SCHOOL OF PUBLIC HEALTH

COLLEGE OF HEALTH SCIENCES

UNIVERSITY OF GHANA, LEGON

INDICATIONS, COMPLICATIONS AND OUTCOMES OF HYSTERECTOMY AT KORLE BU: A FIVE YEAR REVIEW

BY

CHARLES TAKYI

(10395270)

THIS DISSERTATION IS SUBMITTED TO THE SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF GHANA IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE MASTER OF PUBLIC HEALTH (MPH) DEGREE.

JULY, 2013

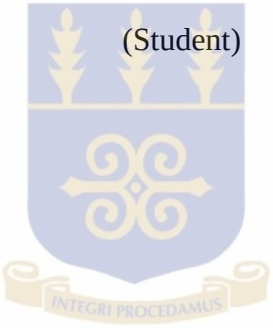
DECLARATION

I hereby declare that apart from specific references which have duly been acknowledged, this research proposal is my own work put together.

_____

Charles Takyi

(Student)



_____

Professor Richard M. K. Adanu

(Supervisor)

DEDICATION

I dedicate this work to the almighty God through whose grace I am alive to present this dissertation. My dear wife, Mrs. Yvonne Takyi and my family need a special mention for their support during my entire Master of Public Health programme.

ACKNOWLEDGEMENT

I thank the teaching staff of the School of Public Health, University of Ghana especially my lecturers for their guidance and support during the Master of Public Health programme.

A special mention goes to my supervisor, Professor R. M. K Adanu for his support and constructive criticism for the successful completion of this project.

The Head of Department of Obstetrics and Gynaecology at the Korle bu Teaching Hospital, Professor S.A Obed and his unit heads need special mention for their support during the data collection period.

I am immensely grateful to Professor Gyasi, Head of Department of Pathology at the Korle bu Teaching Hospital for his personal support in providing histopathology diagnosis for the study.

Mr. J. Abledu, Rev. Tom Ndanu, Maxfield Okere, and Edward Essuman should be mentioned for their various contributions during the data collection, entry and analysis of my research.

I acknowledge all persons who helped in diverse ways to make this project a success.

ABSTRACT

Background: Hysterectomy, the surgical removal of the uterus, is a frequently performed gynaecological surgical procedure worldwide. However, hysterectomy is associated with some complications and in a few instances fatal consequences. A woman after hysterectomy loses her reproductive ability, the ability to menstruate, in addition to a few minor complications and occasional major complications.

Setting: This study was done at the department of Obstetrics and Gynaecology of the Korle bu Teaching Hospital (KBTH), in Accra, Ghana.

Objective: The objective of the study was to determine the prevalence, complications and outcomes of hysterectomy at the KBTH from January 1, 2008 to December 31, 2012.

Methods and materials: Study included all women who had hysterectomies at the department of Obstetrics and Gynaecology within the five year period. Data were collected with the help of a specially designed data capture sheet. Frequency tables and charts were used to summarize data. Stata version 11 was used to analyze data using Chi-square test, simple and multiple logistic regressions.

Results: Over the five year period under review, a total of 2,090 hysterectomies were recorded. The prevalence of hysterectomy at the department was 7.8%. The leading indication for hysterectomy was uterine fibroids (67.3%). A total of 370 women had surgical complications. About 13% of cases had only one complication, 3% had two complications and 2% had three or more complications. More than half of Hysterectomy cases (69.1%) spent on average less than five days at the hospital after surgery. Hysterectomy was effective for symptom relief in 97% of cases. The risk of developing a

surgical complication was reduced in hysterectomy for gynaecologic indications (aOR; 0.1; 95% CI (0.0-0.3); p-value<0.001) compared to hysterectomy for obstetric complications.

Conclusions: Total abdominal hysterectomy was the predominant surgery at the department. Although hysterectomies were associated with some complications, the general outcomes of hysterectomy were favourable.

Key words: Hysterectomy, Complication, Uterine fibroid, Haemorrhage.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

KBTH	Korle bu Teaching Hospital
TAH	Total Abdominal Hysterectomy
VH	Vaginal Hysterectomy
SAH	Subtotal Abdominal Hysterectomy
TLH	Total laparoscopic hysterectomy
LAVH	Laparoscopic Assisted Vaginal Hysterectomy
LAP	Laparoscopy
MO	Medical Officer
IUS	Intrauterine System
I	Principal Investigator
WMD	Weighted Mean Difference
GHS	Ghana Health Service
CDC	Centers for Disease Control and Prevention

DEFINITION OF TERMS

Hysterectomy: A surgical procedure for the removal of the uterus.

Indication: Diagnosis leading to surgery.

Complication: An unfavorable evolution of a disease, a health condition or a therapy.

Outcome: An end result or a consequence of a surgical procedure. It may be good or bad.

Co-morbid: Medical conditions other than the diagnosis leading to a Hysterectomy.

Peripartum: The period around delivery of a baby (before labour, during labour and after labour).

Peri-operative: The period around surgery (before surgery, during surgery and after surgery).

Grandmultipara: A woman who has had five (5) or more deliveries.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the Study

Hysterectomy is the surgical removal of the uterus (womb) and is the most frequently performed major gynaecological surgical procedure with millions of procedures performed annually throughout the world (Johnson et al., 2005). Hysterectomy can be performed for benign and malignant indications. Approximately 90% of hysterectomies are performed for benign conditions, such as fibroids causing abnormal uterine bleeding (Flory, Bissonnette, & Binik, 2005).

At the Korle bu Teaching Hospital, hysterectomy is amongst the top three surgical procedures at the department of Obstetrics and Gynaecology; the other two being caesarean sections and myomectomies. Although some studies on hysterectomies have been done in the past, which includes Peripartum hysterectomies (Kwame-Aryee, Kwakye, & Seffah, 2010) and hysterectomy for uterine fibroids in nullipara (Seffah & Adanu, 2006), no comprehensive study has been done in the hospital taking into account all hysterectomies done at the department.

Hysterectomy is highly effective for relief of symptoms associated with common nonmalignant gynecologic conditions. Symptom relief following hysterectomy is associated with a marked improvement in quality of life. It is also noted that satisfaction

rates after hysterectomy is over 90%(Carlson, 1997). However, hysterectomy is associated with some complications and in a few instances fatal consequences. A woman after hysterectomy loses her reproductive ability, the ability to menstruate(except some cases of subtotal hysterectomy), in addition to

a few minor complications and occasional major complications.

The aim of this study is to determine the common indications, complications and outcomes of hysterectomies done at the Korle bu teaching hospital during the study period (January 1, 2008 - December 31, 2012).

Established in October 9, 1923, the Korle bu Teaching Hospital has grown from an initial 200 bed capacity to 2,000. It is currently the third largest Hospital in Africa and the leading national referral centre in Ghana (Annual Report of KBTH, 2010). The Korle bu Teaching Hospital is located in the Ablekuma South district of the Greater Accra region in Ghana. Due to the specialist service provided by this facility, it sub serves a wider population beyond its environs. The KBTH gained a teaching hospital status in 1962 when the University of Ghana Medical School (UGMS) was established for the training of medical doctors. Currently, the Hospital has 2,000 beds and 17 clinical and diagnostic departments/units of which the study setting (Obstetrics and Gynaecology Unit) is a major part. It has an average daily attendance of 1,500 patients and about 250 patient admissions.

On the average, over 20,000 surgical operations are performed annually at the KBTH of which over 60% are major operations.(Annual Report of KBTH, 2010)

In the year 2010 alone, a total of 5,144 major surgical operations were done in the department of Obstetrics and Gynaecology out of the overall total of 20,335 surgeries done at the KBTH that year.

1.2 Problem Statement

Hysterectomy is known to be responsible for an overall morbidity rate of 6.1% (Kafy, Huang, Al-Sunaidi, Wiener, & Tulandi, 2006). In an audit of morbidity and mortality rates of 1792 hysterectomies, the incidence of re-laparotomy was 0.4%, urinary retention and haematoma formation were common with vaginal hysterectomy and incidence of bowel injury and bladder injury were (0.3-0.4%) and (0.1-0.9%) respectively.

The mortality rates for hysterectomy, standardized for age and race is higher for procedures associated with pregnancy or cancer than for procedures not associated with these conditions (29.2, 37.8, and 6.0 per 10,000 procedures, respectively). The mortality rate associated with hysterectomy increases with age and is twice as high among black women (Wingo, Huezo, Rubin, Ory, & Peterson, 1985). Peripartum hysterectomy is accompanied by substantial morbidity and mortality. Compared with non-obstetric hysterectomy, the procedure is associated with increased rates of both intra-operative and post-operative complications. The mortality of peripartum hysterectomy is more than 25 times that of hysterectomy performed outside of pregnancy(Wright et al., 2010). The adjusted mortality rates for abdominal (0.20%), laparoscopic (0.03%), robotic (0.07%), and vaginal (0.04%) hysterectomies(DuBeshter, Angel, Toy, Thomas, & Glantz, 2013)

On average about two (2) hysterectomies are done on a daily basis in the Obstetric and Gynaecology unit of the KBTH. Hysterectomies account for 1 in 5 major cases done in the unit and second only to Caesarean sections by way of number of major cases done at the department of Obstetrics and Gynaecology of the KBTH (Annual report of KBTH, 2010).

Although hysterectomy is a major gynaecological surgical procedure done at the department of Obstetrics and Gynaecology of the Korle bu Teaching Hospital, very little is known about its common indications, complication rates during surgery and after surgery, as well as the short term outcome of the procedure in the hospital. The incidence of emergency peripartum hysterectomy is about 4.34 per 1,000 deliveries; which is a study done about ten years ago and is not reflective of current total hysterectomy rates in the unit (Kwame-Aryee et al., 2010)

1.3 Justification

From literature, it is known that outcomes and complications following hysterectomies are influenced by parity, uterine size, type of hysterectomy, level of surgical expertise, co-morbid medical factors, prior surgical history (adhesions) and indication (diagnosis) before surgery.

It is therefore imperative that the practice of hysterectomy is reviewed in all institutions which carry out this important surgical procedure to guide practice. A review of hysterectomies enables clinicians to adjust to current modalities in the management of similar conditions other than the use of hysterectomy alone. A comprehensive study on hysterectomies will help provide rates and vital information to enhance scientific knowledge. With such a high prevalence, it is essential that the effects of hysterectomy are reviewed periodically. This is particularly important at this time when a number of potentially effective therapeutic alternatives have been developed (Ingelsson, Lundholm, Johansson, & Altman, 2011).

