers' knowledge of the recommended intra-partum protocols for PMTCT for HIV-1, adherence to these protocols, and factors that fuel non-adherence at the Mbagathi District Hospital labor ward. The aim of this interview is to identify the reasons as to why these protocols are not followed as recommended and to get your suggestion on what can be done to improve their uptake. I will be recording the discussions and therefore I will request that you allow me to guide the discussions. I assure you of confidentiality.

Would you like to participate in this interview?

Verbal consent: yes or no.

Respondent information:

Title: Introduction

1. What is your perception about intra-partum methods of PMTCT? Do you think it's an important aspect of PMTCT?
2. Are there any challenges you face in the implementation of the intra-partum PMTCT protocols? Explain.
3. Is there consistency of supplies and availability of equipment needed for full implementation of the said protocols? Explain
4. Do you have adequate staff with skills and knowledge with regard to providing adequate PMTCT protocols and handling of the workload at your facility? Explain
5. What are your recommendations or suggested solutions in addressing this problem?
6. Is there any more information you would like to add?

Appendix V: Budget

Position/Item	Cost(Kshs)	Time/Unit Cost	Duration
Statistician	30,000	20%	1 month
Research assistants (2)	20,000	40%	4 months
Data clerk	8,000	10%	1month
Type- setting, printing, Binding	20,000	10%	1 month
Printing papers	5,000		
Other stationaries	5,000		
Writing Materials	2000		
Travel Cost	10,000		
Miscellaneous	5,000		
TOTAL	105,000		