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Psychosocial Determinants of Elective Cesarean Section Deliveries in Selected Obstetric Facilities in Nairobi, Kenya

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Abstract

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Tom Joseph Oguta

MS, University of Nairobi, 2002

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Cesarean section (CS) rates have generally increased across the world in the past decade. Reducing elective cesarean section (ECS) rates is imperative as many countries aim to maintain threshold CS rates at or below 15%, the level recommended by the United States' National Institutes of Health. Women are believed to consider ECS for various interconnected psychosocial reasons, but few quantitative studies have investigated these factors. This prospective cohort study was based on the social ecological model (SEM) and the theory of planned behavior (TPB) models, and identified the psychosocial predictors of ECS among 1,268 expectant women in 2 hospitals in Nairobi. Participants completed a structured questionnaire consisting of 10 validated psychosocial scales and were followed for actual mode of delivery (MoD) from hospital records and postnatal telephone interviews. The overall prevalence of CS and ECS were 16.0% and 6.4%, respectively; the CS rate was not statistically higher than the recommended 15% ($p > 0.05$). The combined CS incidence rate for these 2 hospitals was 83 per 1,000 births per month. Autonomy, fear of childbirth, pregnancy related anxiety, perceived social support from friends, and outcome expectancy for birth were statistically significant predictors of ECS, given the parity and age at first pregnancy, $\chi^2(df = 19) = 77.735$, $p<.001$; Nagelkerke $R^2 = .170$. The results have social change implications on finding ways to reduce tocophobia by managing expectations for negative birth outcomes and improving support from friends during pregnancy and labor. Recommendations include a greater consideration of the psychosocial status of women in prenatal lessons and more accurate information on the risks and benefits of both CS and spontaneous vaginal delivery.

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Dedication

To my mother and father, Mama Jenipher Anyango and Jaduong' Ezekiel Oguta Kiria, who set me forth into the struggles of this life: Although not learned yourselves, the ember you lit kept burning. Your conviction that knowledge is power, that it is possible to reach premiere heights, propelled this finale. It is a distant dream fulfilled.

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Chapter 1: Introduction

Cesarean section rates have been on the rise in the last decade all over the world

(Betrán et al., 2007), signaling the parallel advances in obstetric technology, increased

conditions for medical indication (Getahun, Oyelese, Salihu, & Ananth, 2006; Jelovsek,

Maher, & Barber, 2007), physician preference (Kassak, Ali, & Abdallah, 2005) and

patient demand for nonindicated CS (Liu et al., 2007).

Most CS cases are medically indicated but the recent increase in women

demanding for ECS outside the known medical and obstetric reasons also contribute to

the overall CS burden (Liu et al., 2007). Cesarean section rates are much higher in the

urban (Lobel & De-Luca, 2007) and in private hospitals(Wiklund, Edman, & Andolf,

2007) than in the rural and public hospitals respectively but it is not clear to what extent

ECS contributes to the overall CS rates, hence the need to establish incidence rate of

ECS.

The debate on reasons for ECS rage on and most studies on the topic are

qualitative with discrete focus on individual factors (Pang et al., 2007). A few

quantitative studies have focused on psychosocial predictors of ECS (Lin, & Xirasagar,

2005), hence this quantitative studies aims to determine, through logistic regression, the

combination of psychosocial factors influencing ECS outcome in two national hospitals

in Nairobi city. Understanding the incidence rates and predictors of ECS has social

change implications for reproductive health by influencing prenatal programs designed to

reduce unnecessary ECS incidences.

In this chapter, the different parts of the study prologue are described including the study background, problem to be addressed, key concepts as well as the research plan in relation to the cesarean section deliveries on maternal request. The chapter covers several sections including study background, problem statement, purpose, nature, research questions, and hypotheses. It also outlines the theories on which the study is based, terminologies, assumptions, limitations, and the implications for social change.

Background

An analysis of global, regional, and national cesarean section (CS) rates shows that an estimated 15% of all deliveries worldwide occur by CS (Betrán et al., 2007). This general prevalence masks an uneven distribution and wide variations by continent, region and country. Regional CS rates, for example vary from 0-40% (Sufang, Padmadas, Fengmin, Brown, & Stones, 2007). The World Health Organization's 1995 assertion that a CS rate above 10-15% confers no additional health benefits has made countries and national public institutions pursue CS rates of 15% or below (Althabe, & Belizán, 2006; Betrán et al., 2007).

A review of demographic and health surveys show that many countries exceed this recommended rate and that CS rates have been escalating in the last few decades, especially in urban, private health settings of developing countries (Stanton & Holtz, 2006; Villar et al., 2006). This increase is partly due to developments in health technology as well as improvements in utilization of and access to and obstetric care services (Liu et al., 2007). It is also partly due to community and personal factors (Betrán et al., 2007; Leone, Padmadas, & Matthews, 2008). Cesarean section rates are highest in

China, Puerto Rico, Latin America, the United States, and most other industrialized countries in that order, with China reporting the highest rates globally of CS of up to 46% (Zhang et al., 2008). Kenya reported the highest rate of CS in Sub-Saharan Africa, with national rates of about 6.7% and up to 13.9% in the urban areas; all other Sub-Saharan African countries have cesarean section rates lower than 5% (Gibbons et al., 2012). Kenya's rate may not have reached the critical levels above 15% and proactive measures are essential to maintain healthy levels and prevent unnecessary CS incidences.

Most prior studies have focused on planned CS that was medically or obstetrically indicated for various reasons (Betrán et al., 2007; Liu et al., 2007; Oyelese & Smulian, 2006; Zhang et al., 2010). These reasons include history of previous CS (Menacker, 2005), placenta previa, accreta (Wu, Kocherginsky, & Hibbard, 2005), abnormal presentations (Carayol, Blondel, Zeitlin, Breart, & Goffinet, 2007; Roman et al., 2008), umbilical cord abnormalities such as prolapse (Livermore & Cochrane, 2006), multiple pregnancy (MacDorman, Menacker, & Declercq, 2008), and macrosomia (Henriksen, 2008). Other reasons include preexisting medical conditions such as diabetes (Ricart et al., 2005), obesity (Chu et al., 2007), pre-eclempsia (i.e., pregnancy-induced hypertension together with proteinuria), hypertension, HIV/AIDS, genital herpes or papilloma, and Crohn's disease, uterine malformation, and other birth defects (Chaudhary & Salhotra, 2011; Gilliam, 2006). These medical and obstetric conditions have formed the bulk of studies for indications of CS.

Elevated rates of severe morbidity and mortality have been observed among women undergoing elective cesarean section (ECS) when compared to vaginal birth

(VB). These elevated rates have been reported in Latin America (Villar et al., 2006) and in France (Deneux-Tharaux, Carmona, Bouvier-Colle, & Breart, 2006) and the United Kingdom (UK) where a study reported the risk of mortality of undergoing ECS delivery to be as nearly three times the risk of a vaginal delivery (Hansen, Wisborg, Uldbjerg, & Henriksen, 2008). In addition, mortality and morbidity risks to the fetus associated with CS include uterine wound infections (Deneux-Tharaux et al., 2006), transitory tachypnea, birth asphyxia, eclempsia, respiratory distress, and thromboembolism. (Chongsuvivatwong et al., 2010; Jain & Dudell, 2006; Liu et al., 2007). Cesarean section also carries a higher risk of neonatal and infant intensive care admissions and deaths compared to vaginal births (MacDorman et al., 2006).

The increased incidences of ECS (Liu et al., 2007; Miesnik & Reale, 2007; Stanton & Holtz, 2006) has a major contribution to the overall CS rates (National Institute of Health [NIH], 2006) with more women asking for CS outside any medical and obstetric indications (Betrán et al., 2007). Determining what fraction of this increase is apportioned to ECS is difficult, but crude international estimates ranging from 4-18 % have been suggested (Lobel & De-Luca, 2007; Wiklund, Edman, & Andolf, 2007). The rising incidence of cesarean deliveries on maternal request (CDMR) affects the health of the larger population by diverting limited healthcare resources. It also puts women and fetuses at increased risk for preventable morbidity and obstetric risks such as still births, placenta previa, placenta accreta, and uterine rupture in successive pregnancies (Gilliam, 2006; Liu et al., 2007; Miesnik & Reale, 2007); as a result of these factors, CMDR is not ethically justified (Gibbons et al., 2012). Although incidence data on these diseases in

Nairobi is limited, various estimates indicate high rates (1 in 13600) of placenta previa (U.S. Census Bureau, International Data Base, 2005) and stillbirths (22 in 1000 births) in Kenya (Cousens et al., 2011). In Nigeria incidence rates of placenta accreta (1 in 282) in south eastern region (Umezurike & Nkwocha, 2007) and uterine rupture (1 in 106) at the Teaching Hospital in University of Nigeria (Ezegwui & Nwogu-Ikojo, 2005) have been recorded; and in most other developing countries 1 in 1000 incidence rate of uterine rapture have been reported (Lombaard & Pattinson 2006).

Understanding predictors and reasons for choosing cesarean birth in Nairobi in a psychosocial model is a crucial step in managing and controlling the CS rates in Kenya. The factors that contribute to women's intentions for CMDR, including sexuality, self-image, self-control, social support, knowledge, and other psychosocial behaviors is thus required. In examining the psychosocial determinants of ECS in Nairobi, the study would have social change effects in contributing to the knowledge in this field in terms of understanding the relative contribution of psychosocial factors influencing maternal decisions for ECS. In addition, the study would help inform development of guidelines that will inform the practice of ECS in Kenya.

Problem Statement

In the context of worldwide increasing CS rates, reducing ECS rates is a feasible public health target with the goal of maintaining the overall CS rates at or below 15% of all births. The reasons for ECS are less studied yet risks from ECS in which the woman has direct role can be reduced significantly through known public health strategies such as the appropriate management of last stage of labor, maternal education, and counseling

on the correct level of safety and to allay their fears on the birth process. Studies associate undergoing CS to greater risks including greater postpartum hemorrhage or excessive blood loss, damage to internal organs, progressive loss of future reproductive capability, and lower psychosocial attachment to the infant and breastfeeding quality compared to VD.

A review of literature shows that women consider elective CS for several psychosocial reasons many of which however, are interconnected covariates, making it difficult for women and public health clinicians to decipher and address the predictive influences. These include women's personality traits (e.g., autonomy, self-control/self-esteem and confidence in the birthing process); tocophobia or fear of labor pain and child birth; avoidance of perceived labor pain; perceived preservation of sexual function; satisfaction with social support; depression, stress, and anxiety (from birth expectations/prospects); and social convenience. Understanding to what extent these factors interact, as well as collectively and relatively predict ECS therefore has an important social effect and is the focus of this study. The study seeks to examine through logistic regression of key psychosocial driving factors for the increasing ECS cases with particular reference to pregnant women in maternity centers in Nairobi.

Purpose of the Study

The purpose of this quantitative study is to examine the psychosocial factors that determine women's choice of mode of delivery (MoD) in two selected obstetric facilities in Nairobi, Kenya – Pumwani Maternity Hospital (PMH) and Kenyatta National Hospital

(KNH). The study also sought to determine to what extent a set of psychosocial factors can significantly predict ECS in a logistic regression model.

Research Questions and Hypotheses

The two central research questions are: What are the factors that determine women's choice for ECS over VD? How well do these factors predict ECS? Subquestions or Specific research questions are:

Research Question 1: Does the incidence rate of cesarean section deliveries (including elective cesarean sections) in two obstetric facilities in Nairobi (KNH and PMH) meet the United Nations (UN) and National Institute of Health (NIH) recommendation of at or below 15%?

H_{01}: Incidence rate of CS > 15%

H_{A1}: Incidence rate of CS ≤ 15%

Research Question 2: Is the proportion of CS deliveries that are elective greater than the median proportion of 5% in Nairobi?

H_{02}: Incidence rate of ECS ≤ 5%

H_{A2}: Incidence rate of ECS > 5%

Research Question 3: What are the main psychosocial predictors for ECS deliveries in Nairobi?

Research Question 3a: Are a woman's personality traits, as measured by the ACS-30, CBSEI-C32, and RSE, associated with ECS?

H_{03a}: There is no association between ECS and a woman's personality traits as measured by the ACS-30, CBSEI-C32, and RSE.

H_{A3a}: There is an association between ECS and a woman's personality traits as measured by the ACS-30, CBSEI-C32, and RSE.

Research Question 3b: Is there an association between a woman's sexual function, as measured by the BISCS and FSFI, and ECS?

H_{03b}: There is no association between a woman's sexual function, as measured by the BISCS and FSFI, and ECS

H_{A3b}: There is an association between a woman's sexual function, as measured by the BISCS and FSFI, and ECS

Research Question 3c: Is there an association between ECS and a woman's fear of childbirth as measured by the W-DEQ?

H_{03c}: There is no association between ECS and a woman's fear of childbirth as measured by the W-DEQ

H_{A3c}: There is an association between ECS and a woman's fear of childbirth as measured by the W-DEQ

Research Question 3d: Is there an association between ECS and perceived labor pain as measured by the SF-MPQ?