1.40 Objectives

1.41 General

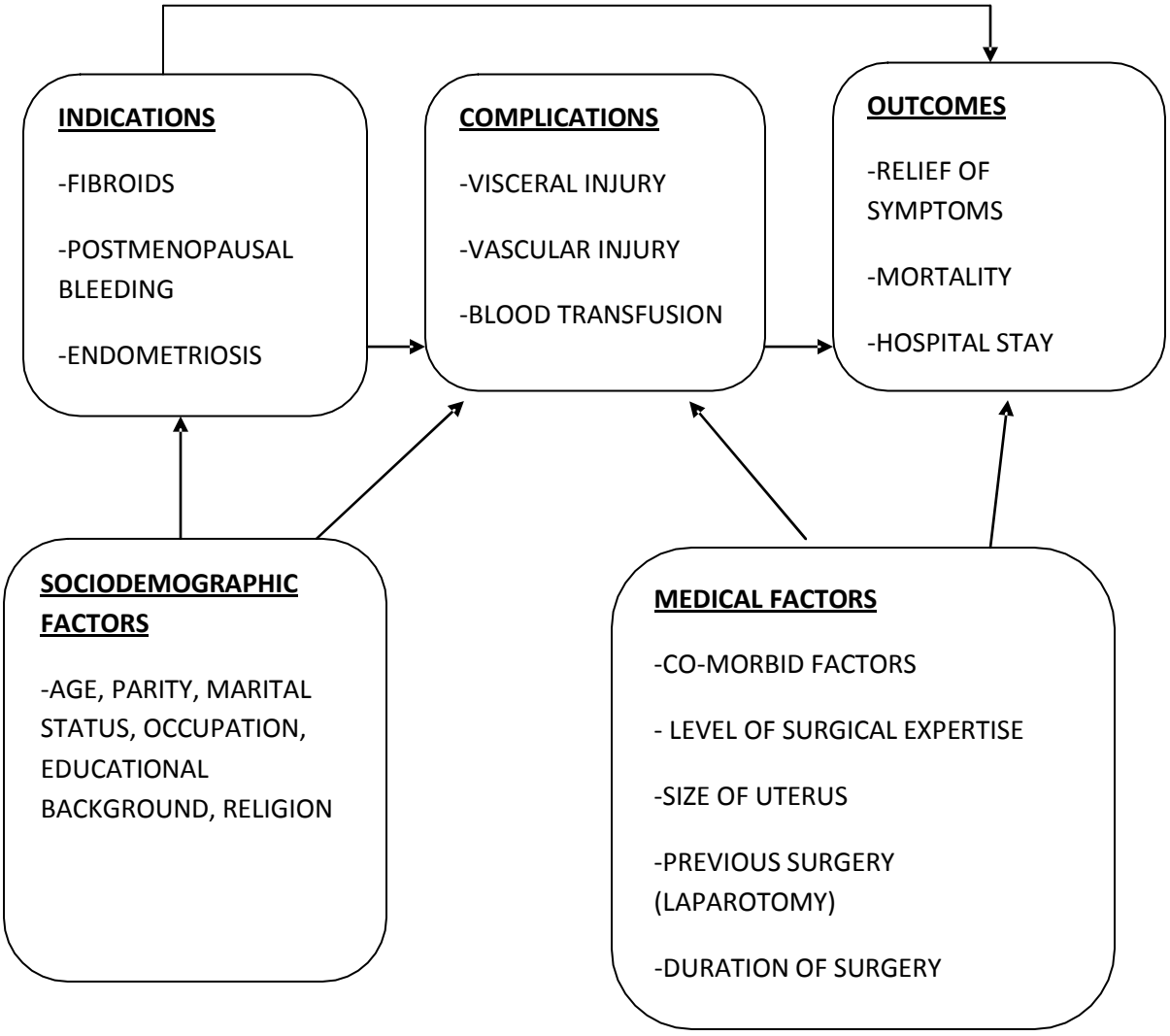
To determine the Prevalence, Complications and Outcomes of Hysterectomy in Patients at the Korle bu Teaching Hospital from January 1, 2008 to December 31, 2012.

1.42 Specific

1. To determine the prevalence of hysterectomy at the Korle bu Teaching Hospital K.B.T.H.
2. To determine the indications for hysterectomies performed at K.B.T.H.
3. To determine the complications associated with hysterectomies performed at K.B.T.H.
4. To assess factors associated with clinical outcomes of hysterectomies at the K.B.T.H.

1.5 Conceptual Framework

Figure 1:



This conceptual framework depicts the interplay of indications, complications and outcomes of hysterectomy and how these factors can also be influenced by medical and socio-demographic factors. A typical example is a patient with two previous caesarean section and uterine fibroids at hysterectomy will have an increased risk of injury to

bladder or ureter and haemorrhage leading to a poorer outcome compared to someone with no surgical history prior to hysterectomy. This may be explained by the presence of adhesions which could lead to difficult surgery in the former. In a similar fashion, the type of indication can influence the outcome and may predispose a client to complications. In this scenario, a huge uterine fibroid at hysterectomy may predispose the client to complications and bad outcome compared to smaller size uterine fibroids.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 BACKGROUND OF HYSTERECTOMY

The first planned, successful vaginal hysterectomy (VH) was performed by Conrad Langenbeck in 1813 (Surendran, 2011). After unsuccessful attempts by surgeons Clay and Heath; the first successful abdominal hysterectomy was performed in 1853, probably by Walter Burnham. Later the same year, Gilman Kimball described the first successful subtotal abdominal hysterectomy (SAH) for fibroids under chloroform anaesthesia. During the next 100 years or so, these techniques were refined and equipment improved but there were no further conceptual advances in technique until the works of the laparoscopic surgical pioneer Kurt Semm of Germany and Harry Reich from the USA (Garry, 2004).

Over 550,000 women in the USA undergo hysterectomy every year at a total cost exceeding USD 5billion. In the United Kingdom, the figure is over 100,000 hysterectomies per year, 60,000 per year in France, 30,000 per year in Australia, and 5,000 per year in Denmark. This indicates that hysterectomy is a frequently done surgical operation in most countries. However there are differences in prevalence of hysterectomies between countries ranging from the highest of 5.4 per 1000 women in the USA, through an intermediate of 3.7 per 1000 women in Italy to a low of 1.2 per 1000 women in Norway. In spite of the introduction of alternatives to hysterectomy in recent times, its rate has remained relatively stable in most countries (Garry, 2004).

From recent surveillance data by the CDC (Centres for Disease Control), Hysterectomy is the second most frequent surgical procedure in American women 15-49 years surpassed only by Caesarean sections (Vesco et al., 2012). Hysterectomy rates in the USA are the highest amongst industrialized nations accounting for over 5.5 per 1,000 women who undergo the procedure every year. Hysterectomy is associated with short and long term complications irrespective of the surgical technique used. Therefore all women considering hysterectomy should know the risk factors associated with the procedure to make an informed choice on the best treatment option (Grundy, 2006).

A cross-sectional review of hospital records in Australia between 2000 and 2005 revealed a drop in hysterectomy rates from 34.8 per 10,000 women in 2000/01 to 31.2 per 10,000 women in 20004/05 (Hill, Graham, & Shelley, 2010).

There is paucity of data on national hysterectomy rates in most developing countries including Ghana, however a study done on peripartum hysterectomies covering the period January 1, 2000 to June 30, 2003 at the Maternity Unit of the Korle bu Teaching Hospital showed the incidence of peripartum hysterectomy during the study period was 4.34/1000 deliveries (Kwame-Aryee et al., 2010).

A landmark study that compared surgical rates in Africa and the western world titled 'Surgical rates in Africa: Variations and their possible explanations', concluded that African rates of major surgery appear to be at least 20 times lower on the average than that of the western nations. This study looked at herniorrhaphy, caesarean section, prostatectomy, hysterectomy, appendectomy and lens operations in selected rural parts of Kenya and Tanzania (Holmberg & Nordberg, 1990).

In a study done at the University of Benin Teaching Hospital in Nigeria titled Obstetric hysterectomy: Fifteen years' experience in a Nigerian Tertiary Centre (January 1986- December 2000), the incidence of hysterectomy was 0.226%. In the same study, incidence was noticed to increase with increasing maternal age 0.10% at 20years to 0.706% at 40years and beyond. Also incidence of hysterectomy was noticed to rise with increasing parity from 0,028% for nulligravida to 1.298% for grandmultiparous women (Okogbenin, et al., 2003). In another

retrospective review of hospital records at the King Edward VIII Hospital in Durban, South Africa (January 1993-December 1998), the peripartum hysterectomy rate was 1:836 deliveries (Sebitloane & Moodley, 2004).

Generally, hysterectomy rates are relatively lower in most developing countries compared to the developed countries.

2.2 TYPES OF HYSTERECTOMY

Depending on whether the uterus is going to be removed completely or partially, two methods of hysterectomy namely total and subtotal may be recognized. Abdominal hysterectomy has traditionally been used for gynaecological malignancies, when other pelvic disease is present (endometriosis, adhesions) or in enlarged uterus such as fibroids. The abdominal approach still remains a 'fallback option' when the uterus cannot be removed by other approaches. Vaginal hysterectomy was originally used for utero-vaginal prolapse but currently can also be used for menstrual anomalies in a

fairly normal uterine size. Vaginal hysterectomy is regarded as less invasive than abdominal hysterectomy (Johnson et al., 2005).

Currently, four (4) major types of hysterectomy are used globally. These are the abdominal, the vaginal, the laparoscopic approach and lately the robotic hysterectomy. Conservative alternatives to hysterectomy includes endometrial ablative techniques, medical therapy, the Mirena intrauterine system (IUS), uterine artery embolisation (UAE), focused ultrasound surgery and myomectomy (Sahana Gupta & Manyonda, 2011). Before the 1930's the standard type of hysterectomy was subtotal, leaving the cervix behind to decrease the risk of peritonitis and its attendant high mortality. This method has gradually been replaced by total abdominal hysterectomy due to the discovery of antibiotics, careful asepsis, blood transfusion and other medical and surgical advances. However, subtotal hysterectomy is still popular in most Scandinavian countries (Sutton, 2010). It is noted that over eighty percent of surgeons prefer the abdominal route for hysterectomy, however, overall postoperative complications are higher in abdominal surgery compared with the vaginal and laparoscopic groups (p value=0.001)(Bansal, Hiremath, Meenal, & Prasad, 2013).

Two major independent studies by Shao and Wong found a strong influence on the decision making process regarding the type of hysterectomy and these includes the surgeons expertise and a concomitant adnexal surgery. In this study it was again found that generalist gynaecologists preferred an abdominal hysterectomy or vaginal hysterectomy whilst non-generalist gynaecologists were more likely to perform a laparoscopic hysterectomy. Older patients above 50years are more likely to have a

vaginal hysterectomy than a laparoscopic hysterectomy and bigger uterine size usually undergo abdominal hysterectomy compared to vaginal hysterectomy for small uterine size (Shao & Wong, 2008).

Large prospective controlled trials and a Cochrane review have clearly shown that vaginal hysterectomy is the surgical route of choice for hysterectomy (Falcone & Walters, 2008). In common with the overall hysterectomy rate, the proportion of hysterectomies currently being performed by different approaches varies markedly across countries, within countries, and even between individual surgeons working within the same unit. The surgical approach taken at hysterectomy continues to depend upon the experience and biases of the surgeon (Neiboer, Johnson, & Barlow, 2006).

In spite of recent advances in surgery such as use of laparoscopy and robots for hysterectomy, the old approach of total abdominal hysterectomy is still common. This may be due to the steep learning curve involved in laparoscopy and the high cost of robotic surgical and laparoscopic equipments (Sutton, 2010).

2.3 INDICATIONS OF HYSTERECTOMY

Indication refers to the diagnosis leading to a medical/surgical intervention (in this instance hysterectomy).

Menorrhagia secondary to uterine fibroids and abnormal menstrual bleeding are two of the most common indications for hysterectomy worldwide (Bansal et al., 2013). Most indications of hysterectomy are based on experts' opinions instead of evidence from well-designed clinical trials (Grundy, 2006). The indications for abdominal or vaginal hysterectomy has changed little over the last decade, with uterine

leiomyomata (33%) and menstrual disorder (17%) being the most common, followed by prolapse (13%) and endometriosis (9%) (Falcone & Walters, 2008). According to Kawuwa and Mairiga, the commonest indications for hysterectomy includes uterine fibroids (63.3%), utero-vaginal prolapse (10.6%), ovarian tumor (8.9%) and dysfunctional uterine bleeding (1.1%)(Kawuwa, Mairiga, & Audu, 2012).

In a chart review of peripartum hysterectomies done between 1999 and 2000, the primary indications for hysterectomy were uterine atony (37%) and suspected placenta acreta (33%). This study concluded that abnormal placentation was the main indication for peripartum hysterectomy(Glaze et al., 2008).

Another cross-sectional review of the behavior risk factor surveillance survey database in the USA in 2004 looked at multiple socioeconomic exposures (education level, annual income and employment) on hysterectomy. After adjusting for confounders, women who had not graduated from high school had 1.75 times higher
odds (95% confidence interval, 1.68-1.83) of having a hysterectomy compared with women who were college graduates. Also women with a lower annual household income had 1.06 times odds (95% confidence interval, 1.02- 1.10) of having a hysterectomy compared with women of higher income and finally employment status had no effect on the odds of having a hysterectomy (Erekson, Weitzen, Sung, Raker, & Myers, 2009).

The indication for hysterectomy is usually many and varied and this can be seen from literature. The indication can influence the type of hysterectomy, and the complication/outcome of the surgery.

2.4 COMPLICATIONS/OUTCOMES OF HYSTERECTOMY

Complication refers to an unfavorable evolution of a disease, a health condition or a therapy (in this case hysterectomy), whilst an outcome is the end result or a consequence of a therapy. In this study of indications complications and outcome of hysterectomy in Korle bu, short term outcomes of hysterectomy were considered in terms of good outcomes and poor outcomes.

According to Stany and Farley (2008), complications during most gynaecologic surgery are linked to the closeness/proximity of the uterus and the ovaries to other critical pelvic structures which include urinary tract, bowel, nerves and blood vessels. There is therefore the need for a good knowledge of pelvic anatomy especially in cases with distorted anatomy from adhesions and intra-operative bleeding. Early recognition and repair of unintended injury provides the best chance in reducing major sequelae and complications.

The most common complications of hysterectomy can be categorized as Infections, Venous thromboembolic, Genitourinary, Gastrointestinal, Bleeding, Nerve injury, and vaginal cuff dehiscence. According to Clark-Pearson, infectious complications occur in abdominal hysterectomy (10.5%), vaginal hysterectomy (13.0%) and laparoscopic hysterectomy (9.0%). Genitourinary injury occurs at a rate of 1-2% for all gynaecology surgeries of which 75% occur in hysterectomies. Vaginal cuff dehiscence rate is 0.39% and it is commoner in laparoscopic hysterectomy (1.35%) and least in vaginal hysterectomy (0.08%)(Clarke-Pearson & Geller, 2013)

In a prospective study which looked at the incidence and location o f urinary tract injuries during hysterectomy at the department of obstetrics and gynaecology of the Louisiana State University in New Orleans, it was found that the incidence of urinary tract injury at

hysterectomy for benign disease is 4.3%, bladder damage is 2.9% and 1.8% for ureteral injury. The most common site of damage to the ureter was at the junction of the ureter and the uterine artery in over 80% of cases of ureteral injury (Ibeanu et al., 2009)

In a landmark Finish study (FINHYST) which prospectively reviewed over 5000 hysterectomy cases, it was detected that major complication rates in abdominal hysterectomy was 4%, laparoscopic hysterectomy was 4.3% and vaginal hysterectomy was 2.6% (Brummer et al., 2011) .Compared with laparoscopic hysterectomy, abdominal

hysterectomy increases the odds of wound infection and is also an independent risk factor for urinary tract infection and febrile events. Logistic regression analysis showed no significant differences between both approaches for any organ injury or other complications (Brummer et al., 2011).

Surgical adhesiolysis is the strongest single risk factor for major complications as a whole with an odds ratio of 2.4 (95% confidence interval, 1.38-4.21) (Brummer et al., 2011).

Conversion from laparoscopic hysterectomy or vaginal hysterectomy to abdominal hysterectomy was found to be

associated with the indication and type of hysterectomy. This was found to be higher for laparoscopic hysterectomy compared with vaginal hysterectomy (Stang, Merrill, & Kuss, 2011).

The incidence of pelvic organ fistula after hysterectomy ranges from 0.1-4%. This generally increases after radical hysterectomy compared with less radical surgery.

Risk factors for pelvic organ fistula include laparoscopic hysterectomy, total abdominal hysterectomy, increasing age, diverticulitis, smoking and pelvic adhesions (Forsgren & Altman, 2010).

In a study done at the Wayne State University School of Medicine/Detroit Medical Center, Detroit, MI comparing the risk of complications in emergency cesarean hysterectomy

amongst patients who underwent supra-cervical hysterectomy and total abdominal hysterectomy, they found no evidence of increased surgical time or complications with total abdominal hysterectomy and supra-cervical hysterectomy (Imudia et al., 2010).

In another retrospective study done at the department of Obstetrics and Gynaecology, Erlangen University Hospital in Nuremburg Germany between 2002 and 2008, longest hospital stay was more

associated with abdominal hysterectomy (10days) and shortest stay associated with total laparoscopic hysterectomy (5.7days). The shortest operating time was associated with vaginal hysterectomy (87minutes) compared with longest operating times linked to laparoscopic assisted vaginal hysterectomy (122minutes). The highest rate of postoperative complications was associated with abdominal hysterectomy(8.9%) (Müller et al., 2010).

At its outset, mortality from hysterectomy was as high as 100% in the best of hands, in large part due to the absence of antisepsis, blood banking, modern general anesthesia, and the attainment of standardized methodologies. The ensuing technical evolution of abdominal hysterectomy underwent a number of stages including the use of large mass tissue ligatures, refined isolation and control of the uterine vessels, intrafascial dissection, and finally the simplified extrafascial technique that has

become the standard approach to this procedure after publication by Richardson in 1929 (Brill, 2006).

Overall mortality rates from hysterectomy are 0.5–2 per 1000, and rates of visceral damage are 0.5–2% (Gupta & Manyonda, 2006). Complications are most common in women treated for uterine fibroids, and overall rates decrease with increasing age of women. Cost-effective analysis shows hysterectomy to be an effective and cost-effective intervention across a variety of indications. Conservative alternatives to hysterectomy, including endometrial ablative techniques, the Mirena intrauterine system (IUS), and uterine artery embolisation for fibroids, have not yet greatly reduced hysterectomy rates, which vary widely between regions, and within the same geographical area (Gupta & Manyonda, 2006).

Throughout the world hysterectomy remains one of the most frequently performed of all major surgical procedures, yet it continues to excite controversy and debate. What are the indications for hysterectomy today and how often should it be performed? Have new interventions replaced the need for hysterectomy? What is the best way to perform a hysterectomy when it is indicated? Should the cervix be retained? Should the ovaries be removed? What are the relative roles of abdominal, vaginal and laparoscopic methods of hysterectomy? (Garry, 2004).

A retrospective study of 172,344 patients who had total abdominal hysterectomy (T.A.H) done for uterine fibroids between 1999 and 2003 in the United States of America, found that mortality was not significantly related to hospital volumes or academic medical centre status. Morbidity was however found to be positively associated with academic medical centre status (odds ratio = 1.34, 95% confidence interval, 1.23-1.45). There was no

association between volume and haemorrhage, ureteral damage, bladder injury and intestinal injury (Juillard et al., 2009).

In an observational study in Mansoura Egypt which looked at the incidence, indications, management and

outcomes of repeat laparotomy after a T.A.H, the incidence of repeat laparotomy was 0.52 %(23/4386cases). Of these 60.9% were due to haemorrhage, 13% from urinary complications, and 6% intra-abdominal infections and 4.3% (one death). The conclusion was that repeat laparotomy after TAH, is an infrequent procedure and as such all precaution measures must be taken to reduce the need for a re-laparotomy(Fawzy & Zayed, 2012).

The informed consent process for hysterectomy requires discussion of several important considerations, such as the risks and benefits of prophylactic oophorectomy and the need for removal of the cervix. The preponderance of studies on hysterectomy outcomes has shown improvement of pelvic symptoms and quality of life (Falcone & Walters, 2008). Attention

to peri-operative details such as prophylactic antibiotics and prevention of venous thromboembolic events are important to assure a safe outcome (Falcone & Walters, 2008).

In a meta-analysis of published randomised controlled trials, which compared outcomes between total abdominal hysterectomy (TAH) and total laparoscopic hysterectomy (TLH) for benign disease, pooled odds ratios (OR) were calculated for categorical variables using random effects models as per Der Simonian and Laird. Continuous variables were compared by means of weighted mean differences (WMD). TLH is associated with reduced overall peri-operative complications (pooled OR 0.19; 95% CI 0.07-0.50) and reduced estimated blood loss (WMD -183ml; 95%

CI -346ml to -21ml; p=0.03). Additionally, there are trends towards shorter hospital stay (WMD -2.5 days; 95% CI -5.1 days to 0.01 days; p=0.05) and post-operative haematoma formation (pooled OR 0.17; 95% CI 0.03-1.01) compared to TAH (Walsh et al., 2009).

In women with non-malignant disease of the uterus, Laparoscopic assisted vaginal hysterectomy (LAVH) and vaginal hysterectomy (VH) seem to be the preferred hysterectomy techniques for general gynecological surgeons. Vaginal hysterectomy has the shortest operating time and least drop in hemoglobin, making it a suitable method for women for whom the shortest duration of surgery and anesthesia is optimal. LAVH is a versatile procedure, combining the advantages of both the vaginal and laparoscopic approach, and is preferable in cases when oophorectomy is required (Drahonovsky et al., 2010).