H_{03d}: There is no association between ECS and perceived labor pain as measured by the SF-MPQ

H_{A3d}: There is an association between ECS and perceived labor

pain as measured by the SF-MPQ

Research Question 3e: Is there an association between ECS and perceived

social support as measured by the MSPSS?

H_{03e}: There is no association between ECS and perceived social

support as measured by the MSPSS

H_{A3e}: There is an association between ECS and perceived social

support as measured by the MSPSS

Research Question 3f: Is there an association between ECS and a woman's

pregnancy-related emotional health status?

H_{03f}: There is no association between ECS and a woman's

pregnancy-related emotional health status

H_{A3f}: There is an association between ECS and a woman's

pregnancy-related emotional health status

Research Question 3g: Is there an association between ECS and social

convenience factors (ease of planning the day of delivery, time of delivery,

maternity leave and work schedule, length of delivery process, and ready

availability of the delivery services)?

H_{03g}: There is no association between ECS and social convenience

factors

H_{A}: There is an association between ECS and social convenience

factors

Research Question 4: Is elective cesarean section delivery predicted by a set of psychosocial factors among women attending prenatal services in the two selected maternity hospitals (KNH and PMH) in Nairobi in a multiple logistic model?

H_{04}: Psychosocial measures do not predict the incidence of ECS among pregnant women in KNH and PMH

H_{A4}: Psychosocial measures predict the incidence of ECS among pregnant women in KNH and PMH.

Theoretical Framework

The study was guided by the principles derived from two psychosocial theories: the social ecological model (SEM) by Bronfenbrenner (1994) and the Ajzen's (1991) theory of planned behavior (TPB). The social ecological model highlights the interwoven interaction between and the interdependence of factors across and within five different levels of influence on a health problem (Rimer & Glanz, 2005); thus, intrapersonal or individual factors, interpersonal factors, institutional factors, community factors, and public policy factors. Considering cesarean section delivery is determined by many factors including psychosocial status, maternal characteristics, healthcare infrastructure and policy, the SEM being multilevel and interactive, provides a valuable framework for understanding the intrapersonal psychosocial determinants for ECS deliveries (Cruz, Guhleman, & Onheiber, 2008) in a social environment characterized by the type and strength of social relationships, social integration and social networks.

The theory of planned behavior is developed from the theory of reasoned action (TRA). The theory of reasoned action postulates two conceptual determinants of intention

for a health behavior: the attitude toward the behavior, or the extent, to which the behavior is valued negatively or positively, and the subjective norm, or the perceived social pressure whether or not to engage in the intended action. TPB adds a third conceptual determinant called perceived behavioral control - one's ability to execute a given action in order to address the limitation of the TRA's inability to explain behaviors that are not purely volitional (Ajzen, 2012). The TPB thus takes into consideration that certain factors for a woman's choice for a MoD are beyond their volitional intentions. Many other interpersonal (such as approval by the doctor, spouse or peer) and socio-ecological factors (presence of maternity facility, financial ability, social norms, and social networks) often influence the execution of a woman's intention for a particular MoD (Robson et al, 2009; Thompson, 2010). The TPB therefore provides a good theoretical framework to predict and get a better examination of the intentions, behaviors and actual outcome of birth choice, which can be assessed by seeking response from pregnant women to a set of ten psychosocial scales.

Nature of the Study

The study was carried out on a systematic random sample of expectant mothers attending prenatal services in two of the main maternity hospitals in Nairobi. In a prospective cohort study design, expectant women in their third trimester (28-36 weeks) who were attending prenatal services in two government maternity hospitals (Pumwani Maternity Hospital and Kenyatta National Hospital) were interviewed for various psychosocial behaviors and followed for their MoD. A sample size of 1,400 women was determined using the principle of probability proportionate to size (PPS) of the hospital

admissions. The sample size was based on moderate strength of correlation coefficients for 10 predictors, power of 80%, 5% *alpha* (Burkholder, 2009), and an estimated prevalence of ECS of 5.0% - the median cesarean section rate. A structured questionnaire that consisted of mainly 10 psychosocial scales was then administered to the participants prenatally. The scales included: the Autonomy Connectedness Scale (ACS-30), the Rosenberg Self-Esteem Scale (RSE), Wijma Delivery Expectancy/Experience Questionnaire (W-DEQ), Short-form McGill Pain Questionnaire (SF-MPQ), Body Image Self-Consciousness Scale (BISCS), short form of the Childbirth Self-Efficacy Inventory (CBSEI-C32); and the Female Sexual Function Index (FSFI), the multidimensional scale of perceived social support (MSPSS), Edinburgh Postnatal Depression Scale (EPDS), State-Trait Anxiety Inventory (STAI), and Affect Intensity Measure (AIM). After follow-up from hospital records and post-natal phone interviews, the MoD was analyzed against significant psychosocial factors (scores) in a multiple logistic regression model.

Definition of Terms

Apgar score: A complex index that numerically express an infant's condition (0-2 scores), usually determined at 60 seconds after birth, based on respiratory effort, heart rate, muscle tone, response to stimulation, and skin color.

Assisted vaginal birth: The use of forceps or vacuum to facilitate a vaginal birth.

Birth order: The number (ordinal) of a particular live birth in relation to all the previous live births to the same woman.

Bishop score: A score indicating the prospects of induction of labor, assigned according to the on consistency of the cervix, the extent of cervical dilatation, the station of the fetal head, effacement, and the cervical position in relation to the vaginal axis.

Cesarean section: The delivery of a baby by making surgical incisions in the woman's abdominal wall and uterus.

Confidence: The feeling of being able to engage in an expected health behavior.

Dorsal lithotomy position: A position taken by a woman during gynecologic examination or child birthing lying flat on the back with raised and bent knees, spread out legs, and feet rested on a surface for support.

Episiotomy: A surgical operation to enlarge the vulva and perineum during VD.

Elective cesarean section: CS done without satisfactory medical or obstetric reason.

Elective induction of labor: An endeavor to forestall the spontaneous onset of labor, by without a medical indication.

Fecal incontinence: Incapability to hold feces in the large intestine as a result of the failure of voluntary control over the anal sphincters that control bowel movements, permitting untimely leakage of feces and gas.

Gravida: The number of the pregnancy that the woman is in. Thus primigravida (gravida I), secundigravida and tertigravida are woman in their first, second and third pregnancies respectively. A multigravida is a woman who has had one or more previous pregnancies.

Intention: The expressed willingness of one's readiness to conduct a given behavior; regarded as an immediate precursor of the behavior.

Natal: Relating to birth. Prenatal and antenatal refer to that which is concerned with, or occurring during pregnancy; perinatal means occurring during the period around birth (5 months before and 1 month after), and postnatal means occurring (immediately) after child birth.

Parity: The number of live-born children delivered by one woman. A woman is nulliparous (a nullipara) if she has never given birth, primiparous (a primipara) if she has given birth to only one child, and multiparous (or pluriparous) if she has given birth two or more times. Based on the number of offspring expected in a birth, a woman is uniparous if she has a singlet pregnancy in one birth and multiparous (a multipara) if she has more than one offspring such as twins (biparous) in one birth.

Partum: Birth. Ante partum means occurring before childbirth, postpartum means occurring after childbirth (time period following childbirth), and puerperium means a woman's state during childbirth or immediately thereafter (approximately six-week period from time of childbirth to the return of normal uterine size). Intra-partum is that relating to childbirth.

Pelvic floor: A group of muscles that form the soft tissues enclosing the pelvic outlet or abdominal cavity.

Pelvic floor dysfunction (PFD): A range of disorders of the pelvic floor experienced due to the weakening or injury of the pelvic muscles and connective tissues.

PFD includes any of clinical conditions such as pelvic organ prolapse, fecal or urinary incontinence and among others.

Pelvic organ prolapse (POP): An abnormal fall or bulging of pelvic organ or structures such as the uterus, cervix, vagina, or peritoneum from their normal attachment sites or their normal position in the pelvis.

Perineum: The portion of body in the pelvis (scrotum in males and vulva junction in females) that is occupied by urogenital passages and the rectum.

Placenta accreta: A severe obstetric complication that involve deep attachment of the placenta into the inner layers of the uterine wall.

Placenta previa: An obstetric complication involving the adherence of the placenta to the uterine wall close to or enveloping the cervix to the extent that it may come out first before the child during delivery. This may lead to severe maternal hemorrhage.

Referent: A spouse, family member, relative, close friend, or community member that the individual considers part of their social support network.

Stages of labor: The three stages that characterize progress during childbirth labor. In the first stage of labor, the uterine contractions open (dilate) the cervix for up to 12 hours or more depending on the parity. During the second stage of labor, that lasts for between a few minutes and two hours, the baby is pushed out from the uterus through the birth canal. The third stage, that lasts about 10-20 minutes, is the period when the placenta is delivered.

Self-efficacy: explained by Bandura (1977) as the belief or confidence in a person's ability to plan and perform a course necessary for performing a specific action.

Significant other: A person who is important or influential in one's life such as a spouse or lover, family member, or close friend.

Socioeconomic status (SES): A complex construct developed from multiple indicators including family income, education, and occupation.

Social network: A web of social relationships or ties that surround a person such as marital, kinship, residential, occupational, and welfare group interactions.

Social support: Assistance or care provided by other persons in form of advice, information, aid, companionship, and nurturing or intimate appraisals.

Stress incontinence: A condition in which one loses urine without effort while performing a physical exercise or activity such as sneezing, laughing, or coughing due to insufficient strength of the pelvic floor muscles.

Trimester: A period of three months each of human pregnancy. Thus, first trimester refers to the period from the onset of the last menstrual cycle to 12th week of gestation; second trimester is the phase from 13th through 27th week of gestation, and third trimester is the last phase from the 28th gestation week until child birth.

Uterine rupture: A complete separation of the wall of the uterus involving tear of the inner uterine wall layers (endometrium and myometrium) and the overlying serosa (outer uterine layer) during pregnancy or childbirth (Guise et al., 2004).

Uterine scar dehiscence: The separation of a pre-existing scar without disrupting the overlying visceral peritoneum or uterine serosa or significant bleeding from its edges.

Urinary incontinence: The seeping out of urine from the bladder involuntarily due to inability for bladder control.

Valsalva maneuver: A forcible exhalation of a person with a closed windpipe to avoid air escaping through the mouth or nose. The Valsalva maneuver obstructs the venous blood from returning to the heart.

Assumptions

It is assumed that this study was grounded on a sound theoretical base consisting of the TPB and the SEM. It was assumed that cesarean section is a real public health problem in Nairobi and elective cesarean section as clearly defined in the study contributes significantly to its incidence.

It is assumed that the psychosocial indicators investigated in this study were reliably measurable with the instruments proposed, and that VD, ECS and nonelective cesarean section (NECS) categories of delivery in this research are distinctive enough to meet the assumption of the independence of irrelevant alternatives for a multiple logistic regression. It is also assumed that nearly all the crucial factors with most probable contribution in literature were accommodated in the study tool and that the study participants responded to the questionnaires truthfully and to the best of their ability.

Scope and Delimitations

Although certain cesarean operations are performed at the advice or instigation of the doctor, the scope of this study is limited to cesarean section operations performed at the behest of the pregnant woman. The study did not include cases with medical or obstetric indication, but focused on the woman's expressed willingness for cesarean

section based on the presumably avoidable or modifiable psychosocial factors. The

design is cognizant of the fact that the physician's attitude has some effect on the MoD

that is finally adopted, but it is assumed that this influence is balanced for both vaginal

and cesarean delivery (Weaver & Statham, 2005), and this paternalistic or physician-

patient influence is outside the scope of this study.

Limitations

The study will be conducted among women (18-49 years) who are coming from

different urban settlements to attend prenatal services (3rd trimester) and followed up

postnatally (on the 6th week postnatal appointment) in two government

hospital/maternity facilities in Nairobi. Generalization of the study findings is limited to

those using the national health facilities in Nairobi city and not to the semi-urban

community and rural set-ups.

Inherent in the design of this study (prospective cohort) is that the study can only

identify predictive factors associated with the postulated MoD. The internal validity is

also lower for such observational studies than experimental studies since complete

randomization is not possible. Selection bias may result from loss to follow-up of

participants, but adequate steps were taken to maximize retention rate and overall rate of

participation.

Summary and Transition

In this chapter, the different sections of the study background are outlined, problem, concepts and research plan. The chapter establishes that cesarean section is a significant public health problem on the increase worldwide (Betrán et al., 2007), regionally (Sufang et al., 2007) and locally despite the associated risks (Carayol et al., 2007; Jain & Dudell, 2006; Larsson et al., 2006; Villar et al., 2006). Although, most of the cesarean section incidences are medically or obstetrically indicated, elective cesarean section is suggested to contribute significantly to the rising rates and the need to determine determinants of ECS is put forth. ECS rates are unnecessarily high especially in the urban and private hospitals (ACOG, 2007; Liu et al., 2007; Lobel & De-Luca, 2007; Wiklund, Edman, & Andolf, 2007). Only a few quantitative studies have investigated the psychosocial factors that predict a woman's choice of MoD (Lin, & Xirasagar, 2005) and most studies on cesarean section deliveries are qualitative (Pang et al., 2007; Stanton & Holtz, 2006). Grounded in the social ecological model and theory of planned behavior, this study examines through multiple logistic regression of identified key psychosocial factors predictive for ECS in public and private hospitals in Nairobi.