In one study done at the University of Port Harcourt Teaching Hospital in Nigeria, the leading complications were anaemia

(10.9%), abdominal wound dehiscence (11.1%), wound sepsis (7.8%) and febrile morbidity and post-operative symptoms (6.7%). They concluded that vaginal hysterectomy was associated with low treatment cost, shorter hospital stay, and less morbidity compared with abdominal hysterectomy (Kawuwa et al., 2012).

A lot has been researched on hysterectomies to date; however, there are so many unanswered questions in this area. Some of the unanswered questions include, total or subtotal hysterectomy (the better approach), to remove the ovaries or not and at which age, why surgeons prefer abdominal hysterectomy to vaginal hysterectomy despite

evidence that the latter is a better option? These should be the focus of future studies to help provide answers to the scientific community.

The objective of this study is to identify the common indications, complications and short term outcomes of hysterectomies done at the Korle bu Teaching Hospital over a five year period.

CHAPTER THREE

3.0 METHODS

3.1 Type of Study and Study Design

This was an analytic cross-sectional study involving a retrospective review of clinical records at the K.B.T.H over a 5 year period from January 1, 2008 to December 31, 2012. Medical records of all women who had hysterectomies at the Korle bu Teaching hospital during this study period were captured with the help of a data capture sheet (attached in the appendix section). The data collected was done along the lines of socio-demographic information, medical factors, indications, complications and short term outcomes. These data were analyzed quantitatively.

3.2 Study Location

Korle bu Teaching Hospital is located in the Ablekuma South Sub-Metropolitan district of the Greater Accra region of Ghana. It is bordered in the south by Korlegonno, north by Laterbiokoshie, east by Sodom and Gomorrah and in the west by Mamprobi. Due to the specialist service provided by this facility, it sub serves a wider population beyond its environs.
Currently, the Hospital has 2,000 beds and 17 clinical and diagnostic departments/units of which the study setting (Obstetrics and Gynaecology Unit) is a major part. It has an average daily attendance of 1,500 patients and about 250 patient admissions.

3.3 Study Population

This included all women who had major surgeries at the Obstetrics and Gynaecology department of the Korle bu Teaching Hospital during the study period.

3.4 Variables:

3.4.1 Dependent (Outcome) Variables

These include Indications of Hysterectomy, Complications of Hysterectomy and Outcomes of Hysterectomy.

3.4.2 Independent (Explanatory) Variables

These include age, parity, co-morbid factors, level of surgical expertise, uterine size, duration of surgery, past history of surgery, and type of hysterectomy.

VARIABLES

Table a: Operational Definitions

Variables	Operational Definitions	Measurements
Age	In years from last birthday	Ordinal
Parity	Low-1-2, Moderate-3-4 High- >5	Ordinal
Marital status	Single, married, divorced, widow, etc	Nominal
Level of Surgical Expertise	Houseman/ MO-1, Resident-2, Specialist-3, Consultant-4	Ordinal
Uterine Size	Abdominal size of uterus by palpation(tape)	Continuous
Past Surgical History	Yes/No	Nominal

VARIABLES

Table b: Operational Definitions

Variables	Operational Definitions	Measurements
Indication	Diagnosis leading to surgery.	Nominal
Complication	An unfavorable evolution of a disease, a health condition or a therapy.	Intra-operative- Post-operative<5days- nominal
Outcome	An end result; a consequence	Good- Cure, relief of symptoms, <5days stay. Bad- Death, >5days stay. nominal
Duration of Surgery	1-2 hours- average, >2 hours- long	Ordinal
Co-morbid Factors	Medical conditions other than diagnosis	Nominal
Type of Hysterectomy	TAH-1, SUBT-2,VAG-3, LAP-4,	Nominal

3.5 Sampling:

3.5.1 Sample Size

This included all women who had hysterectomies at the department of obstetrics and gynaecology during the study period.
On average 2 hysterectomies are done a day in the unit. This works to about ten (10) cases a week and forty (40) cases a month and four hundred and eighty (480) cases a year. For five years, a total of 2,400 hysterectomy cases were projected. However, problems with record keeping, file retrieval, missing data and periods of no surgery due to strike actions, medical school examinations et cetera reduced the actual sample size.

3.5.2 Sampling Method

This was done using a chart review of all records of hysterectomies done over the study period under review.

3.5.3 Inclusion and Exclusion Criteria

All women who had hysterectomy at the Korle bu Teaching Hospital from January 1, 2008 to December 31, 2012, were included in the study.

Women who had major surgery other than a Hysterectomy at the department of Obstetrics and Gynaecology at the KBTH during the study period were excluded from this study. Minor surgeries were also not factored into this study. On the outcome of hysterectomy, a good outcome included patients who spent less than five days on admission after surgery, had relief of presenting symptoms after hysterectomy and those who survived after a hysterectomy. Those who died during or soon after surgery spent more than five days on admission after hysterectomy and those who had no relief of symptoms after their surgery were considered to have poor outcomes. Outcomes were considered for only a short duration with a maximum cut-off of two weeks after surgery.

All hysterectomy cases with absent folders or no information were captured and used in the estimation of prevalence but analysed separately from those cases with complete information. All cases done at the department of obstetrics and gynaecology over the study period including minor and major cases were counted and used as the denominator in the calculation of the prevalence rate.

3.6 Data Collection Methods and Tools

With the help of a designed data capture sheet, data were collected from the department of Obstetrics and Gynaecology using theatre lists, theatre notes, patient's folders, hospital records and histopathology reports. All available data on women who had hysterectomies during the study period were reviewed. Three (3) research assistants were trained using the sample data capture sheet to help with the data collection exercise after an initial review of the questionnaire had been done with the help of consultant gynaecologists, gynaecology residents, and my supervisors. The data capture sheet used for the data collection can be found in Appendix 1.

3.7 Quality Control

Data collected were doubly entered the same day as collected. This helped to address any inconsistencies regarding wrong entries. Peer review of data capture sheet for errors and omissions was done with the help of gynaecology consultants, senior residents, and public health physicians before the process of data collection began. Training of personnel involved with the data collection process was done to equip them with the needed skills. Pretesting was done at the 37 Military Hospital, before

actual data collection began to check for errors and omissions. Data collected from theater books, recovery records, admission and discharge books and patient's folders were compared to get the correct information on each patient. Instances of missing folders were noted which cases were analysed separately. My active involvement in the process of data collection, entry and analysis helped to improve information quality.

3.8 Data Processing and Analysis

Data collected were grouped, tabulated and analyzed using STATA Version 11. Data was described with the help of Excel worksheet using the variables of interest. Data cleaning was done by removing duplicated data, invalid data, and correcting for spelling mistakes. Formatting of data was done and missing data were untouched but deleted only when entire record was absent. Using Epidata, data were entered and re-coding done before finally exporting data to Stata version 11 for final analysis. Frequency tables and Charts were used to summarize the data. Bivariate analysis was used to determine association between variables; Chi-square for proportions and t-test for comparison of means. Logistic regression was also used to check for relationships between outcome variables and predictive factors. Adjusted odds ratio was used to test for association using the multiple

regression model. Line graphs from Stata, were used to make comparisons of hysterectomies done in all the five years.

3.9 Ethical Issues

Ethical clearance was sought from the Ghana Health Service (GHS) Ethical Review Committee at the Research and Development Division in Accra. With this clearance, a formal approval was sought from the Korle bu Teaching Hospital Administration, the Head of Department of Obstetrics and Gynaecology, the Head of Department of Pathology and unit heads before commencing the study. No informed consent was sought from clients as this was a chart review and no names of clients were used in the analysis and reporting of research findings. This study posed no potential risks but may rather yield benefits. Privacy and confidentiality of information recorded on all hysterectomy clients involved in the study were ensured. Passwords were put on all data files and stored in both soft and hard copies to ensure security. Access to these files was made available only to the Principal Investigator (I) and Supervisors. Research assistants were motivated with small weekly sums of money for lunch and transportation to put in their best efforts;

however no payments were made to study participants. There was no conflict of interest in this study. Funding of this study was mainly from personal contributions of the Principal Investigator and a student's bursary from the Government of Ghana.

CHAPTER FOUR

4.0 RESULTS

4.1 General Characteristics of the Study:

The study was done at the department of Obstetrics and Gynaecology of the Korle bu Teaching Hospital in Accra, Ghana over a period of two months (May-June, 2013). During the five years under review (January 1st 2008- 31st December 2012), the department of Obstetrics and Gynaecology of the Korle bu Teaching Hospital (KBTH) recorded a total of 26,444 surgeries comprising of 20,033 obstetric cases and 6,411 gynaecology cases.

All women who were admitted in the unit and had hysterectomy during the period under review were included. A total of two thousand and ninety (2,090) hysterectomy cases were retrieved from patient's folders, theatre records, admission and discharge books and nurse's reports and data were captured and analysed. Thirty three cases (1.58%) had missing data. The mean age of women who had hysterectomies at the unit was 47years. Nulliparous women constituted 7.4% of hysterectomy cases with the rest being parous. Majority of the women were employed in the formal sector (38.4%) and farmers were in the minority (0.9%). More than half of the patients had at least primary level of education (95.0%) with only a little over 2.0% having no education at all. Patients who had hysterectomy were predominantly Christians 94.1% with Islam occupying the second position (4.9%).

Table 1: Socio-demographic characteristics of the samples stratified by type of hysterectomy

Parameter	Total	Obstetric	Gynaecology
	n=2090	***287(14.0%)***	***1770 (86.0%)***
Age			
mean	46.5±9.8	37.1±8.2	48.0±9.2
range	21-90	22-45	21-90
Parity			
none	154(7.4)	15(5.2)	132(7.5)
1	351(16.8)	53(18.5)	296(16.7)
2	456(21.8)	69(24.0)	382(21.6)
3	458(21.9)	57(19.9)	396(22.4)
>4	562(26.9)	45(15.7)	506(28.6)
Marital status			
single	225(10.8)	56(19.5)	165(9.3)
married	1681(80.4)	212(73.9)	1444(81.6)
divorced	88(4.2)	8(2.8)	78(4.4)
widowed	62(3.0)	1(0.3)	59(3.3)
other	13(0.6)	0(0)	12(0.7)
Occupation			
formal	803(38.4)	125(43.6)	678(38.3)
self employed	768(36.7)	43(15.0)	718(40.6)
trader	375(17.9)	81(28.2)	294(16.6)
farmer	18(0.9)	7(2.4)	11(0.6)
other	85(4.1)	25(8.7)	60(3.4)
Education			
none	56(2.7)	21(7.3)	35(2.0)
primary	255(12.2)	30(10.5)	225(12.7)
secondary	902(43.2)	88(30.7)	814(46.0)
tertiary	8812(38.9)	138(48.1)	674(38.1)
others	15(0.7)	4(1.4)	11(0.6)
Religion			
Christian	1966(94.1)	255(88.9)	1677(94.7)
Islam	103(4.9)	24(8.4)	79(4.5)
African	3(0.1)	1(0.3)	2(0.1)
pagan	1(0.0)	1(0.3)	0(0.0)

Continuous data is presented as mean ±standard deviation. Categorical data are presented as frequencies (percentages).

4.2 Prevalence of Hysterectomy

Of the 2090 cases of hysterectomy, 95% were done via the abdominal route whereas the remaining 5% were done per vaginam. Total hysterectomy and Sub-total type accounted respectively for 97.6% and 2.4% of all the cases.

The total five year prevalence of hysterectomy was 7.9% for department of Obstetrics and Gynaecology. The year 2010 recorded the highest prevalence of hysterectomy (31.1% and 2.0% for gynaecology and obstetrics respectively). There was a gradual decline in hysterectomy prevalence from 2008 to 2012 with exception of year 2011 which recorded the lowest prevalence rates (16.3% and 1.3% for gynaecology and obstetrics respectively).

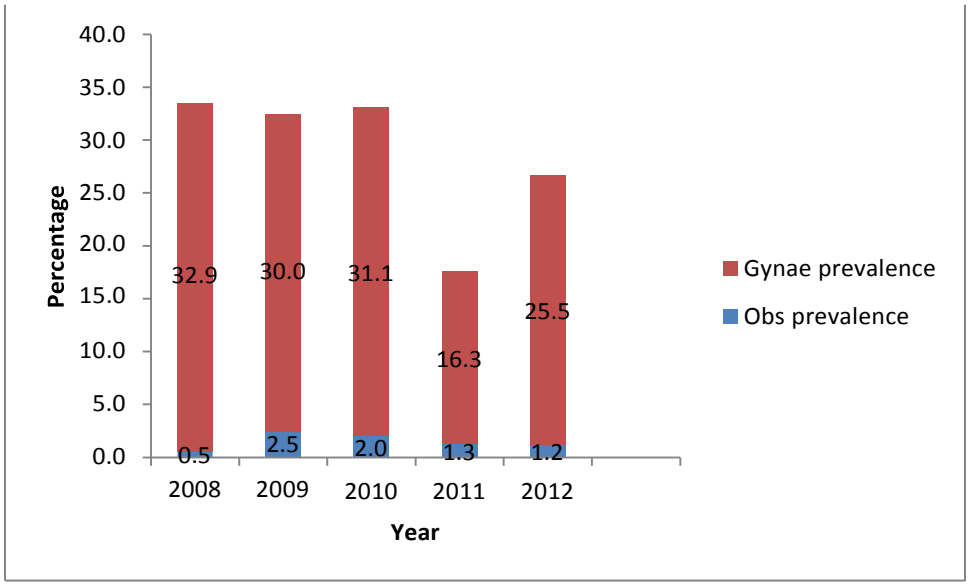


Figure 1: Prevalence of Hysterectomies from 2008-2012

4.3 Indications for Hysterectomy

The Indications for hysterectomy were many and varied. The ten topmost indications for hysterectomy at the department are shown in Figure 2. The prevalence of the various indications, in descending order is as follows: uterine fibroids 1406(67.3%), utero-vaginal prolapse 88(4.2%), ovarian tumour 84(4.0%), ruptured uterus 57(2.7%), cancer of the endometrium 54(2.6%), postpartum haemorrhage (PPH) 46(2.2%), haemorrhage 27(1.3%), uterine atony 25(1.2%), placenta anomalies 22(1.1%) and cancer of the cervix 18(0.9%). Other indications were adenomyosis, endometriosis, endometrial hyperplasia, post-menopausal bleeding, and septic abortions with gangrenous uterus, abdominal pregnancy and molar pregnancy.

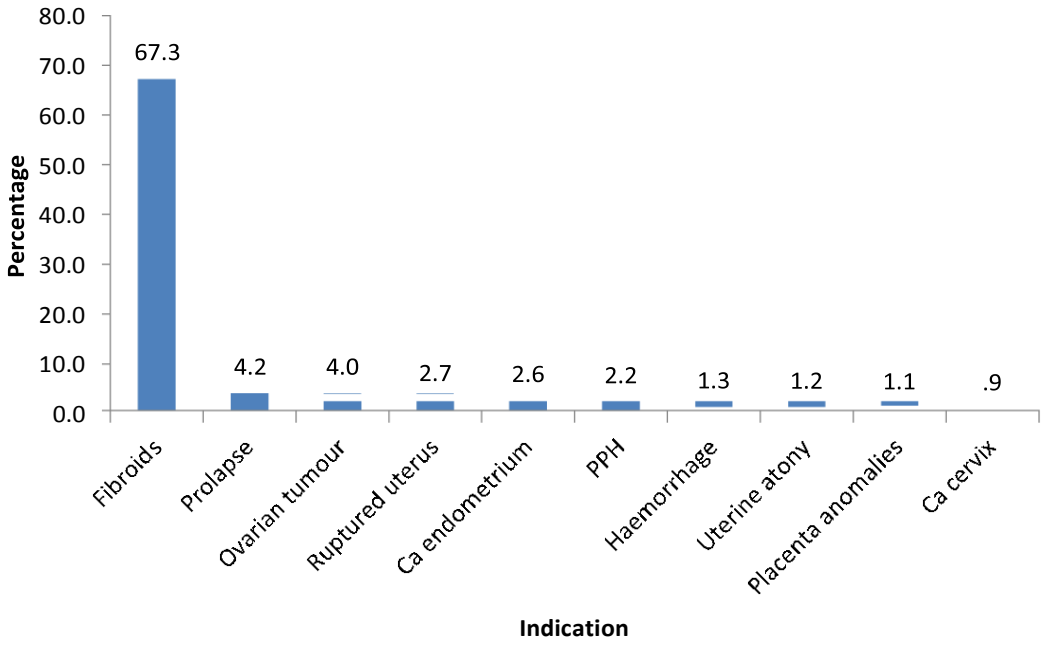


Figure 2: Top Ten Indications of Hysterectomy from 2008-2012

4.4 Complications of Hysterectomy

The complications of hysterectomy were grouped into intra-operative/peri-operative (during surgery) and post-operative complications (after surgery). A total of 370(17.70%) women had complications and 1720 (82.30%) women had no complications. The total numbers of complications of hysterectomy were 530 (25.36%). Some of the cases had only one complication whilst others had two or more complications at a time. About 13% of cases had only one complication, 3% had two complications and 2% had three or more complications. There were no complications in more than 82% of cases.

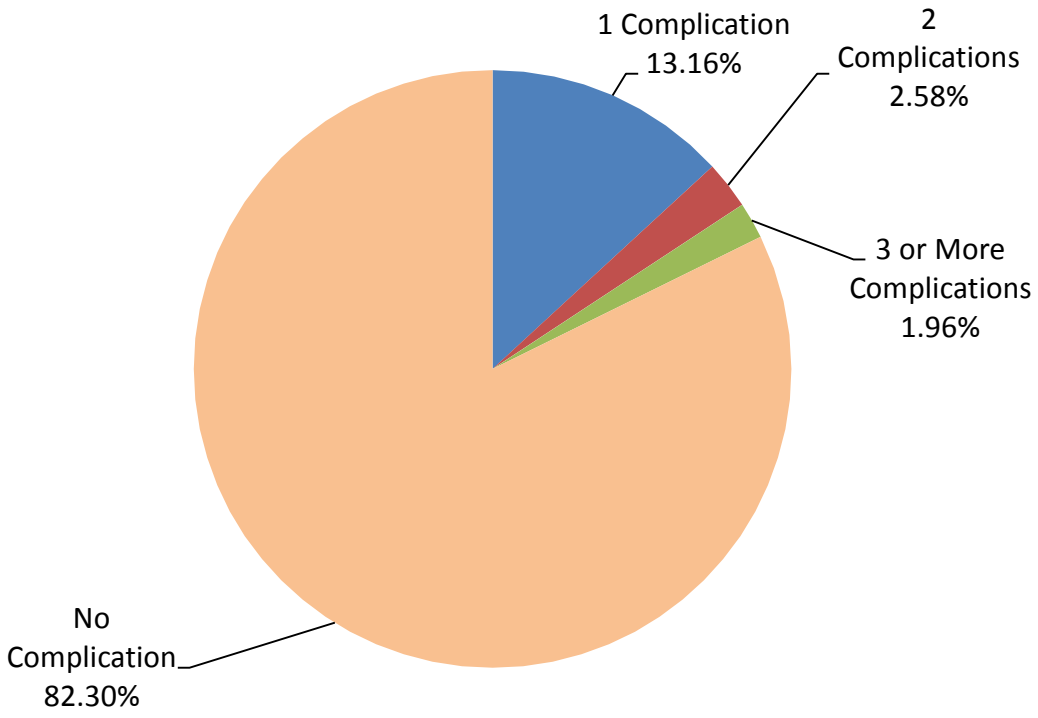


Figure 3: Complications of Hysterectomy

4.5 Surgical Complications and type of Hysterectomy

Haemorrhage (12.9%) was the commonest intra-operative complication of hysterectomy and blood transfusions (0.4%) occurred less frequently. In the post-operative period, however, blood transfusion (2.7%) was the commonest complication. Haemorrhage/haematoma (1.6%) and Anaemia (1.1%) occupied the second and third positions in terms of frequency of post-operative complications.

Haemorrhage occurred more in obstetrics (48.8%) than in gynaecology surgeries, p-value <0.0001. Intra-operative blood transfusions were commoner in obstetric (2.4%) cases than gynaecology (0.1%) cases, p-value <0.0001. Re-laparotomy within 24hours were more frequent in obstetrics than in gynaecology, p-value <0.0001.

Post-operative blood transfusions occurred more in obstetrics (19.2%) than gynaecology (0.1%) cases, p-value <0.0001.

Table 2: Prevalence of surgical complications stratified by the type of Surgery

Parameter	Total	Gynaecologic	Obstetric	
	n=2057	*n=1770*	*n=287*	P value
Peri-operative complications				
Haemorrhage (≥500ml)	**269(12.9)**	**125(7.1)**	**140(48.8)**	**<0.0001**
Hematoma	**20(1.0)**	**3(0.2)**	**17(5.9)**	**<0.0001**
Visceral injury	**12(0.6)**	**8(0.5)**	**4(1.4)**	**0.1313**
Vascular injury	**9(0.4)**	**4(0.2)**	**5(1.7)**	**0.002**
Other complications requiring treatment	**87(4.2)**	**21(1.2)**	**65(22.6)**	**<0.0001**
Intra-operative Blood Transfusion	**8(0.4)**	**1(0.1)**	**7(2.4)**	**<0.0001**
Post-operative complications				
Haemorrhage/hematoma	**34(1.6)**	**8(0.5)**	**26(9.1)**	**<0.0001**
Wound infection	**3(0.1)**	**0(0.0)**	**3(1.0)**	**0.0006**
Urinary tract infection	**2(0.1)**	**1(0.1)**	**1(0.3)**	**0.6553**
Deep vein thrombosis	**4(0.2)**	**2(0.1)**	**2(0.7)**	**0.1759**
Pulmonary embolism	**2(0.1)**	**1(0.1)**	**1(0.3)**	**0.6533**
Re-laparotomy within 24hours	**12(0.6)**	**1(0.1)**	**11(3.8)**	**<0.0001**
Anaemia (Hb<8g/dl)	**22(1.1)**	**1(0.1)**	**21(7.3)**	**<0.0001**
Blood Transfusion	**56(2.7)**	**1(0.1)**	**55(19.2)**	**<0.0001**

Data are presented as frequencies (percentages). Proportions are compared using chi-square test.