Chapter 2 discusses a review of research literature in elective cesarean section and identifies key findings, methodological and/or contextual limitations and research gaps from these research articles. The review focuses on key psychosocial factors previously found to influence ECS such as maternal autonomy and control, fear, pain avoidance, maintenance of sexual function, social support/networks, personality and social convenience.

       Chapter 3 presents the research methodology describing the design, set-up, sample, as well as the research tools to be used in the study. The instruments focus on specific psychometric scales used in the different psychosocial measures for the hypothesized predictors of ECS. The plans for multiple logistic regression analysis of the various psychosocial factors and outcomes as well as plans for ethical protection of participants are also described.

Chapter 2: Literature Review

In chapter 1, the dearth of quantitative studies that have examined the contribution of various psychosocial factors to elective cesarean (ECS) incidences despite the public health significance of the rising CS rates in cities was established. The purpose of this study is to examine the psychosocial factors that determine women's choice of MoD and their predictive value in elective cesarean deliveries in obstetric facilities in Nairobi, Kenya.

Presented in this chapter, is a review of research literature in the area of ECS and discussion of key findings from these articles and their methodological and contextual limitations, identifying the research gaps that finally informed the problem statement. The chapter is organized into 8 subheadings, beginning with the introduction to the chapter and ending with a conclusion and a brief account of the research problem. The subheadings are organized as follows: historical origin of cesarean section, discussion on the prevalence and trends of CS rates- global, regional and the limited information at the national level, as well as a review of the obstetric and medical indications for cesarean section. A substantive section is reserved for a review of eight psychosocial factors previously found to influence ECS either in qualitative or quantitative studies including: maternal autonomy and control, fear, pain avoidance, maintenance of sexual function, familial and social networks, personality (self-esteem and self-image), and convenience. The section is then followed by a discussion of the methods used in the previous studies, identifying any limitations and strengths relevant to this study.

Literature Search Strategy

The review involved conducting a search of the four major databases: Walden University's Academic Search Premier, Medline, CINAHL and Google Scholar to identify publications relevant to the topic, with priority to original peer reviewed research articles from January 2005 to date. The search also included checking the reference lists of the primary articles and retrieving any key articles and web reviews limited to the past 10 years of publication in order to capture only literature relevant to recent developments. In addition, classical works that would have been missed in the original search were included for background information and psychosocial tests/methods even if they had a publication date older than 10 years.

The review adopted the core search phrase terms: *elective cesarean section* or *cesarean section maternal request*. Also incorporated in further search were the terms: *patient preference delivery mode*, *maternal choice cesarean section*, *cesarean section on demand*, and "*non-indicated Cesarean births*. Articles selected for inclusion in the review focused on elective or planned cesarean section as requested or demanded by pregnant women without any medical/clinical or obstetric indications. The papers were organized into specific themes hypothesized as psychosocial determinants of elective cesarean section, risk factors, theory, methods and history, and were saved in separate subfolders under the main briefcase of Literature Review.

Published research articles that explored maternal request for cesarean deliveries were selected for inclusion. The journals were reviewed and evaluated for

content and for measures of validity and reliability. Recurrent psychosocial factors

and reasons for ECS were identified and organized into distinct subheadings around

which the literature was systematized. Studies published before 2005 and literatures

pertaining to doctor's choice for cesarean section involving medical or obstetric

indications were excluded from this review. The review therefore focused on specific

factors that influence women to ask for cesarean section when spontaneous vaginal

birth would otherwise be a suitable MoD. Research studies that examines patient-

requested cesarean section in developing African countries and Kenya in particular

were initially planned for attention in this review, but due to scanty material in many

countries, the bulk of the literature borrow from research articles from the Middle and

Southeast Asia and North American countries.

Theoretical Foundation

The study was grounded on theories of the SEM (Bronfenbrenner, 1994) and

the TPB (Ajzen, 1991).

The Social Ecological Model

Description. The SEM is an interactive and multilevel strategy to assessing the

determinants of health behaviors and outcomes (Cottrell et al., 2009). The SEM

underscores the interdependence and interwoven interactions of factors in all levels of

a health problem (Rimer & Glanz, 2005). The ecological perspective acknowledges

the fact that health behaviors and conditions are part of a larger system that is better

tackled from multiple levels. The SEM classifies five different levels of influence on

health behavior but that can be condensed into three levels (Rimer & Glanz, 2005):

1. Intrapersonal or individual factors, which consist of personal characteristics that shape behavior; for example, knowledge, attitudes, and beliefs as well as personality traits.

2. Interpersonal factors that consist of person-to-person developments and the primary groups such as peers, friends, and family, that provides role definition, social identity, and social support.

3. Community level factors including:

   a. Institutional/organizational factors that include the rules, policies, regulations, and informal formations, which may either promote or constrain intended behaviors.

   b. Community factors that include informal or formal regulated social networks and norms/standards among organizations, groups, and individuals.

   c. Public policy factors that encompass local, national, as well as international laws and policies that guide the intended healthy behaviors for prevention, early detection, control, and management of the health risks.

Justification. The SEM was chosen to form the theoretical framework because of its encompassing multilevel and interactive approach (Cottrel et al., 2009). The SEM provides a valuable framework for understanding the intrapersonal psychosocial determinants for CS deliveries (Cruz, Guhleman, & Onheiber, 2008) in a social environment as influenced by interpersonal and community level factors such as

social relationships, social integration and social networks. Humans as social beings have their behavior strongly affected by the social environment. Behavioral choices and intentions such as mode of child delivery can either be reinforced or maintained by features of the social environment that are within and without a person's control (Cifuentes et al., 2005). Changes in interpersonal sphere - including social capital or social relations and networks (Kawachi, 2006, 2008; Moore, Shiell, Hawe, & Haines, 2005), and occupational, community as well as public policy factors will motivate an individual's performance of the intended health behavior. In this study pregnancy is defined as an important social event whose progression depends on the woman's psychological status and her social surrounding. The MoD and birth outcomes like many modern health outcomes result from an intricate interaction of factors such as personal, behavioral, social, and economic determinants over the course of the woman's life.

The study considers that the event of a cesarean section is determined by many factors. Besides the psychosocial status of the woman such as socio-economic status (Tang, Li, & Wu, 2006), depression, anxiety of childbirth, sexuality and fear of birth, maternal characteristics such as education, weight, age and parity are also important. CS deliveries are also influenced by institutions (such as maternity centers, professional associations, and workplace), other persons (such as social partners, peers and relatives) and public policies (on pregnancy and delivery management, risks assessments, prenatal and postnatal care system, and insurance cover) all of which together help the individuals make the choices for a vaginal or cesarean birth in

their daily lives' events (Rimer & Glanz, 2005; McKenzie et al., 2009; Scioscia et al., 2008).

The woman's access to social support network in terms of friends, family, and community structures that a person can go to for help, reassurance, counsel, and solace, is a significant determining factor of her health status (Moore, Shiell, Hawe, & Haines, 2005; Seigel & Lotenberg, 2007). Arjun (2008) highlighted that the type of institution (whether public or private and whether teaching or non-teaching), and type of practice (whether solo or group), socio-economic status of the client, and all-time availability of auxiliary support services (such as pediatric, anesthetic and blood bank services) are important determinants of MoD and interact to raise the rates of cesarean section deliveries (Scioscia et al., 2008).

Patient and physician factors, such as convenience (choosing a convenient time of the day and/or day of week for delivery) or monetary enticements have been suggested to account for variations in CS rates (Tang, Li, & Wu, 2006). Some studies have reported significantly lower CS rates on weekends and at night (Stamer, Wiese, Stüber, Wulf, & Meuser, 2005; Epstein, Ketcham, & Nicholson, 2008) to convenience the schedule of the practitioner and sometimes the client.

Theory of Planned Behavior

Description. The TPB is derived from the theory of reasoned action (TRA) with an additional third conceptual determinant of intention for a health behavior - perceived behavioral control (Ajzen, 2012). The addition is to address the limitation of the TRA's inability to elucidate behaviors that are not purely volitional. According

to TPB, a person's intention to practice given behaviors is a function of three

conceptual constructs:

1. Attitude toward the behavior: the extent to which the behavior is valued

    negatively or positively. Linked to the expectancy value model or Bandura's

    outcome expectancies (Bandura, 2007), the attitude towards a health behavior

    is established by the total set of available beliefs that link the behavior to the

    perceived benefits or advantages and disadvantages of various outcomes

    (Ajzen, 2012) or to the value one attaches on a particular outcome (Blalock,

    Beard, & Dusetzina, 2010). The stronger the beliefs about attributes or

    positive outcomes on executing the behavior, the more positive the attitude

    towards the particular behavior (Montano & Kasprzyk, 2008) and vice versa.

2. Subjective norm: the perceived social pressure whether to involve oneself in

    the intended behavior or not (Ajzen, 2012) arising from sexual partners,

    friends, peers, parents, supervisors, colleagues, role models, as well as

    professionals. Individuals who perceive such persons as important in their

    lives and believe that they approve of their behaviors, are motivated to

    perform the intended behaviors in order to meet the referent's expectations

    and so will have a positive subjective norm (Carmeli, & Schaubroeck, 2007).

    The converse also holds for negative subjective norms.

3. Perceived behavioral control: one's perceived capability to execute a

    particular behavior (Ajzen, 2012), similar to the self-efficacy concept in social

    cognitive theory (Bandura, 1977). Greater perceived behavioral control

motivates a person's intention to perform the specific behavior and without perceived control, intentions may be weak even if attitudes towards the behavior and subjective norm were strong. Perceived capability to execute a behavior is a prerequisite to realizing a desirable health behavior (Ajzen, & Manstead, 2007).

Justification. The TPB is selected over the TRA for its capability to take into account the fact that some factors that define a woman's choice for a MoD are beyond their volitional intentions. Even though, some researchers are of the view elective cesarean section should be purely a personal informed decision after sufficiently considering the associated benefits and risks, both to the mother and the infant, many other interpersonal (e.g., approval by the doctor, spouse or peer) and social environmental factors (e.g., access to the facility, financial ability, social norms, and social networks) often influence the execution of such an intention (Robson et al, 2009; Thompson, 2010). TPB therefore provides a good theoretical framework to predict and get a better examination of the intentions, behaviors and actual outcome of birth choice, which was assessed by administering to participants a questionnaire composed of a set of specific psychosocial scales. It should be noted that the expression of a desire for a particular MoD (vaginal or cesarean) does not necessarily end up in that MoD (Pang, Leung, Lau, & Chung, 2008). This observation underscores the value of the third construct of TPB, that the woman's ultimate MoD goes beyond her intention to give birth through a cesarean or vaginal mode and her attitude towards the particular MoD, and includes her perceived level of

behavioral control during the delivery process. The stronger the level of perceived control, the more likely the woman will carry out the intended choice of delivery (Ajzen, 2012).

Conceptual Framework

Based on social epidemiology theories, the convergence of factors (physiologic stress, psychological state, personal traits, sexual behaviors, and social interaction) that link social conditions to important health outcomes call for an epidemiologic approach to understanding delivery outcomes that incorporates social experiences as a more direct determinant than is the customary view in the field of reproductive health. The conceptual framework is hinged on the multiplicity of factors that affect ECS decisions at different levels (individual, interpersonal and community) in a social environment (Cottrel et al., 2009), and the fact that individual maternal decisions for a MoD is not entirely volitional (Ajzen, 2012). The framework provides the basis for determining the psychosocial factors using logistic regression models in the study to develop a predictive model for ECS selection and eventual design of prevention activities to maintain optimal CS rates.
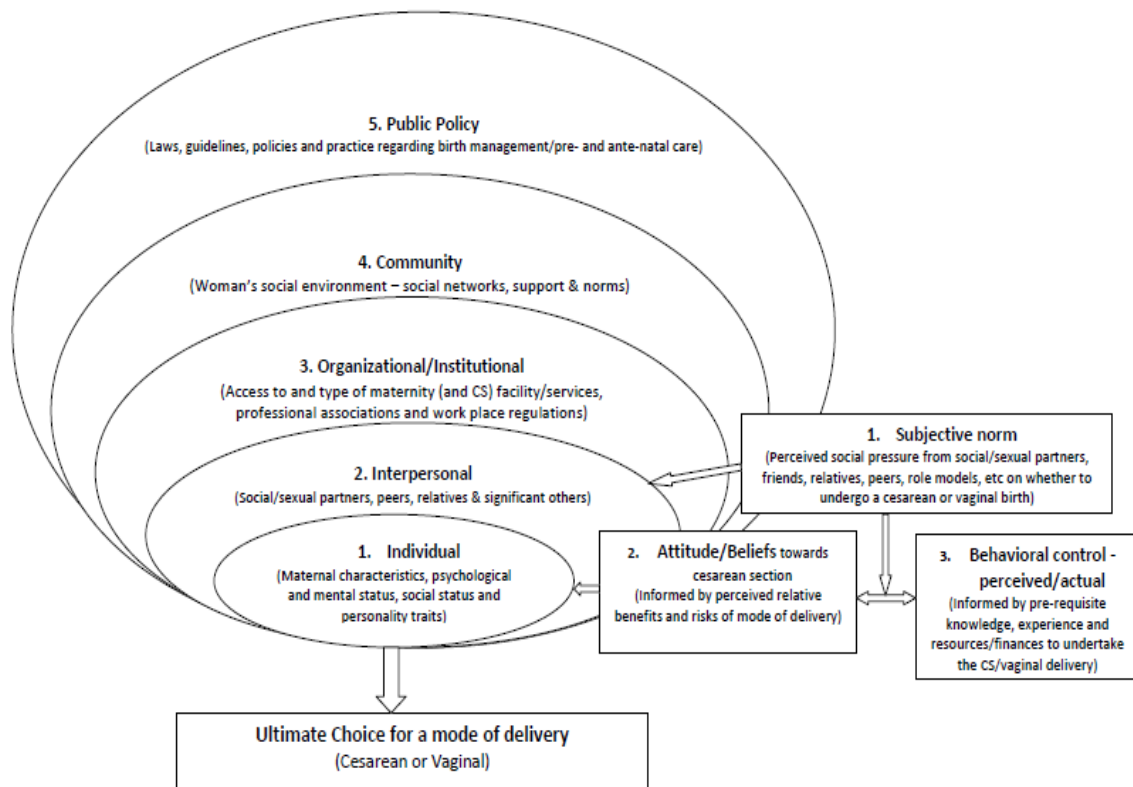
*Figure 1.*Conceptual model explaining the psychosocial determinants of cesarean section deliveries.