4.6 Outcomes of Hysterectomy- Short term:

Outcomes of hysterectomy were grouped into good or poor using duration of hospitalisation, effectiveness or non-effectiveness of the procedure at symptom relief and whether patient survived or died.

Majority of hysterectomies (87.7%) had good outcome with the rest having poor outcomes. More than half of hysterectomy cases (69.1%) spent on average less than five days at the hospital after surgery. Hysterectomy was effective for symptom relief in 97% of cases. A total of 7 deaths occurred out of the 2090 cases reviewed over the period with a rate of 0.3%.

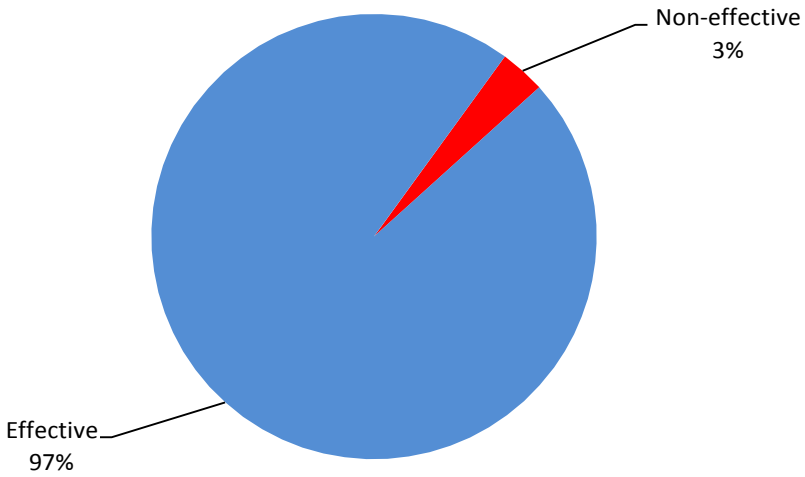


Figure 4: Effectiveness of Symptoms Relief with Hysterectomy

4.7 Effect of Socio-demographic and medical factors Surgical Complications

On its own, young age less than 40years was found to be associated with a higher risk of complications compared to older ages,(OR 6.7; 95% CI (3.6-12.4) with p-values < 0.0001). This was found not to be significant when age was adjusted with other socio-demographic and medical factors.

Nulliparity (zero parity) and low parities conferred higher risk of complications compared to higher parities greater than four. There was however no statistical significance in the multiple regression model when other factors were adjusted for.

Primary or higher education appeared on their own to offer a reduction in the risk of surgical complications compared to no education. This was found to be insignificant when education was adjusted for in multiple regressions. Marital status and religion were found on their own not to influence complications of hysterectomy.

Table 3: Socio-demographic factors associated with surgical complications

Parameter	N (%)	cOR(95%CI)	P value	aOR(95%CI)	P value
Age					
<30	53(57.0)	16.9(8.3-34.6)	<0.001	3.8(0.3-43.6)	0.280
31-40	129(34.3)	6.7(3.6-12.4)	<0.001	2.5(0.5-12.8)	0.289
41-50	130(12.0)	1.7(0.9-3.2)	0.078	1.2(0.2-6.0)	0.807
51-60	36(10.3)	1.5(0.7-2.9)	0.271	2.8(0.5-14.6)	0.228
*60+**	12(7.3)	1	-----	1	-----
Parity					
0	35(22.7)	2.3(1.5-3.8)	<0.001	2.7(1.0-7.6)	0.058
1	69(19.7)	2(1.4-2.9)	<0.001	2.1(0.8-5.4)	0.126
2	86(18.9)	1.9(1.3-2.7)	<0.001	2.5(1.0-6.3)	0.049
3	75.0(16.4)	1.6(1.1-2.3)	0.013	1.7(0.7-4.4)	0.274
*>4**	62(11.0)	1	-----	1	1
Education					
*none**	23(41.1)	1	-----	1	-----
Primary	47(18.3)	0.3(0.2-0.6)	<0.001	0.2(0.0-2.2)	0.193
Secondary/voc/tech	141(15.2)	0.3(0.1-0.5)	<0.001	0.2(0.0-2.0)	0.174
Tertiary	156(18.8)	0.3(0.2-0.6)	<0.001	0.1(0.0-1.2)	0.069
Marital status					
*single**	54(24.0)	1	-----	-----	-----
Married	286(17.0)	3.8(0.5-29.8)	0.206	-----	-----
Divorced	15(17.0)	2.5(0.3-19.0)	0.388	-----	-----
Widowed	7(11.3)	0.5(0.3-20.4)	0.403	-----	-----
Other	1(7.7)	1.5(0.2-13.6)	0.704	-----	-----
Religion				-----	-----
Christian	340(17.3)	0.2(0.0-1.5)	0.118	-----	-----
Islam	25(24.3)	0.3(0.0-2.4)	0.267	-----	-----
*traditional/pagan**	2(50.0)	1	-----	-----	-----

****Reference. Data is presented as proportions. cOR-crude Odds Ratio; aOR-adjusted Odds Ratio; CI-Confidence Interval. #p-values were generated from chi square analysis.***

4.8 Effect of Medical factors on Surgical Complications

The type of Surgery and type of hysterectomy were found to be strongly associated with the risk of developing a surgical complication when medical and socio-demographic factors were adjusted for in multiple regression. The risk of developing a surgical complication was reduced in gynaecology hysterectomy compared to obstetric hysterectomy (aOR; 0.1; 95% CI (0.0-0.3); p-value<0.001). The type of hysterectomy strongly influenced the risk of developing a complication. Vaginal hysterectomy posed the lowest risk compared with abdominal hysterectomy with a risk reduction of a factor 3.6 times. Total hysterectomy is more likely (p-value= 0.035) to have an effect on surgical complications than sub-total hysterectomy (p-value= 0.249).

Previous surgery, co-morbidity, uterine size, level of surgeon and duration of surgery on their own were found to influence the risk of developing a surgical complication. However in the adjusted model, these were found to be insignificant as risk factors for developing surgical complications at hysterectomy.

Table 4: Medical factors associated with surgical complications

Parameter	*N (%)*	*cOR(95%CI)*	*P value*	*aOR(95%CI)*	*P value*
Previous surgery					
no*	226(14.3)	1		1	
Yes	32(74.4)	17.4(8.6-35)	<0.001	1.9(0.2-17.5)	0.596
Co-morbid condition					
*no**	352(17.1)	1		1	-----
Yes	18(60.0)	7.3(3.5-15.2)	<0.001	0.3(0.1-1.3)	0.093
Uterus size					
small(<12 weeks)	30(14.1)	0.5(0.4-0.7)	<0.001	1.4(0.5-3.8)	0.527
moderate(12-16 weeks)	70(19.2)	0.4(0.2--0.6)	<0.001	1.3(0.7-2.4)	0.475
*large(>16 weeks)**	146(30.8)	1	-----	1	-----
Level of surgeon					
Resident	99(41.6)	1	-----	1	-----
Specialist	16(47.1)	1.2(0.6-2.6)	0.547	1.5(0.7-3.6)	0.316
Consultant	239(15.1)	0.3(0.2-0.3)	<0.001	5.1(0.5-51.5)	0.166
Duration of surgery					
<2hours	212(14.4)	0.4(0.2-0.6)	<0.001	3.3(0.4-30.1)	0.287
*>2hours**	30(30.9)	1	-----	1	-----
Type of surgery					
Gynaecology	161(9.1)	0.04(0.03-0.05)	<0.001	0.1(0.0-0.3)	<0.001
*obstetric**	205(71.4)	1	-----	1	-----
EBL					
<200	10(12.5)	0.02(0.0-0.05)	<0.001	0.01(0.0-0.1)	<0.001
200-500	101(21.3)	0.03(0.01-0.08)	<0.001	0.02(0.0-0.2)	<0.001
501-1000	80(86.0)	0.6(0.2-2.1)	0.446	1.1(0.1-8.2)	0.955
1001-1500	16(94.1)	1.6(0.2-15.8)	0.669	1.1(0.0-23.6)	0.967
*>1500**	39(90.7)	1	-----	-----	-----
Type of hysterectomy					
Total	286(15.3)	2.9(1.3-6.8)	0.011	12.0(1.2-120.7)	0.035
Sub-total	92(65.3)	30.7(11.2-84.6)	<0.001	13.0(1.2-1010.8)	0.249
Abdominal	36(80.0)	65.3(21.7-196.5)	<0.001	3.6(0.2-84.3)	0.423
*Vaginal**	6(5.8)	1	-------		

**Reference. Data is presented as proportions. cOR-crude Odds Ratio; aOR-adjusted Odds Ratio; CI-Confidence Interval. EBL-estimated blood loss. aOR is for all the significant p-values*

4.9 Effect of Medical factors on Duration of Hospitalization

Co-morbidity and duration of surgery were found to be strongly linked to the duration of hospital stay and recuperation after hysterectomy. Patients who had co-morbid conditions such as diabetes mellitus, hypertension, sickle cell anaemia and asthma were more likely (aOR; 0.04; 95% CI (0.0-0.4); p-value=0.007) to stay more than five days at the hospital after surgery compared with those with no co-morbid condition prior to hysterectomy. Patients whose hysterectomies lasted less than two hours were likely to be discharged home earlier (aOR; 0.01; 95% CI (0.0-0.3); p-value=0.004) than those whose surgeries lasted longer than two hours.

Table 5: Medical factors associated with duration of hospitalization and recuperation after surgery

	N (%)	cOR(95%CI)	P value	aOR(95%CI)	P value
Previous surgery					
No	35(2.2)	0.02(0.01-0.03)	----	0.6(0.2-22.4)	0.821
yes*	24(57.1)	1	<0.001	1	-------
Co-morbid condition					
No	53(2.6)	0.02(0.01-0.05)	<0.001	0.04(0-0.4) 1	**0.007**
yes*	16(53.3)	1		1	-----
Uterus size					
small(<12 weeks)	3(1.4)	0.2(0.1-0.8)	0.019	1.8(0.1-27.1)	0.660
moderate(12-16 weeks)	6(1.7)	0.3(0.1-0.7)	0.005	1.4(0.2-11.4)	0.747
large(>16 weeks)	27(5.7)	1	--	1	----
Level of surgeon					
Resident	17(7.2)	3.4(1.3-8.8)	0.014	5.7(0.2-140.8)	0.290
Specialist	7(20.6)	0.4(0.2-0.6)	<0.001	62.1(1.0-3.96)	0.051
Consultant	42(2.7)	1	----	1	----
Duration of surgery					
<2hours (Good)	32(2.2)	0.05(0.03-0.10)	<0.001	0.01(0 -0.3) -	**0.004**
≥2hours (Poor)	28(28.9)	1	---	1	----
Type of surgery					
Gynaecology	6(0.3)	0.01(0.01-0.03)	<0.001	0.1(0.01-0.6)	0.019
Obstetric	63(22.2)	1	----	1	----
EBL					
<200	3(3.8)	0.2(0-0.6)	0.006	30.5(0.3-34.2)	0.157
200-500	12(2.5)	0.1(0-0.3)	<0.001	5.1(0.1-24.0)	0.412
501-1000	7(7.5)	0.3(0.1-0.9)	0.03	0.4(0.02-10.8)	0.921
1001-1500	4(23.5)	1.1(0.3-4.4)	0.826	29(0.2-51.9)	0.203
*>1500**	9(20.9)	1	----	1	----
Type of hysterectomy					
Total	45(2.4)	2.6(0.4-18.8)	0.345	----	0.956
Sub-total	12(25.0)	34.7(4.3-276.1)	0.001	----	0.261
Abdominal	9(20.0)	26(3.2-212.4)	0.002	----	0.786
*Vaginal**	1(1.0)	1	----	1	----

Reference. Data is presented as proportions. cOR-crude Odds Ratio; aOR-adjusted Odds Ratio; CI-Confidence Interval. EBL-estimated blood

CHAPTER FIVE

5.0 DISCUSSIONS

5.1 Key findings:

The mean age of women who had hysterectomy at the department of Obstetrics and Gynaecology at the Korle bu Teaching Hospital (KBTH) from January 1st 2008 to December 31st 2012 was 47years. Majority of hysterectomy patients were parous (92.6%), had at least a primary level of education (95.0%), and were Christians (94.1%).

The total prevalence of hysterectomy at the department was 7.9%. This rate is very high compared to national hysterectomy rates of high income countries which ranges from the highest of about 5.4

per 1000 hysterectomies in the USA to a low of 1.2 per 1000 in Norway (Garry, 2004). However, this is

an institutional rate and especially coming from a teaching hospital with a high patient turnover. This rate was slightly higher than the peripartum hysterectomy rate 4.34 per 1000 deliveries from the same department (Kwame-Aryee et al., 2010). The average peripartum hysterectomy in the unit from this study was 1.5%, which is comparable to a similar study done in King Edward VIII Hospital, South Africa with a rate of 1.8% (Sebitloane & Moodley, 2004). Over 2,090 hysterectomies were done over the five year period. Majority of these cases were done via the abdominal route (95.0%) and the rest were through the vaginal route. The implication is that there is a higher preference for abdominal hysterectomies compared to vaginal hysterectomies. This does not agree with recommendations from a Cochrane review which stated that the vaginal approach is the surgical route of choice for hysterectomy(Falcone & Walters, 2008). The year 2011 recorded the lowest prevalence of hysterectomies (5.1%) at the department of Obstetrics and Gynaecology of the KBTH. The reasons given for this low rate in 2011 were that the

gynaecology theatre was closed down for several months that year due to a faulty anaesthetic machine and lack of gas supply from a stolen gas pipe. Majority of hysterectomies are usually done in the gynaecology theatre, hence the drop in the rate of hysterectomy that year.

The Indications for hysterectomy were several and varied. The top five indications for hysterectomy at the unit were uterine fibroids, utero-vaginal prolapse, ovarian tumour, ruptured uterus, and cancer of the endometrium. This is comparable to a study on by Kawuwa and Mairiga in 2012 in which uterine fibroids was the commonest indication ,63.3% (Kawuwa et al., 2012). A critical look at the histopathology results of hysterectomy specimens confirmed majority of the clinical diagnosis. However, in a few instances some cases turned out to be adenomyosis and sarcomas but were initially diagnosed clinically as uterine fibroids. A few rare cases were also recorded some of which included an undescended testes with a vestigial uterus, At the KBTH, gynaecologic hysterectomies were frequently done as elective surgeries which contribute to a large proportion of total hysterectomies (86%) compared to Obstetric hysterectomies (14%) which were usually done as emergencies.

The top five Obstetric indications for hysterectomy were ruptured uterus, postpartum haemorrhage, and other types of haemorrhage, uterine atony and placenta anomalies. The leading gynaecologic indications for hysterectomy were uterine fibroids, utero-vaginal prolapse, and ovarian tumour, cancer of the endometrium and cancer of the cervix.

The total number of hysterectomy complications over the period was 530 (17.7%). About 1720 patients had no complications during and within the first few days after hysterectomy. The commonest complications were Haemorrhage, Haematoma, Blood transfusion, and Anaemia. This is contrary to the findings of a similar study by Clark-Pearson et al in which the common

complications of hysterectomy were Infections, Venous thromboembolic, Genitourinary, and Bleeding(Clarke-Pearson & Geller, 2013).

Short term outcomes of hysterectomies done over the period were favourable in terms of effectiveness of symptoms relief, duration of hospital stay and mortality. About 70% of hysterectomy patients spent less than five days on admission after surgery, over 97% had symptoms relief and a total of seven deaths were recorded giving a rate of 0.3%. This is comparable to rates from literature of 0.5-2 per 1000 (S. Gupta & Manyonda, 2006). About half of these deaths were cases of septic abortions which led to hysterectomies.

The risk of developing a surgical complication was strongly associated with the type of surgery (Obstetric/Gynaecologic), the type of hysterectomy (Total/Sub-total/Vaginal/Abdominal) and the estimated blood loss (EBL). Obstetric hysterectomies recorded high frequencies of surgical complications compared with Gynaecologic hysterectomies. This could be due to the emergency nature of Obstetric hysterectomies which usually require speed to save lives of mothers and their babies. The risks of surgical complications were three (3x) times greater for abdominal hysterectomies compared with vaginal hysterectomies. This is supported by a retrospective study done in 2010 at the Erlangen University Hospital which quoted that the highest rate of postoperative complications was associated with abdominal hysterectomy (8.9%) (Müller et al., 2010).

Patients with co-morbid conditions prior to hysterectomy and those who had prolonged surgery (greater than 2hours) stayed longer at the hospital compared to those without co-morbid factors and shorter duration of surgery (less than 2hours). This is not surprising because on the average most hysterectomies are completed by 2hours. Hence whenever surgeons take a longer period,

there may be problems like adhesions which may make the procedure difficult. This can lead to complications such as injury to adjacent structures and haemorrhage. Also a co-morbid condition such as pelvic inflammatory disease may lead to the development of adhesions and predispose the patient to complications. All these may make the patient stay longer at the hospital than usual.

5.2 Strengths of the study: A large sample size of 2,090 hysterectomy cases helped to increase the power of the study. The use of multiple data sources enabled an almost complete data to be captured

on each case. Data were collected from theatre notes, admission and discharge summaries, Nurses reports, and case notes and histopathology reports. Pre-testing of questionnaire was done to remove irrelevant questions, reviews of questionnaire were done by senior colleagues, and captured data were entered the same day and doubly entered to reduce errors. Data cleaning was done all in a bid to improve data quality.

5.3 Limitations of the study: There were instances of incomplete data, poor data quality (unreadable), and missing data. The peculiar policy of the Korle bu Teaching Hospital where folders with clinical notes are given to patients to take home, led to some missing data. There was lack of histopathology diagnosis in some cases for confirmation of diagnosis.

5.3 Negative results: Contrary to general knowledge that total abdominal hysterectomies are more associated with a greater risk of complications compared with subtotal hysterectomies, in this study sub-total

hysterectomy posed a greater risk of developing a complication about 10times greater than total hysterectomy (Sutton, 2010).

5.4 Implications for further study: This study has established a baseline prevalence of hysterectomy at the department of Obstetrics and Gynaecology of the KBTH. Future studies may explore risk factors for complications using case control studies. A qualitative study to explore

reasons why doctors do more abdominal hysterectomies compared to vaginal hysterectomy could be investigated in future. These may help surgeons to avoid or mitigate these risk factors to improve hysterectomy outcomes.

CHAPTER SIX

6.0 Conclusions

Hysterectomy is a common surgical procedure at the department of Obstetrics and Gynaecology at the Korle bu Teaching Hospital. Although hysterectomies were associated with some complications, the general Outcomes of hysterectomy were favourable. Total abdominal hysterectomy was the predominant surgery at the department.

6.1 Recommendations

The policy at the KBTH where patients take folders home should be reviewed. Measures should be taken by hospital authorities to ensure that all patients' information is entered in a computer database before giving folders out. Clinicians should be encouraged to enter complete data on all their patients in a legible manner to enable future researchers capture information efficiently. Surgeons should be encouraged to perform more vaginal hysterectomies in clients who qualify for it since vaginal hysterectomy is found in literature to be associated with less morbidity compared to the abdominal hysterectomy.

References:

Bansal, N., Hiremath, P. B., Meenal, C., & Prasad, V. (2013). An audit of indications and complications associated with elective hysterectomy at SVMCH and RC, Ariyur, Pondicherry. *International Journal of Medical Research & Health Sciences*, *2*(2), 147–155.

Brill, A. I. (2006). Hysterectomy in the 21st century: different approaches, different challenges. *Clinical Obstetrics and Gynecology*, *49*(4), 722–735.

Brummer, T. H. I., Jalkanen, J., Fraser, J., Heikkinen, A. M., Kauko, M., Mäkinen, J., … Härkki, P. (2011). FINHYST, a prospective study of 5279 hysterectomies: complications and their risk factors. *Human Reproduction*, *26*(7), 1741–1751.

Carlson, K. J. (1997). Outcomes of hysterectomy. *Clinical Obstetrics and Gynecology*, *40*(4), 939–946.

Clarke-Pearson, D. L., & Geller, E. J. (2013). Complications of Hysterectomy. *Obstetrics & Gynecology*, *121*(3), 654–673.

DuBeshter, B., Angel, C., Toy, E., Thomas, S., & Glantz, J. C. (2013). Current Role of Robotic Hysterectomy. *Journal of Gynecologic Surgery*. Retrieved from http://online.liebertpub.com/doi/abs/10.1089/gyn.2012.0113

Erekson, E. A., Weitzen, S., Sung, V. W., Raker, C. A., & Myers, D. L. (2009). Socioeconomic indicators and hysterectomy status in the United States, 2004. *The Journal of Reproductive Medicine*, *54*(9), 553.

Falcone, T., & Walters, M. D. (2008). Hysterectomy for benign disease. *Obstetrics & Gynecology*, *111*(3), 753–767.