Historical Origin of CS Deliveries

A review of medical history of CS operations makes numerous references in ancient Roman, Egyptian, Hindu, Grecian, and other European legends, discounting the contemplation that the Roman leader Julius Caesar was delivered by this surgical procedure in 100 BC, and so the operation was named after him(Todman, 2007). This is owing to the fact that Caesar's mother lived many years after he was born, at a time when the operation would most probably have caused her death (Todman, 2007, p.357). The Roman law of the eighth century BC that later ordered CS procedure in

final few weeks of gestation in dying mothers to save the infant's life provides the

most likely version of its origin (van Dongen, 2009, p.62). The Latin terms *caedare*,

which means to cut, and *caesones* applied at that time to infants delivered by

postmortem operations, provide other possible origins (Todman, 2007, p.357). The

earliest cases of successful cesarean sections were performed in remote rural settings

that lacked appropriate surgical facilities and medical personnel (Walsh, 2008). The

first written account of a mother and baby pair surviving a CS probably came from

Switzerland in 1500 when a sow-gelder conducted the procedure on his wife after

extended days in labor (Van Dongen, 2009, p.64). In East Africa for example, there

are reports of a CS performed successfully by Kahura traditional healers in Uganda in

1879. Similar reports are recorded from Rwanda, where plant concoctions were also

used as anesthesia and to promote wound-healing after CS (Todman, 2007; Van

Dongen, 2009).

The origin of cesarean section deliveries relate to the difficulties experienced

in human child births that are explained by Hardy's Savanna and Aquatic ape theories

of bipedalism evolution (Moalem, 2007, pp 200-212). Structurally, the cause of

childbirth difficulties in humans is traced to what some researchers refer to as the

triple threat of a twisted pelvis designed for walking, backward facing of babies at

birth (Walsh, 2008; Wittman, & Wall, 2007) such that the head comes out first, and

big brains with associated big heads, which led to the general human tradition of

assisting one another with delivery – birth attendants and obstetricians, and birth

through cesarean sections. Hardy, a marine biologist, had put forward a controversial

explanation as early as in 1960 linking some anatomical modifications to a possible early aquatic life that allowed humans to remain afloat in water and more buoyant (Moalem, 2007).

Prevalence of CS Deliveries

Global Rates for CS Deliveries

Secular trends of CS. Analysis of national, regional, and global CS rates by Betrán et al. (2007) found that despite the uneven distribution and wide variation by continent, region and country, 15% of births occur by CS globally. Many countries exceed the recommended rate of 15% or below but rates vary from 0-46% (Sufang et al., 2007). In the developed countries, an average 21.1% of births are cesarean sections, with rates as high as 31.1% in the United States in 2006 (Hamilton, Martin, & Ventura, 2007). Latin America and the Caribbean countries showed the highest median rate of 29.2% while Africa had the lowest median rate (3.5%). There was a strong correlation between CS and mortality rates (neonatal, infant, and maternal) in nations that reported elevated mortality rates (Betrán et al., 2007).

Cesarean section rates are generally high in China, Puerto Rico, Latin America, the USA, and most other industrialized countries. China has the world's highest incidences of CS with up to 46% of babies delivered through cesarean section (Zhang et al., 2008). In 2004, the rate of cesarean section deliveries was 20-21.5% in the UK, slightly higher in Canada, at 22.5% in 2002 and above 30% in Australia (Robson et al., 2009).

In Brazil the rate of CS is the second highest in the Latin America reaching 35% in public hospitals and much higher (more than 80%) in the majority of the private hospitals (Betrán et al., 2007; Ronsmans, Holtz, & Stanton, 2006). In the United States, the Department of Health and Human Services (DHHS) targeted to establish CS rates at 15% by 2010(ACOG, 2007) but the rate remained high, at more than 31%, despite dropping significantly from 48% in 1996 (CDC, 2009).

Dietz (2005) identified four main demographic factors contributing to the elevated rates of CS in western societies: the reducing trends for morbidity and mortality related to CS; increasing secular trends of obesity (BMI) and the advancing maternal age in the aging society, including the age at first delivery, which affects pelvic floor morbidity (Dietz, 2006); and the advancing knowledge of the distressing outcomes of vaginal childbirth.

Threshold for CS rates. In tandem of United Nations agencies researchers recommend that CS rates should be between 5 and 15% in a country and supports further research on the subject (Althabe et al., 2006; Ronsmans, Holtz, & Stanton, 2006; Gibbons et al., 2012). Given that these rates in many countries exceed the maximum recommended rate, cesarian section births have become a public health concern (Stanton, & Holtz, 2006). Increased incidence of elective cesarean sections (ECS) has been documented by Liu et al. (2007), as well as associated known risks to the baby and mother (Villar et al., 2006; Belizán, Althabe, & Cafferata, 2007). Women undergoing cesarean delivery face several risks including greater risk of damage to internal organs, blood loss, and post pelvic-floor dysfunction (Dietz,

2006), greater risk of mortality (Belizán, Althabe, & Cafferata, 2007) in addition to lacerations, respiratory distress syndrome and transient tachypnea to the infant.

McClure, Goldenberg, and Bann (2007) suggested that the rate of CS may be used as a process indicator in programs of safe-motherhood, when both stillbirths and maternal mortality decreased sharply at a time CS rates increased from 0-10%. Althabe et al. (2006) however, found that rates of more than 10% are not supported by scientifically established maternal medical indications while Gibbons et al. (2012) maintained that cesarean section rates should be between 5-10%. Suggestive evidence indicated cesarean section rates of 3.6 - 6.5% are necessary in addressing obstetric complications, and thus more CS services may be needed in West Africa (Althabe et al., 2006; Villar et al., 2006), unlike in Kenya where rates are likely to be on the increase and control is imperative.

The World Health Organization's cited CS rate threshold of 15% and the International Federation of Gynaecology and Obstetrics (FIGO) committee's recommendation against nonindicated CS operations (FIGO, 1999) have since guided most of the research and interventions on ECS. The National Institute for Health and Clinical Excellence (NICE) followed by issuing guiding principle supporting promotion of vaginal delivery under normal circumstances in the UK (NICE, 2004). There are indications that the World Health Organization is changing previous recommendations for 15% CS rates, stating lack of empirical evidence for the optimum rate and asserting that what is most important is to ensure that women who deserve cesarean section interventions receive them (WHO, 2009). According to the

United States National Institutes of Health (NIH), increases in CS rates *per se* should

not be reason for concern, but can reflect shifting patterns in reproductive health,

based on woman's preferences and desired birth outcomes (NIH, 2006).

Regional and National CS rates

   Trends in CS rates. In Sub-Saharan Africa, analysis of the demographic and

health surveys (DHS) indicate that cesarean section rates have remained lower than

five percent in all countries (Ronsmans, Holtz, & Stanton, 2006; Stanton & Holtz,

2006) except Kenya with CS rate of 6% in 2009 (KDHS, 2010), and increasing in the

urban areas reaching as high as 38.1% in one private city hospital (Wanyonyi,

Sequeira, & Obura, 2006). In a country profile, the Making Pregnancy Safer

Department of WHO (2007) indicated the population-based rate is however low

ranging from 0.1-4.0%. A survey in a rural community in Western Kenya, for

instance found a cesarean section rate of 2.0% (van Eijk et al., 2008). The low

population-based cesarean section rate signifies the unmet need for obstetric care and

may serve as useful monitoring tool for progress on safe-motherhood programs in

poor and rural settings (McLure et al., 2007).

   It is difficult to determine what fraction of this rising rate is attributable to

elective cesarean section and no information has been obtained to the effect in Kenya.

However, international sources (Lobel & De-Luca, 2007; Wiklund, Edman, &

Andolf, 2007) estimate elective cesarean section rates of between 4 and 18%. ECS

rates in the UK for example is estimated at 7.3% for all primary caesarean sections

(McCourt, 2007), and rates ranging from 2.6% to 34% in the Netherlands and Taiwan respectively (Jacquemyn, Michiels, & Martens, 2012; Hsu et al., 2007).

Cost of CS deliveries. The cost of one CS procedure in Kenya is huge and hospital sources indicate some parents are spending up to KES 400, 000 (US$ 5,000) per delivery and initial baby care in private hospitals in Nairobi (East Africa Standard, Friday, 24th October 2008) and an average of KES 8000 (US$ 100) in a government-run public hospital. Either case, these are enormous costs on the women and drain resources for other health care and family needs. Khan and Zaman (2010) recently conducted a hospital based comparative cost of vaginal and CS deliveries at a tertiary level public hospital providing free maternity care in Islamabad, Pakistan. The researchers found that CS on average costs four times more than a vaginal birth from the hospital side, excluding the hidden and unpredicted costs that are substantial. From the perspective of a patient, a spontaneous vaginal delivery on average costs US$ 79 compared to US$ 204 for a CS. The median cost from the hospital perspective for a CS was 10868 rupees (162 US$) and 13678 rupees (204 US$) from the patient's perspective (Khan, & Zaman, 2010). The cost of CS deliveries is many times higher and adds to the economic burden of motherhood and childcare. Gibbons et al. (2012) recently costed the global saving at US$2.32 billion by reducing CS rates to 15% noting that medically unjustified cesarean sections command unequal share of global economic capital.

Medical or Obstetric Determinants for CS

Although medically or obstetrically indicated cesarean section cases will not be the focus of this study, a brief review of some clinical reasons doctors or patients may select to perform or undergo CS is important in order to provide a clear distinction from the ECS, the focal point of this study. Individual maternal characteristics such as age and nutrition status (Cleary-Goldman et al., 2005), and obstetric factors (Getahun et al., 2006) resulting in to negative delivery outcomes are determinants of CS.

Doctors often perform cesarean delivery for obstetric reasons such as to prevent pelvic floor damage (Dietz, 2006), stress urinary or anal incontinence and prolapsed pelvic organ, which are associated with VD (Altman et al., 2006; Jelovsek, Maher, & Barber, 2007). Such unfavorable outcomes, however, are thought to result from how the obstetricians manage the second stage of labor (the period the newborn leaves the uterus and is pushed out from the uterus through the birth canal). For example, application of episiotomy and forceps, and vaginal delivery while lying flat on the back with feet raised (dorsal lithotomy position) with moral support from birth attendants to abridge the second stage and *Valsalva maneuver* (forceful exhalation with closed windpipe) common in developed countries, have demonstrated association with anal incontinence (Turner, Young, Solomon, Ludlow, & Benness, 2009). Even so, routine elective cesarean section does not necessarily assure protection against pelvic floor dysfunction since rates of urinary incontinence are

similar in parous and nulliparous women (Turner et al., 2006), but better management of labor at the second stage.

Findings from some studies point towards greater risks faced by women undergoing cesarean delivery including greater postpartum hemorrhage or excessive blood loss (Magann et al, 2005; Larsson, Saltvedt, Wiklund, Pahlen, & Andolf, 2006). Lost blood during cesarean delivery is on average 1,000 mL (Magann et al., 2005); double the 500 mL expected in the normal vaginal birth (Cunningham et al., 2005). In one study, Rouse et al. (2006) reported that women who undergo CS have increased (4-7 fold) risk of blood transfusion at as compared to those who undergo VD.

Other medical and obstetric decisions for cesarean section are based on the potential for fetal risks in vaginal delivery before and after, such as stillbirth at term or before the onset of labor, antepartum acquired hypoxic ischemic encephalopathy and intrapartum death (Burns, Rutherford, Boardman, & Cowan, 2008). However, these outcomes are rare, even among the high risk women and cannot be medically justified among women without any identifiable risk factors (Begg, Vella-Brincat, & Robertshawe, 2008). Most of these cesarean sections performed for medical or obstetric reasons heavily involve the advice and/or instructions of the physician; not largely so for ECS, which is predominantly at the woman's request.

In one cross-sectional study of 600 women proportionately sampled from women delivering from 10 Beirut hospitals in Lebanon (Kassak, Ali, & Abdallah, 2005), results indicated that maternal, institutional and physician characteristics all

congregate to influence the rate of cesarean sections. Maternal characteristics such as age at delivery, gestational age, education level, occupation, parity, number of antenatal visits, and health insurance (Smith et al., 2008; Wilson et al., 2010), maternity hospital characteristics (whether private or public, teaching or non-teaching, bed capacity, number of obstetricians/ birth attendants), and physician characteristics such as financial incentive, time of convenience whether day or night, and whether weekday or weekend have been reported to affect the number of CS deliveries (Kassak, Ali, & Abdallah, 2005).

<div align="center">**Psychosocial Determinants of ECS**</div>

Psychological and emotional reasons, not clinical indication, are usually the basis of women's wishes for ECS births (Thompson, 2010). Several reasons may explain a woman's preference for an elective cesarean to vaginal delivery; but these are often interrelated, making it hard for women and public health personnel to interpret and to tackle the predictive influences.

Personality Traits (Women's Autonomy, Self-Control and Self-Esteem)

One's personality is important in making decisions that help them assert and maintain control over stressful events or aspects of their environment such as birth. The desire to achieve, take risks and cope with such a stressful event is influenced by one's personality traits such as self-esteem, rationality, sense of time-consciousness/urgency, patience, anger/aggression/hostility, anxiety that defines behavior patterns. Some studies have related behavior patterns – Type A and Type B personalities to certain chronic diseases (Friedman, 2008) while others have linked

Type D personality to these diseases (Denollet, Schiffer, & Spek, 2010; Sher, 2005)

but not in delivery choice decisions. Personality traits can influence the outcome of

childbirth, and different women have different personalities including the level of

depression (Akman et al., 2007) and fear (Ryding et al., 2007) that may determine

their attitude to pregnancy and request for a particular mode (ECS or vaginal) of

delivery (Wiklund et al., 2006).

The concept of autonomy (self-control) and the woman's informed choice has

been advanced in some quarters, especially where the woman is provided with full

information of the benefits and risks of ECS (Pang et al., 2007). Of particular

concern is that most ECS demands by women have not been based on full knowledge

hence the difficulty to assess informed consent. For instance, women have often

reported insufficient knowledge of the risks associated with cesarean delivery

(Robson et al, 2008), not necessarily because they are not counseled, but because they

are either unable, or unwilling to recollect the information (Thompson, 2010). As

much as the woman's choice for a MoD should be valued, the health practitioners

have a duty of care, besides interrogating the knowledge and information that is

associated with such decision. According to Mander (2007), offering surgery without

any clinical indications that may place both the woman and the baby at greater risk

and no net benefit, would breach that duty of care. In a limited healthcare resources

context, maternity services cannot justifiably serve consumer preference at the

expense of the public at all times.

In an anonymous postal interview of 78 Australian women, the primary ECS cases reported a satisfaction rate of 92.5% with the MoD and their ability to make an autonomous decision (Robson, Carey, Mishra, & Dear, 2008). These findings are indicative of women's desire to exercise self-control and autonomy on their preference over MoD. This is true especially among those who are educated and have higher income. Such women are perceived by physicians to have higher level of access to information and are able articulate about their informed choices (Bailey, Crane, & Nugent, 2008).

In a longitudinal observational investigation on preference for ECS among Chinese women, Pang et al. (2007) interviewed primiparous women (with one previous birth) from two Hong Kong maternity units and found that 46.2% of the women interviewed who had initially scheduled their delivery in the public health facilities later booked with a private hospital. The women explained that after requesting delivery by cesarean section they changed to private hospitals where they could easily attain their preferred MoD and so maintaining their autonomy for choice of delivery (Pang et al., 2007). Out of 52 women who preferred ECS in this study, 7.7% stated their primary reason for choosing ECS was control. Several women have reiterated their desire to assert their autonomy and self-control as their right to choose MoD even with disregard to their clinician's views (Munro et al., 2009). This desire for self-control is associated with the ability to take charge of their bodies (Snowden, Martin, Jomeen, & Martin, 2011) and ability to plan the date and time of delivery due to work or family related obligations (Pang et al., 2007; Munro et al., 2009) or

preference for certain socially desirable days (Kassak, Ali, & Abdallah, 2005). The choice for ECS may also change in the course of the pregnancy, for instance in the Hong Kong Study (Pang, et al., 2007), more women (42.0%) who at mid-term preferred elective cesarean section reverted to a trial of VD at full term than their counterparts (3.8%).

Wiklund, Edman, Larsson, and Andolf (2009) studied variations in personality from last trimester to early motherhood among primiparous mothers having VD or CS among a group-comparative, prospective cohort of 314 healthy primiparas who had either maternally requested CS or spontaneous vaginal delivery. Participants from the two groups became more impetuous, guilty, and detached on a Karolinska Personality Scales (KPS), but generally maintained relative stability on their personality scores during the 37-39 weeks of gestation transition to motherhood in the 9 months follow-up after delivery (Wiklund et al., 2009). Earlier, Wiklund et al. (2006) found significant differences in personality traits such as socialization (attachment to significant adult others) and avoidance of monotony or boredom between mothers who requested a CS and those who did not.

In summary, the right of choice and autonomy for MoD should not be based merely on access or not to cesarean services but the discussion should be put in the context of the best outcome for not only the mother and forthcoming infant but also on the population's health with professional guidance about safety and quality of life. The options of appropriate delivery for a woman demands that healthcare service providers consider the woman's voice and life circumstances into the decision matrix

earlier in pregnancy (Kukla et al., 2009) and that she be given guidance to make a

well informed decision. This model is suggested rather than the traditional model of

the provider considering that because the patient is 35 years old (age), pregnant for

the first time (parity), is not anticipating any more pregnancies, and willing to pay

more, then ECS becomes a sensible alternative. Furthermore, in consistency with the

ACOG (2007) regulations, the provider should refrain from performing CS if it is

harmful to the overall welfare and health of both fetus and the mother and so the

provider needs not grant a superseding credence to the client's choices, when these go

contrary to the child's, patient's, or public's good.

Fear

Fear of labor pain and child birth also referred to as tocophobia (Wiklund et

al., 2007) is often cited by women as the primary reason for requesting cesarean

section (Buyukbayrak et al., 2010; Munro et al, 2009; Nerum, Halvorsen, Sorlie,

Tore, & Oian, 2006; Robson et al, 2008). It is unclear how with the advanced

knowledge and use of pain relievers in delivery management, the fear of labor pain

remain one of the most cited reasons for avoiding vaginal births and opting for

elective cesarean section deliveries (Tschudin et al., 2009). This feeling of inability

against labor pain points towards the lack of confidence to undergo the delivery

process and so factors relating to the woman's self esteem requires considerable

attention.

In an exploratory study, Munro, Kornelsen, and Hutton (2009) interviewed

some17 primipara from urban maternity hospitals in Canada on their beliefs and

attitudes about ECS. Findings showed that birth stories and knowledge were crucial in framing women's decisions for CDMR (p. 376).

In a different qualitative study among 19 primiparous Turkish women (seven of whom were considering an ECS) content- analysis from the interviews showed the women experienced fear of childbirth. The phobias were linked to complications of birth and associated procedures, sexuality, labor pain, and lack of confidence in birthing of health professionals (Serçekuş and Okumuş, 2007).

In a follow-up study, Pang, Leung, Lau, and Chung (2008) examined the preference for ECS of 259 participants of the Hong Kong cohort study at their first pregnancies to identify the factors that determined the women's shift of preference from a planned VD to ECS after their first childbirth. The main reason for the change of preference was fear (24.4%) of vaginal birth (Pang et al., 2008).

The fear derives from past personal traumatic experiences with vaginal or emergency surgical deliveries (Cox, 2007; Pang et al., 2008) or from negative birth stories from family members, friends or other women (Munro et al., 2009). The concern for the risks vaginal delivery pose to the mother and the infant has also been cited as a source of fear for vaginal delivery, and subsequent choice for an elective surgery (Tschudin et al., 2009). In the cross-sectional survey of 78 mothers who had recently undergone ECS, 46% explained they chose CS because they had worries on the risks a VD would expose their newborn to (Robson et al, 2008).

Pain Avoidance

Childbirth in humans is suggested to be among the most painful episodes in a woman's life cycle (Lally, Murtagh, Macphail & Thomson, 2008). The avoidance of labor pain is intricately linked to fear of labor pain (Abushaikha & Sheil, 2006; Aleghagen et al., 2005) as are many other psychosocial factors including previous bad birth experiences (Nilsson & Lundgren, 2009), interaction with healthcare provider and self-efficacy or confidence (Hauck, Fenwick, Downie, & Butt, 2007). Wiech and Tracey (2009) explained that fear aggravates the sensitivity to pain a woman experiences during labor and delivery, and so this elevated perception of pain adds to the fear, thereby exacerbating the pain experienced. Abushaikha and Sheil (2006) underscore this point when defining labor stress in terms of the degree of psychological stress, reflecting a complex of pain and fear the women experiences in labor. Labor is a painful event in life, typified by stressful psychological and physiological changes that challenge a woman's coping ability and call for fast behavioral adjustments (Ip, Tang, & Goggins, 2009).

Tschudin, Alder, Hendriksen, Bitzer, Popp, Zanetti et al.(2009) in 3-month study conducted at two health centers in Germany, anonymously administered a structured questionnaire on 201 expectant women to compare rural versus urban, nullipara versus parous women and those opting for vaginal versus CS, as regards the awareness and attitudes towards CSMD. The study found a high (92%) awareness of the likelihood of delivering by CSMD with mass media (print, television) and friends being the most listed sources of motivational information. Missing the birth

experience and pain avoidance was cited as the main reasons against and for CSMD, respectively. Among those who opted for CSMD, negative or traumatic birth experience emerged as the decisive factor for participants' attitude towards CSMD (Tschudin et al., 2009). Some researchers suggest that these perceptions of CS are partly misconceptions based on lack of knowledge (Weaver, Statham, & Richards, 2007).

In a recent study among 1,588 Turkish women visiting a metropolitan antenatal clinic (Buyukbayrak et al., 2010), 15.9% of women interviewed chose cesarean delivery and provided fear of vaginal delivery (45.2%), and avoidance of labor pain (19.0%) as two most common reasons. The study also found that monthly income, age, and parity to influence maternal preference, but gestational age, educational status, and occupation did not predict the MoD (Buyukbayrak et al., 2010).

Emotional Health (Pregnancy Depression, Anxiety and Stress)

Labor related stress has been suggested to contribute not only to decreased confidence but also to negative interpretations of the pregnancy experience, concerns regarding children, parenting capacities, and depression (Ip & Martin, 2008).

Women who enter into childbirth with much anxiety or unrealistic expectations that may exceed the experienced outcome are likely to report less satisfaction with their birthing process (Lally, Murtagh, Macphail, & Thomson, 2008). Depression reduces the woman's confidence to deal with the stressful birthing

and conversely the confidence level exhibited by a woman as she entered labor will predict the woman's level of depression postpartum (Ip & Martin, 2008).

The relationship between stress levels, fear and perception of pain during labor and childbirth and its outcome has been supported by physiological mechanism when Gunning (2008) found that rise in blood levels of stress hormones in the mother reduces the blood supply available to the fetus and is toxic to both the mother and the baby, especially if the stress during childbirth is severe. Encountering a frightened situation causes the body to produce stress hormones that may affect labor progression, including longer labors (Aleghagen, Wijma, Lundberg, & Wijma, 2005), which may induce the woman to opt for planned elective cesarean section.

Preservation of Sexual Function

Experiencing deterioration of sexual functioning after a surgical intervention is a studied psychosexual problem and postpartum sexual health is considered a driving factor in the rising CS rates due to the perception that cesarean delivery preserves vaginal integrity. Alicikus et al. (2009) assessed the body image and psychosexual features of quality of life of 112 breast cancer patients in Turkey and reported that 41% of the sexually active women felt decline in sexual functioning after surgical management due to loss of interest in partner, loss of libido, and sexual dissatisfaction. These conditions are more probable among those with pre-existing problems of sexual dysfunction, anxiety, or depression (Pauls, 2010). Paradoxically, some women have considered ECS as a means to preserve their sexual function, even though the association between sexual problems and MoD are yet to be substantiated.

Many studies have documented that primipara reported reduced sexual sensations and satisfaction within the 6 months after VD (Brubaker et al., 2008). Furthermore, women who suffer perineal injury (Radestad, Olsson, Nissen, & Rubertsson, 2008), had episiotomy-assisted childbirth or have a history of dyspareunia (Ejegard, Ryding, & Sjogren, 2008) are more likely to delay resuming sexual intercourse after childbirth. However, in another study those who delivered by CS were on average likely to resume intercourse sooner than those who had vaginal delivery with an episiotomy (Lurie et al., 2013). Baksu et al. (2007) discussed several factors related to the postnatal sexual dysfunction which include aspects such as pain during intercourse and difficulties in lubrication, arousal, and orgasm, which are suppressed postpartum by surgical incisions in vaginal delivery.