Fawzy, M., & Zayed, A. (2012). Repeat laparotomy after abdominal hysterectomy. *Journal of Gynecologic Surgery*, *28*(3), 197–201.

Flory, N., Bissonnette, F., & Binik, Y. M. (2005). Psychosocial effects of hysterectomy: literature review. *Journal of Psychosomatic Research*. Retrieved from http://psycnet.apa.org/psycinfo/2005-13759-001

Forsgren, C., & Altman, D. (2010). Risk of pelvic organ fistula in patients undergoing hysterectomy. *Current Opinion in Obstetrics and Gynecology*, *22*(5), 404–407.

Garry, R. (2004). The future of hysterectomy. *BJOG: An International Journal of Obstetrics & Gynaecology*, *112*(2), 133–139.

Glaze, S., Ekwalanga, P., Roberts, G., Lange, I., Birch, C., Rosengarten, A., … Ross, S. (2008). Peripartum hysterectomy: 1999 to 2006. *Obstetrics & Gynecology*, *111*(3), 732–738.

Grundy, V. (2006). Complications of hysterectomy. *US Pharm*, *9*, 22.

Gupta, S., & Manyonda, I. (2006). Hysterectomy for benign gynaecological disease. *Current Obstetrics & Gynaecology*, *16*(3), 147–153.

Gupta, Sahana, & Manyonda, I. (2011). Total and subtotal abdominal hysterectomy for benign gynaecological disease. *Obstetrics, Gynaecology & Reproductive Medicine*, *21*(2), 36–40. doi:10.1016/j.ogrm.2010.11.002

Hill, E. L., Graham, M. L., & Shelley, J. M. (2010). Hysterectomy trends in Australia–between 2000/01 and 2004/05. *Australian and New Zealand Journal of Obstetrics and Gynaecology*, *50*(2), 153–158.

Holmberg, S., & Nordberg, E. (1990). Surgical rates in Africa. Variations and their possible explanations. *Tropical and Geographical Medicine*, *42*(4), 352.

Ibeanu, O. A., Chesson, R. R., Echols, K. T., Nieves, M., Busangu, F., & Nolan, T. E. (2009). Urinary tract injury during hysterectomy based on universal cystoscopy. *Obstetrics & Gynecology*, *113*(1), 6.

Imudia, A. N., Hobson, D. T. G., Awonuga, A. O., Diamond, M. P., & Bahado-Singh, R. O. (2010). Determinants and complications of emergent cesarean hysterectomy: supracervical vs total hysterectomy. *American Journal of Obstetrics and Gynecology*, *203*(3), 221–e1.

Ingelsson, E., Lundholm, C., Johansson, A. L., & Altman, D. (2011). Hysterectomy and risk of cardiovascular disease: a population-based cohort study. *European Heart Journal*, *32*(6), 745–750.

Johnson, N., Barlow, D., Lethaby, A., Tavender, E., Curr, L., & Garry, R. (2005). Methods of hysterectomy: systematic review and meta-analysis of randomised controlled trials. *BMJ*, *330*(7506), 1478.

Juillard, C., Lashoher, A., Sewell, C. A., Uddin, S., Griffith, J. G., & Chang, D. C. (2009). A national analysis of the relationship between hospital volume, academic center status, and surgical outcomes for abdominal hysterectomy done for leiomyoma. *Journal of the American College of Surgeons*, *208*(4), 599.

Kafy, S., Huang, J. Y., Al-Sunaidi, M., Wiener, D., & Tulandi, T. (2006). Audit of morbidity and mortality rates of 1792 hysterectomies. *The Journal of Minimally Invasive Gynecology*, *13*(1), 55–59.

Kawuwa, M. B., Mairiga, A. G., & Audu, B. M. (2012). Indications And Complications Of Hysterectomy InMaiduguri, Northeastern Nigeria. *Kanem Journal of Medical Sciences (KJMS)*, *1*(1). Retrieved from http://kjmsmedicaljournal.com/ojs/index.php/homepage/article/view/5

Kwame-Aryee, R. A., Kwakye, A. K., & Seff, J. D. (2010). Peripartum hysterectomies at the Korle-Bu Teaching Hospital: A review of 182 consecutive cases. *Ghana Medical Journal*, *41*(3). Retrieved from http://www.ajol.info/index.php/gmj/article/view/55281

Müller, A., Thiel, F. C., Renner, S. P., Winkler, M., Häberle, L., & Beckmann, M. W. (2010). Hysterectomy—A comparison of approaches. *Deutsches Ärzteblatt International*, *107*(20), 353.

Neiboer, T. E., Johnson, N., & Barlow, D. (2006). Surgical approach to hysterectomy for benign gynaecological disease. *Cochrane Database Syst Rev*, *2*.

Okogbenin, S. A., Gharoro, E. P., Otoide, V. O., & Okonta, P. I. (2003). Obstetric hysterectomy: Fifteen years' experience in a Nigerian tertiary centre. *Journal of Obstetrics & Gynecology*, *23*(4), 356–359.

Sebitloane, M. H., & Moodley, J. (2004). Emergency peripartum hysterectomy. *East African Medical Journal*, *78*(2), 70–74.

Seffah, J. D., & Adanu, R. M. (2006). Hysterectomy for uterine fibroids in Nullipara at Korle Bu Teaching Hospital, Ghana. *Tropical Journal of Obstetrics and Gynaecology*, *22*(2), 125–128.

Shao, J. B., & Wong, F. (2008). Factors influencing the choice of hysterectomy. *Australian and New Zealand Journal of Obstetrics and Gynaecology*, *41*(3), 303–306.

Stang, A., Merrill, R. M., & Kuss, O. (2011). Nationwide rates of conversion from laparoscopic or vaginal hysterectomy to open abdominal hysterectomy in Germany. *European Journal of Epidemiology*, *26*(2), 125–133.

Stany, M. P., & Farley, J. H. (2008). Complications of gynecologic surgery. *Surgical Clinics of North America*, *88*(2), 343–359.

Surendran, S. (2011). Uterine Volume: an aid to determine the route and technique of hysterectomy. Retrieved from http://119.82.96.198:8080/jspui/handle/123456789/4740

Sutton, C. (2010). Past, present, and future of hysterectomy. *Journal of Minimally Invasive Gynecology*, *17*(4), 421–435.

Vesco, K. K., Marshall, L. M., Nelson, H. D., Humphrey, L., Rizzo, J., Pedula, K. L., … Antoniucci, D. (2012). Surgical menopause and nonvertebral fracture risk among older US women. *Menopause*, *19*(5), 510.

Walsh, C. A., Walsh, S. R., Tang, T. Y., & Slack, M. (2009). Total abdominal hysterectomy versus total laparoscopic hysterectomy for benign disease: a meta-analysis. *European Journal of Obstetrics, Gynecology, and Reproductive Biology*, *144*(1), 3.

Wingo, P. A., Huezo, C. M., Rubin, G. L., Ory, H. W., & Peterson, H. B. (1985). The mortality risk associated with hysterectomy. *American Journal of Obstetrics and Gynecology*, *152*(7 Pt 1), 803.

Wright, J. D., Devine, P., Shah, M., Gaddipati, S., Lewin, S. N., Simpson, L. L., … Herzog, T. J. (2010). Morbidity and mortality of peripartum hysterectomy. *Obstetrics & Gynecology*, *115*(6), 1187.

APPENDICES

DATA CAPTURE SHEET FOR HYSTERECTOMIES IN KORLE BU: 1ST JANUARY 2008- 31ST DECEMBER 2012

1. Age in years
2. Parity – 1, 2, 3, >4
3. Marital status(married, single, divorced, widowed, others)
4. Occupation- formal/informal, self-employed, trader, farmer, other
5. Educational background- primary, secondary, tertiary, none, other
6. Religion – Christianity, Islamic, African traditional religion, pagan, atheist, others
7. Previous surgery- Yes/No. If YES, state type of surgery?
8. Medical history- diabetes, hypertension, asthma, tuberculosis, cancer, sickle cell disease, anaemia, pelvic inflammatory disease, endometriosis etc
9. Size of uterus- a. small(<12wks), b. moderate(12-16wks), c. large(>16wks)
10. Presenting symptoms/complaints
11. Level of surgeon- consultant, specialist, resident, medical officer, other
12. Indication /Diagnosis prior to surgery?
13. Histopathological diagnosis after surgery?
14. Duration of surgery? (<2hours-good, >2hours-poor)
15. Type of surgery? A. Elective, B. Emergency, C. Obstetric, D. Gynaecological
16. Type of Hysterectomy?
    A. Total
    B. Sub-total
    C. Abdominal
    D. Vaginal
    E. Laparoscopic
17. Operative findings-

18. Complications of Hysterectomy
    A. Intra-operative-
        i. Haemorrhage(>/= 500ml)
        ii. Hematoma
        iii. Visceral injury- bladder, Ureter, bowel
        iv. Vascular injury- aorta, vena cava, epigastric
        v. Other complications requiring additional procedures or treatment
        vi. Blood transfusion
        vii. Disseminated intravascular coagulation

    B. Post-operative
        i. Haemorrhage/hematoma
        ii. Wound infection(requiring antibiotics/drainage)
        iii. Urinary tract infection
        iv. Deep vein thrombosis
        v. Pulmonary embolism
        vi. Re-laparotomy within 24hours
        vii. Anaemia (post-op. Hb<8g/dl)
        viii. Blood transfusion

19. Outcomes of hysterectomies- short term
    i. Effectiveness of relief of symptoms
    ii. Duration of hospitalization and recuperation(<5days-good, >5days-poor)
    iii. Use of healthcare resources
    iv. Healthcare costs
    v. Mortality (bad/poor)

BUDGET

ITEM	ESTIMATED COST IN CEDIS
PRINTING	400.00
TRAINING OF ASSISTANTS	200.00
TRANSPORT	400.00
BINDING	200.00
INTERNET	200.00
REFRESHMENT	300.00
MISCELLANEOUS	300.00
TOTAL	**2,000.00**

SCHEDULE OF ACTIVITY:

NUMBER	ACTIVITY	DURATION 2013
1.	SURVEY OF STUDY AREA	FEB 4-8
2.	TRAINING MANUAL DEVELOPMENT	FEB 9-16
3.	TRAINING OF ASSISTANTS	FEB 19-28
4.	PRETESTING OF QUESTIONNAIRE	MARCH 4-8
5.	QUESTIONNAIRE FINE-TUNING	MAY 28-JUNE 4
6.	DATA COLLECTION	JUNE 10-28
7.	DATA ENTRY	JUNE 28-JULY4
8	DATA ANALYSIS	JULY4-10
9.	REPORT WRITING	JULY7-14
10.	SUBMISSION OF DRAFT TO SUPERVISORS	JULY15- 19
11.	REPORT PRESENTATION	JULY 31
12.	DISSEMINATION	0CTOBER 2013