There are mixed findings and the reasons given in these studies may merely be perceptions related to culture as some observational studies have failed to find significant variations in sexual function between women who gave birth through a vaginal delivery without deep perineal laceration, episiotomy, or secondary surgical interventions and those who delivered through ECS (Klein et al., 2009). Khajehei, Ziyadlou, Safari Rad, Tabatabaee, and Kashefi (2009) in a cross sectional study among 50 primiparous Iranian mothers who had delivered 6-12 months before and visited for postnatal health care in a hospital, found clinical but no statistical differences in the sexual outcomes between women who spontaneously delivered with mediolateral episiotomy and those who had ECS. The spontaneous vaginal delivery (SVD) group frequently cited decreased libido, vaginal looseness and sexual

dissatisfaction, and the ECS group cited vaginal dryness, sexual dissatisfaction, and decreased libido in that order as the most common postnatal sexual problems (Khajehei et al., 2008). Pahel (2005) reported these postnatal sexual problems but the associations between the problems and MoD were not statistically significant.

Hantoushzadeh et al. (2008) conducted a cohort study among 618 primiparous women of which 303 had vaginally delivered and 315 had undergone ECS in seven private hospitals in Tehran. The study sought to assess the women's postnatal sexual health and whether women who had ECS experienced greater postnatal sexual health than those who had vaginal births. After several follow-ups lasting up to 12 months post-delivery, more sexual satisfaction was reported in the VD group than in the CS group but no association was reported between MoD and pelvic pain (Hantoushzadeh et al., 2008) challenging the logic of requesting for cesarean section for reasons of maintaining sexual satisfaction after childbirth.

In a clear departure from many other surveys, Gungor et al. (2007) studied the relationship between sexual problems and the MoD among a cohort of 107 men who accompanied their wives to outpatient maternal health clinics. Although the proportion of male sexual dysfunction was higher (28.6%) in those whose partners had elective cesarean than in those whose partners had vaginal delivery (19.4%), generally men's sexual function was not affected by their spouse's MoD and parity, and so requesting ECS merely because of problems regarding sexual functionality provides no extra benefit even to their male partners.

Familial Support and Social Networks

Several studies (Hodnett, Gates, Hofmeyr, Sakala, & Weston, 2012; Kohler, Behrman, & Watkins, 2007; Deng et al., 2014) have indicated that women who receive family social support and nursing support in pregnancy and during labor have lower rates of surgical vaginal deliveries, cesarean sections, use of analgesia and shorter labors compared to those who did not receive support regardless of type.

Hodnett, Gates, Hofmeyr, and Sakala (2007) in a review of 16 studies found that pregnant women who received continuous social support were also more probable to have shorter labor, spontaneous VD, and satisfaction with childbirth experiences. Continuous intrapartum support provided superior benefits when the source of social support was not the maternity personnel, and when it was initiated early in labor. Hodnett et al. (2012) reported that emotional support and nursing behaviors such as praises, confident and calm appearance, treating the woman with care, respect and assistance in relaxing and breathing were the most helpful to women during labor.

In a number of countries, it is a routine practice to have the partner/father and other support persons present in company of the laboring women (Hodnett et al., 2012). However, in some parts, this is not the case, particularly in Kenya, where promoting nursing support becomes vital (Mullick, Kunene, & Wanjiru, 2005; Iliyasu, Abubakar, Galadanci, & Aliyu, 2010). The analysis of data from six countries: Bangladesh, Colombia, Dominican Republic, Egypt, Morocco, and Vietnam to assess the individual, institutional, and societal factors that affect CS in

over 20,000 births, suggest that sharing information on reproductive health among familial and social networks may reduce women's decision to undergo CS (Leone, Padmadas, &, Matthews, 2008).

Several studies have demonstrated that women with social network connections gain greater self-esteem and are more likely than those without connections to have a wide discussion of issues related to reproductive health and to make informed choices and decisions (WHO, 2005) including receiving counseling and discussing sensitive reproductive health matters with health providers and peers. Most studies have related strong social networks to fertility, use of contraceptives, family planning, and knowledge and behavior related to HIV/AIDS (Kohler, Behrman, & Watkins, 2007), but few research have focused directly on the effects of social networks on the cesarean section decisions. Women who undergo medically indicated cesarean delivery tend to be married and older (Lin & Xirasagar, 2005) than those who choose vaginal birth. Furthermore, strong social network is directly linked to emotional and physical support that will equip women to experience healthier pregnancy and birth outcomes (Leone, Padmadas, & Matthews, 2008).

Social Convenience

A woman's convenience and personal preference for CS is associated with the MoD in subsequent births, even though not all women who confess preference for ECS early in pregnancy eventually undergo the surgical delivery (Bettes et al., 2007; Tillet, 2005; Weaver, Statham, & Richards, 2007). In a cohort study that used interview data from 2878 Swedish-speaking women early in pregnancy and two

months postpartum, as well as the Swedish medical birth register's postnatal data, only 30.5% of 236 participants who desired to deliver by cesarean section early in pregnancy did so; eight percent subsequently had ECS, 14.8% had an emergency cesarean section and the rest underwent vaginal delivery (Hildingsson, 2008).

Timing of delivery of a cesarean section without any complicating factor can be planned for a convenient period, often after the 37th week since babies of 37–41 weeks of gestation are regarded full-term and mature. Time of convenience whether day or night, and whether weekday or weekend influence the number of CS (Kassak, Ali, & Abdallah, 2005). Kassak, Ali and Abdallah (2005) reported significantly lower rates of cesarean section on night shifts and weekends in Beirut, Lebanon to accommodate the schedules of the doctor and the client.

Gezer, Sximsek, and Altinok (2007) in exploring the evolutionary trends of cesarean section deliveries in Turkey, explains the preference for day time CS operations as *daylight obstetrics*, which involve organizing work hours so to fit with scheduled operations, not out of any evidence-based research for positive outcome but at convenience of the health provider and patient. According to ACOG (2007), scheduling elective cesarean delivery to accommodate physician and/or patient convenience, increases the risk that it is done earlier than is appropriate (<39 weeks or before labor onset) resulting in increased risk of adverse neonatal outcomes.

Review of Methodology

Review of Past Study Designs

Few quantitative studies have attempted to measure rates of CS without clinical indication but even these were conducted in different settings, used different approaches, or definitions making comparisons difficult. Lin and Xirasagar (2005) used retrospective routine obstetric records of 904,657 cesarean births from the National Health Insurance database for the period 1997-2001 and reported ECS rates of $2 - 3.5\%$ that increased with maternal age. In such studies using routine records (Lin and Xirasagar, 2005) the obstetrician often does not give the reason for the ECS and it is not specified if these women did or did not have clinical indications, making it difficult to identify cases where cesarean delivery was made as the woman's request.

Pang et al. (2007) studied changes in women's preference for ECS as gestation advances among in a prospective cohort in two (one private and the other public) obstetric care units in Hong Kong. In this observational study, participants took two interviews at gestational weeks 18–22 and 35–37 respectively using a structured questionnaire. Participants were requested to select from a preset list their MoD preference and associated reasons. The women were also asked to take self-report evaluation of psychometric scales: Trust in Physician scales (TPS), Multidimensional Health Locus of Control Scales (MHLC), and the State-trait Anxiety Inventory (STAI). The proportion of those who preferred ECS declined

from 17.2% p at mid-trimester to 12.7% at full-term with partner preference and support playing a significant role in the ultimate MoD (Pang et al, 2007).

In a mail survey that investigated future preference for ECS in primigravida women involved in a previous Hong Kong longitudinal cohort study (Pang et al., 2008), 259 women in 6 months postpartum period completed four self-administered psychometric scales: the EPDS, MHLC, STAI, and Trust in Physician Scale (TPS). The study found positive association between higher trait anxiety score, actual delivery by elective CS, actual delivery by emergency CS, higher family income, intrauterine growth restriction, and use of epidural analgesia with change in MoD. Tocophobia was reported as the principal reason for women who changed their preference from VD to ECS (Pang et al., 2008).

Review of Past Study Instruments

Personality trait measurement tools. Combinations of psychosocial scales of relevance have been used to study determinants of ECS. For instance, three of the most commonly used tools for measuring personality traits include the ACS-30, CBSEI-C32, and RSE.

ACS-30 tool is a 30-item short form of the 50-item Autonomy Scale (Bekker & van Assen, 2006). It reliably and validly measures autonomy of oneself in relation to other persons (Bekker & van Assen, 2006) in a 5-point Likert scale scored on the degree of agreement from 1 (*disagree*) to 5 (*agree*) at four levels, that is, self-awareness, capacity for managing new situations, sensitivity to others, and occupational self-efficacy. The Self-Awareness Subscale assesses awareness

capability and expression of personal views in a social environment. The Sensitivity to Others subscale assesses level of sensitivity to other people's views and needs. The third subscale Capacity for Managing New Situations measures the ability to adapt to new or unique circumstances (Bekker & van Assen, 2006).

The 32-item short form of CBSEI is used to evaluate perceived self-efficacy to coping with stressful life events in a general sense (Ip, Chung, &Tang, 2008). It is the short form of Lowe's 62-item CBSEI (Lowe, 2007). It is a self-administered tool that assesses the woman's perceived capacity to perform specific coping behaviors in labor, and her perceived confidence and self-efficacy in her capability to cope with the impending labor (Ip, 2007). It is made up of two parts: part 1 -The outcome expectancy (OE-16) for childbirth assesses the perceived ability to carry out definite behaviors to cope during labor using ten point Likert scale of helpfulness of a behavior (0 = not helpful at all, 10 = very helpful) whereas part 2 – The efficacy expectancy (EE-16) assesses on a Likert scale from 1 to 10 the belief (how sure) that improved childbirth experience will result from performing the distinct behavior (Ip, Chan, & Chien, 2005). The CBSEI is reliable and adequately consistent with Bandura's Self-Efficacy Theory which predicts that parity or having prior positive birth experience has the biggest effect on childbirth self-efficacy, followed in order by knowledge about childbirth, social support and anxiety (Cunqueiro, Comeche, & Docampo, 2009).

There are many other measurements for self-esteem such as Coopersmith scale, the Piers-Harris Scale, and the Tennessee Scale with good evidence of reliability and validity reporting inter-correlations of 0.6 to 0.7 but the RSE remain the standard and most extensively used scale for global self-esteem (Schmitt, & Allik, 2005) because of its briefness (only 10 items), and its simple format which is easy to administer, score and understand. The RSE (Rosenberg, 1965) is a 10- item Guttman scale (also used as Likert scale) and has its items completed on a four point scale- from 0 to 3 (reflecting the degree of disagreement with the statement). Positively worded items are reversed before a self-esteem score is computed such that a higher score is indicative of greater self-esteem. It was first used to evaluate adolescents' global feelings of self-acceptance or self-worth, and is the benchmark against which other self-esteem measures are compared. Though RSE is a reliable and valid measure of global self-esteem - the degree to which one approves of, values, appreciates, likes, or prizes oneself, its structure is dependent on age and other sample characteristics such as occupation (Roth, Decker, Herzberg, & Brähler, 2008).

The greatest limitation of RSE and other self-esteem measures is their susceptibility to social desirability bias (favorable responses) and it is hard to obtain non-self-report measures of such a subjective personal construct (Bagley, Bolitho, & Bertrand, 2007; Mullen, Gothe, & McAuley, 2013). The scores therefore tend to overestimate self-esteem, and are skewed such that even the lowest scorers scoring above the actual mean. Nonetheless, a person who fails to score even moderately in self-esteem scale items is possibly depressed clinically and so the restricted ranges of

self-esteem scores are still instrumental among individuals who are not depressed (Bagley, Bolitho, & Bertrand, 2007).

Tools for measuring perceived labor pain. Various scales have been used in pain measurement and fall into three groupings: physiologic response, behavioral measures, and self-report (Williamson, & Hoggart, 2005). Self-reports that comprise of unidimensional scales such as numerical rating scale (NRS), visual analog scale (VAS) and verbal rating scale (VRS), and of the multi-dimensional scales such as brief pain inventory (BPI) and SF-MPQ are popular in clinical research because of their validity in assessing individual pain experience (Williamson, & Hoggart, 2005). Unlike multidimensional SF-MPQ, the VAS and NRS though easy, simple and requiring little assessment time, they cannot adequately assess the affective (emotional) component of pain (Hawker, Mian, Kendzerska, & French, 2011). Thus SF-MPQ is more reliable in measuring chronic pain involving affective components (Bouhassira, & Attal, 2009), an aspect of pain that the International Association for the Study of Pain (IASP) recommends should also be recognized, since pain is affected not only by environmental science but also by expectancies, cultural conditioning, psycho-social contingencies. Behavioral assessment includes amount of pain killer used and facial expression during pain. However, the biological response to pain including pulse rate reaction is not associated with pain response (Kalisch, Wiech, Critchley, & Dolan, 2006). The SF-MPQ can assess perceived pain pre-birth and experienced pain post-partum (Grafton, Foster, & Wright, 2005).

Tools for measuring fear of child birth (FoB). FoB can be assessed in many ways but the W-DEQ is one of the most commonly used tools. Other tools in use are the VAS as previously used in a Finnish research (Rouhe, Salmela-Aro, Halmesmäki, & Saisto, 2009), the Delivery Fear Scale (Wijma, Alehagen, & Wijma, 2002) or the FoB scale used in a comparative cross-cultural study (Haines, Pallant, Karlström, & Hildingsson, 2010). The 33-item W-DEQ (Wijma, Alehagen, & Wijma, 2002) is Likert-type scale that reliably assesses thoughts and feelings regarding childbirth with scores ranging from 1 to 6. After completing the W-DEQ, participants can be requested to indicate how afraid (from 0 to 10) they are of childbirth on the VAS. They can also be asked which MoD they would prefer/preferred and for information concerning their immediate past deliveries (Rouhe et al., 2009).

Tools for measuring preservation of sexual function. The FSFI and BISCS have been used as valid and reliable measures in sexual function studies (Morrison, Doss, & Perez, 2009; Verit, F. & Verit, A., 2007). The FSFI is a 19-item index divided into six subscales or domains that consist of pain, desire, lubrication, sexual arousal, orgasm, and satisfaction rated on a score of 1 to 6, with a score of one reflecting the lowest and a score of six reflecting the highest level of female sexual function.

Researchers who have studied the association between body image and sex have identified a need for a body image dimension specific to sexual function. Weaver and Byers (2006) suggest that body image concerns stand out in situations

where the body is the central focus of the event. The body image self-consciousness was conceived by Wiederman to account for the otherwise missing dimension specific to sex, and developed a measure to assess this construct – the BISCS (McDonagh, Morrison, & McGuire, 2008). Grogan (2006) concurs that body image is comprised of three dimensions - perceptual/evaluative body image, affective body image and behavioral body image. Perceptual or evaluative image concerns an individual's evaluation or appraisal of their body. Feelings and emotions about one's body are classified as affective body image. The BISC can be classified as a sub-component of behavioral body image due to its assessment of sexual behaviors dictated by body image, that is, the degree to which one's sexual behaviors are affected by their thoughts and feelings about their body. The BISCS is a 15-item psychometric measure of a woman's sexual desirability (Wiederman, 2000). Irrespective of the actual size of the body and other general indicators of body image or well -being, the BISCS score predict the presence or lack of a woman's sexual activity, sexual esteem, and sexual assertiveness.

Tools for measuring emotional health status. The 10-item EPDS assesses the feeling of depression by a pregnant woman as well as a woman who delivered recently with good reliability and validity (Gibson et al., 2009). It has concurrent validity with other perinatal depression rapid assessment tools such as the Beck Depression Inventory (BDI), Center for Epidemiologic Studies Depression Scale (CES-D), Postpartum Depression Screening Scale (PDSS), and with the Short Form Health Survey (SF-36) [Boyd, Le, & Somberg, 2005]. Overall, the EPDS having the

least number of items, remains the most common clinical screening tool in research

based on ≥13 score to designate major depression, compared to BDI (21-items), BDI-

II (21 items), PDSS (35 items) and CES-D (20 items).

Two other tools widely used for measuring emotional health are the STAI -

used to measure both current and chronic anxiety of a person (Kvaal, Ulstein,

Nordhus, & Engedal, 2005) with more than 30 translations in cross-cultural research

and clinical settings, and Affect Intensity Measure (AIM) with a 40 Likert-type items

used to assess pregnancy- related stress levels among participants (Littleton, Bye,

Buck, & Amacker, 2010).

There are three forms of the STAI: the first version STAI form X (STAI –X),

the STAI for children, and the STAI form Y (STAI –Y), which can differentiate

between emotional or temporary or state anxiety versus trait or long- standing

personality anxiety in adults. STAI - Y also measures the severity of the overall

anxiety level besides the two types of anxiety (Alderdice, Lynn, & Lobel, 2012).

The AIM measures the intensity (strength or weakness) with which a person

characteristically experiences positive and negative emotions. Affect intensity is

described as a stable personality trait, reflecting the typical intensity with which one

experiences different emotions - pleasant or unpleasant (Lucas, Diener, & Larsen,

2009). AIM has been criticized to assume unidimensionality or to tap only one

dimensions of intensity despite presenting it as multidimensional scale that consist of

five or more factors - Negative Affect Intensity, Positive Affect Intensity, Preference

for Arousal, Visceral Reactivity to Emotional Events, and General Emotional

Intensity (Littleton, Bye, Buck, & Amacker, 2010).

Besides AIM, five other common measures of affect intensity are: First, the

Emotional Intensity Scale (EIS) - a 30 item scale each asking the participant how they

will respond imagining being in a specific emotionally evocative situation

(Bachorowsky & Braaten, 1994; Pandey, & Saxena, 2012). It exhibits a .45

correlation with AIM and a characteristic correlation with third variable very similar

to AIM, but the validity of EIS is not fully established. Second, the Berkeley

Expressivity Questionnaire that assesses impulse strength or the strength of emotional

experiencing using six items measured on a scale of 1 to 7 (Zijlstra, Taal, Van de

Laar, & Rasker, 2007). Third, the Affect Intensity Questionnaire (AIQ) – an 18-item

visual analogue scale on which participants rate their relative intensities of specific

affects they experience (Verduyn, Van Mechelen, Tuerlinckx, Meers, & Van Coillie,

2009). It is suitable for measuring state rather that trait affect, and its psychometric

properties are influenced by the instructions use to rate the emotions in relation to

each other. Fourth, the Intensity and Time Affect Survey (ITAS) - adjective rating of

24 emotion terms on which participants rate the intensity with which they experience

a particular emotion (Schimmack, 2007). Fifth, the Scenario Rating Task (SRT) –

consisting of 20 standardized scenarios presented to participants are asked to imagine

they were in and to rate how they would respond each on a scale of 10 emotions.

Besides the long and repetitive ratings (up to 200) of the instrument, it is based on

hypothetical responses to imagined situations (Schimmack, 2007). It has validity

correlations comparable to AIM, which is a much shorter and more economical instrument. The ITAS has even lower validity coefficients than both SRT and AIM (Schimmack, 2007).

AIM thus remains the principal measure of affect intensity with wide use in research and with translation into several languages including Spanish, German, Italian, Portuguese, Croatian and Swedish; and has been shortened and with lowered reading levels (Schimmack, 2007). AIM distinguishes between frequency and intensity of emotional experience (Solhan, Trull, Jahng, & Wood, 2009).

Tools for measuring perceived social support. Perceived social support concerns the subjective perceptions of the degree of availability of members of a social network to provide social support representing the cognitive aspect of social support (Friedlander, Reid, Shupak, & Cribbie, 2007). Several instruments have been used in measuring perceived social support in previous studies with varied length and reliability scores. These include the Norbeck Social Support Questionnaire with 10 subscales (Gigliotti, E. (2006), Perceived Social Support- Short with family and friends subscales (Sheets Jr, & Mohr, 2009), Scales of Perceived Social Support with 15 subscales (Haber, Cohen, Lucas, & Baltes, 2007), Perceived Support Network Inventory with six subscales (De Paula Lima, Norman, & De Paula Lima, 2005), Social Provisions Scale with six subscales (Vogel, Wester, Wei & Boysen, 2005), Significant Others Scale with four subscales (Steptoe, Lindsay, Forrest, & Power, 2006), the MSPSS with only three subscales (Zimet, Dahlem, Zimet & Farley, 1988;

Bruwer, Emsley, Kidd, Lochner, & Seedat, 2008) and the Sarason's Social Support

Questionnaire (Gottlieb, & Bergen, 2010).

Initially developed in the US on university students as a self-appraisal of

social support, Zimet et al. (1988) demonstrated that the 12-item MSPSS instrument

measures three types of social support – family, friends and significant others on 1 to

7 point Likert scale with good reliability. The tool also suffers little social

desirability bias even though all its items are positively worded (Gottlieb, & Bergen,

2010). It is short, suitable for a study that involves assessment of multiple variables,

and is easy to understand (Haber, Cohen, Lucas, & Baltes, 2007). Girls generally

report higher score on the friends support and fewer scores on the family support than

boys (Rockhill, Stoep, McCauley, & Katon, 2009).

Summary and Transition

In this chapter, a review of the studies in literature about psychosocial factors

influencing ECS is outlined focusing on the key findings, methodological strengths

and limitations and research gaps. In conclusion, there is still no scientific evidence

in terms of randomized controlled trials (RCTs) on whether or not cesarean delivery

is better than vaginal birth, the consequences to child and mother, and the basis on

which to suggest ECS - in absence of medical indications. Studies on CS have

hitherto concentrated more on physician, hospital or maternal characteristics, trial of

labor after first CS and other obstetric outcomes. These studies have also focused on

planned CS, which are medically or obstetrically indicated for many reasons, such as,

history of previous CS, abnormal presentations, placenta previa, multiple

pregnancies, known medical conditions and obstructions of labor. Few studies

however, focus on the actual determinants of ECS, especially psychosocial

determinants. Even little of the research has been quantitative with a design able to

determine the nature and strength of correlations between such factors that affects a

woman's preference for ECS. Only a few studies, mostly in the west and Asian

countries, have methodically investigated the factors contributing to the latest rises in

cesarean rates, much less using logistic regression analyses to predict the various

psychosocial factors that influence decisions for elective cesarean sections. This

study was therefore an attempt to fill these gaps in the dearth of knowledge on the

understanding of the epidemiology of ECS in Nairobi including ECS rates, and to

identify the psychosocial determinants of ECS and the relative contribution of each

identified factor in a predictive model.

In the next chapter, the methods to be used in achieving the research

objectives in terms of design, sample and instruments are outlined. The analysis of

each research question/variable and strategies for the protection of human subjects are

also presented in chapter 3.

Chapter 3: Research Method

The review of literature in Chapter 2 identified the need for a quantitative study that puts together all the psychosocial factors that individual studies have separately identified to influence women's consideration for elective cesarean section (ECS). This study aims to investigate the psychosocial determinants of ECS in selected hospitals in Nairobi.

This chapter describes the method used in this research study. The chapter includes an account of the various sub topics of the methodology including description of design of the study, sampling procedure, research tools, analysis procedures, and how ethical concerns were addressed. A synopsis of the study's design and approach includes the justification for preferring the study design. The details of sample characteristics, size and recruitment process are presented. The different study tools including questionnaires and specific psychometric scales used in the measurement of the various hypothesized independent variables are discussed and the rationale for their selection presented. The data collection process and analysis including statistical tests performed are also discussed. Strategies for protection of the human subjects are also discussed under ethical considerations.

Research Design and Rationale

This research is a quantitative methods approach, which is related to post-positivist worldview and the theory-then-research approach whereby the theoretical basis is outlined, hypotheses are identified for practical testing, and the study is designed to examine the significance of given relationships. The study characterizes

the study population (urban pregnant women) by interviewing a sample of prenatal clients in two national maternity hospitals, in order to make claims about assessed characteristics of this population.

A prospective cohort design was employed in a systematic sample of third trimester pregnant women seeking prenatal services in two Nairobi hospitals who were registered over a cumulative period of three months. A prospective design was selected because it allows an appropriate temporal sequence between multiple exposure factors and outcome hence predict the actual MoD the woman performs from the participant's psychosocial status; this is especially important since the woman's preference and intentions for a particular MoD may change during the pregnancy process and differ from the actual MoD used (Pang, et al., 2007). It is also appropriate for public health research in instances when random assignment of participants to study groups is unethical, impractical or impossible (McKenzie, Neiger, & Thackeray, 2009, p. 364). Random assignment of study participants to a particular group for different modes of delivery could not be possible; instead scores on a set of psychometric scales that reflect the perceived level of psychosocial status were investigated in relation to their MoD intentions and outcomes. The design is apposite in testing specific hypotheses on individual or independent significant predictive relationships for psychosocial factors and MoD.

Study Setting and Sample

Setting

The study was performed among women attending prenatal services in two government hospitals (Pumwani Maternity Hospital and Kenyatta National Hospital) in Nairobi. Nairobi is the capital city of Kenya, with the fastest growing urban population of 3.1 million (1.6 million male; 1.5 million female) out of the national census of 38.6 million (Central Bureau of Statistics, 2009). The rates of CS are usually higher in the urban centers compared to rates in the rural areas (Betran et al., 2007; KDHS, 2010) and much higher in the private hospitals compared to public hospitals (Villar et al., 2006; Wanyonyi, Sequeira, & Obura, 2006). The capital city, Nairobi, is cosmopolitan and holds nearly all of the forty two different ethnic groups of the country, with the five largest communities: Kikuyu (22%), Luhya (14%), Luo (13%), Kalenjin (12%) and Kamba (11%), which compose at least 70% of the country's population reflected in the various settlements in the city (CBS, 2009). The city also hosts some of the largest slum dwellings in Africa with Kibera, Mathare, Mukuru and Soweto slums constituting more than half of the city's population (CBS, 2009).

The Kenyan health provision sector is comprised of both formal and informal sector. The formal sector consists of private and public health facilities regulated by the ministries of medical services and public health, whereas the informal sector is made up of traditional healers over which the Ministry of Health (MoH) has no control. Kenyatta National Hospital and Pumwani Maternity Hospital are two major

maternity centers situated in Nairobi. Many private nursing homes and hospitals in Nairobi also offer obstetric services; the private wing of KNH exemplifies such a facility.

KNH is one of the two teaching and referral hospitals. It offers a variety of maternal healthcare services and complex curative tertiary care that requires high-technological equipment and highly skilled personnel. It also enforces quality standards, conduct health research and provide both basic and post-graduate training for health professionals. More than 8,000 children are born at KNH every year (KNH, 2010). It has a bed capacity of 2000, of which 130 are for maternity care. The catchment population is drawn from Nairobi and its environs including: Kiambu, Thika, Machakos and Kajiado counties. Clientele in the private wing is composed of persons of different racial, cultural and religious affiliations, mainly of the middle income group (Wanyonyi, Sequeira, & Obura, 2006).

PMH is situated in the east side of Nairobi and is neighbored by the relatively poor-income settlements such as Mathare, Eastleigh, Muthurwa, and Majengo. PMH is the oldest and largest maternity hospital in Nairobi County and is the first environment experienced by hundreds of thousands of babies in the country. The hospital provides ante-natal and postnatal services, maternity admissions, and specialist nursery for premature babies in addition to prevention services on Mother to Child Transmission of HIV. About 70 deliveries are carried-out daily of which 10 are cesarean sections and up to 35, 000 children are born in Pumwani per year (PMH,

2010) with care provided by about 10 midwives. The hospital's vital follow-up care includes supplementary nutrition, immunization, counseling and referrals.

Study Participants

Women of reproductive age (18-49 years) in their third trimester (≥28 weeks) who are attending prenatal services in three purposively selected maternity facilities in Nairobi constituted the study participants. The maternity centers attract clients from different settlements representing different socio-economic profiles: Pumwani serves most of the poor and low socio-economic clients, while the public wing of KNH serves both low and middle socioeconomic groups. The private wing of KNH, however serves mostly the middle and more affluent socioeconomic groups. The selection of clients from the two maternity facilities thus provides adequate context for investigating the social profile and secular patterns related to elective cesarean section practice.

Inclusion and Exclusion Criteria

The participants of the study included women:

- in the third trimester (28-36 weeks) of pregnancy (only within 3 months to delivery, a short enough period in order to minimize losses to follow-up but allow recruitment of sufficient sample for the study);

- in the 18-49 years age bracket (targeting the women of reproductive age and excluding the minors who are below 18 years for ethical reasons);

- Registered to deliver in any of the two maternity facilities – Pumwani or KNH (public or private wing). The two hospitals are among the biggest maternity

centers in Kenya and provide services to pregnant women population across different cultures, races and socio-economic strata.

- With ability to read, write and understand English (At least Grade 7 of education). However, the questionnaires were translated, published and administered in Kiswahili (the national language) for participants who did not understand English.

However, the following clients were excluded from the study:

- Inappropriate age bracket:

    o Women who are pregnant but are underage (<18 years). The government of Kenya considers persons less than 18 years as minors, and incapable of making legal decisions on their own.

    o Women who are more than 49 years of age (Old age is associated with not only reduced fertility but also with pregnancy and childbirth complications).

- Undesirable birth outcomes known for obstetric indications for CS:

    o Women with history of previous CS

    o Women with history of previous surgical vaginal delivery

- Medical factors for CS indication:

    o Women with multiple births or other known clinical complications

    o Women with other obstetric indications such as breech presentation, distress, dystocia (difficult childbirth or labor), or congenital abnormalities.

    o Women with known mental problem, psychiatric illness, or medical condition (such as diabetes, obesity, hypertension, coronary heart disease and HIV/AIDS).

Sampling Procedures

The study applied a systematic random and probability proportional to size (PPS) sampling strategy to select expectant women in their third trimester in two public hospitals that offer maternity services (Pumwani Maternity Hospital and Kenyatta National Hospital) as recruitment points. Using a list of antenatal clients registered in the two hospitals within a three-month period, 1359 eligible clients were proportionately selected in the two hospitals based on the size of their antenatal admission rates. Pumwani and KNH record monthly births of about 2000 and 600, respectively. Participants joined the study at the point of their third trimester prenatal appointment (1-3 months to delivery) and exit the study on their first post natal appointment, usually the sixth week post-partum when the infant is due for the first set of immunization jabs in Kenya.

The random selection of the eligible participants and the probabilistic nature of PPS sampling were to make the sample more representative of the study population, and to generate more generalizable results than convenience samples. Probability proportional to size (PPS), which makes use of available information on the health facilities to segregate it into socio-economic groups helped in ensuring that the two hospitals, types of services (private and public) and the two different groups (ECS and VB) of the population studied are evenly represented in the overall sample to improve precision for the estimates of the assessed factors (Frankfort-Nachmias & Nachmias, 2008, p. 171).

Sample Size Determination

The study is mainly designed to test no association hypothesis for each independent factor and for an overall predictive model using a logistic regression against a binary outcome variable as MoD (ECS and VB). Assuming a modest correlation (medium effect, R squared = .13 to .26) and total number of ten independent factors - seven predictors (Women's personality, Fear, Pain Avoidance, Preservation of sexual function, emotional health – anxiety, stress or depression, perceived social support, and Convenience) and at least three risk factors (maternal age, maternal education/income and occupation), and using the guidance from Tabachnick and Fidell (2001, p. 117) the following formula was used to compute sample size, assuming the estimated Nairobi ECS rate of 5.0%:

$$N = \frac{8}{f^2} + (m-1), \qquad f^2 = \frac{R^2}{1-R^2}$$

Where,

N= Sample Size

R^2 (R squared) = Square of Pearson's Correlation Coefficient (at least .13)

m = number of predictor variables =10

$N = 53.5 + (10-1) \approx 63$

And the ECS sample size after attrition (non-response) is:

$$N_T = \frac{N}{1-NRR} \qquad = N_T = \frac{63}{1-0.1} \qquad = \frac{63}{0.9} = 70$$

Where,

N = Initial sample Size

N_T =Total sample size

NRR = Non response rate = 10%   = 0.1

Therefore, providing for a liberal 10% non-response (including withdrawals and censored cases), a minimum of 70 participants were expected to have ECS.

$$N_F = \frac{N_T}{ECSRate} X100\% = \frac{70}{5\%} X100\% = 1400$$

Where,

N_F =Final sample size

Assuming a modest ECS rate of 5.0% in Nairobi, therefore a total of 1400 legible prenatal clients were be required to be selected and recruited during their succeeding appointment dates as a cohort and followed in the three maternity facilities in Nairobi for their actual MoD.

Data Collection

Expectant women attending prenatal services and were booked to deliver in the two Nairobi hospitals were with the permission of the hospitals approached for consent to participate in the study. Clients were asked to fill out a brief screening form (Appendix F) to ascertain their eligibility based on age, gestation period, previous birth experience, medical history, any obstetric indications. The participants were interviewed pre-partum using a structured questionnaire that is composed mainly of ten psychosocial scales: ACS-30, RSE, SF-MPQ, W-DEQ, CBSEI-C32, FSFI, MSPSS, EPDS, STAI and AIM and followed for their actual MoD from

hospital records or postnatal telephone interview. In addition, the convenience part of

the TSQM v. II was used to assess social convenience as a determinant of CS delivery

choice. The interviews were conducted face-to-face by female research assistants

who were nursing/health students with the necessary topic knowledge, and adequately

trained on interview techniques and administration of psychometric scales.

A pretest was conducted a week before data collection among a group of 49

pregnant women who were in their earlier trimesters (trimesters I and II) in these

facilities and were not part of the study to pilot the Kiswahili translated

questionnaires (translated back and forth by language expert) and the procedures for

data collection in order to identify, review and clarify any unclear issues or errors

prior to the data collection proper. No cultural or idiomatic differences were noted

between English and Kiswahili administrations of the tool and few only two out of

the 49 chose to respond to the Kiswahili version. Only minor typographical errors

were corrected on the tool used in the final data collection.

Instrumentation and Materials

Socio-demographics

A socio-demographic questionnaire was used to assess basic information about

the women's education, age, occupation, income, tribe/ethnic group, religious

affiliation, marital status and residence or neighborhood. Structured questions on

maternal characteristics related to participant's obstetric history such as the health

facility visited, previous birth experience, and place of delivery, gestation, parity,

gravida, and age on first pregnancy were also be included. Participants were also

asked about their preferred MoD using the question: "If you had uncomplicated pregnancy and had the choice to schedule for a cesarean or to wait for spontaneous vaginal birth, which one would you choose?"

Personality Traits

The Women's autonomy was assessed by the ACS-30. ACS-30 is a 30-item short version of the 50-item Autonomy Scale Autonomy Scale that measures autonomy of oneself in relation to others (Bekker & van Assen, 2006) in a Likert scale ranging from 1 to 5 at four levels, that is, self-awareness, sensitivity to others, capacity to manage new situations, and occupational self-efficacy.

The level of confidence and desire for self-control in relation to MoD was measured by use of the short version of the CBSEI-C32 in addition to asking the reasons in favor of a particular MoD. The short CBSEI-C32 is a 32-item, ten point Likert scale of helpfulness of a behavior (0 = not helpful at all, 10 = very helpful), used to assess the perceived capability of the woman to do specific coping behaviors during labor, and her perceived self-efficacy and the confidence in this ability to deal with the impending labor (Ip, 2007). It is made up of two parts: 1) the Self-efficacy expectancy for childbirth that assesses perceived ability to perform specific coping behaviors, and 2) the outcome expectancy that assesses the belief that good childbirth experience can be an outcome of involvement in the specific behavior (Ip, Chan, & Chien, 2005).

The women's self-esteem was measured using the RSE, a ten- item Likert scale (Rosenberg, 1965) measured on a 4-point scale ranging from 0 (strongly agree)to

3(strongly disagree). The positively worded items were reversed before self-esteem score is calculated, such that a higher score reflects greater self-esteem.

Fear of Childbirth

FoB or Tocophobia was assessed by W-DEQ A - a 33-item Likert-type and unidimensional scale (Alehagen, Wijma, & Wijma, 2006) ranging from 1 to 6 (extremely to not at all). Participants were asked for instance how they think they will feel during the labor and delivery to that assess pre-partum feelings and thoughts regarding childbirth. The higher the W-DEQ scores the more the severity of FoB.

Pain Avoidance

Extent of perceived labor pain expected by the participant as it influences the choice of MoD was assessed using the modified SF-MPQ (Grafton, Foster, & Wright, 2005). The SF-MPQ itself consists of 15 (11 sensory and4 affective) descriptors measured on an intensity scale of 0 (none) to 3 (severe) to compute three pain scores from the sum of sensory, affective and total descriptors' intensity rank values. After completing the SF-MPQ, participants were asked to indicate in a scale of 0 (no pain) to 10 (the most intense pain possible) how much pain they would likely experience during spontaneous vaginal delivery on the VAS.

Preservation of sexual function

The consideration for the preservation of the woman's sexual function in selecting the MoD was assessed by FSFI in complement with the BISCS. The 19-item scale FSFI is divided into six domains that include pain, desire, sexual arousal,

lubrication, orgasm, and satisfaction (Verit, F., & Verit, A., 2007). Sexual function in this scale is assessed on a score of one (lowest) to six (highest level).

BISCS is a 15-item each rated on a scale of 1 (Never) to 6 (Always) to assess women's sexual self-consciousness in a sexual relationship. The higher the BISCS score the greater the self-consciousness during sexual activities (Morrison, Doss, & Perez, 2009).

Perceived social support

The level of perceived support received by the woman was assessed by the MSPSS. The MSPSS with 12-items measures three sources of social support – friends, family, and significant other (Bruwer et al., 2008). The items are rated on a 1 to 7 Likert scales, indicating very strongly disagree and very strongly agree respectively. In a range of 12 – 84 total points, the higher the overall MSPSS points the greater the level of perceived social support.

Emotional health status

The level of pregnancy depression was assessed by the EPDS. The scale has 10 items that can assess the feeling of depression by a pregnant woman in the previous 7 days (Gibson et al., 2009). The items have four possible responses scored differently from 0 to 3. With a highest possible score of 30, women who score above 10 are likely to experience depression of varying severity during the pregnancy.

The STAI for adults (STAI form Y) was used to evaluate global anxiety among the participants. The 40-item STAI-Y is divided into two sections, each with 20 statements and serving as indicators of the two corresponding forms of anxiety: the

state anxiety and trait anxiety, and measure in addition the severity of the overall level of anxiety (Alderdice, Lynn, & Lobel, 2012). The items are arranged in order such that the numbers show positive correlation to the anxiety related to in the question. The responses are in a 4-point Likert scale with a minimum point of 1 (not at all) and a maximum point of 4 (very much so) for the State Anxiety Scale (STAI-S) and based on the frequency from 1 (almost never) to 4 (almost always) for the Trait Anxiety Scale (STAI-T) yielding scores of from 20 to 80.

AIM, a 40 Likert-type items will be used to assess stress levels among the participants. AIM measures the intensity (strength or weakness) with which a person characteristically experiences positive and negative emotions (Solhan et al., 2009). The participant is asked to indicate how she reacts to 40 events in one of the six different options from 1 (Never) to 6 (Always).

Social convenience

The social convenience associated with the MoD considered as the ease with which the woman would desire to plan for time of day or day of the week for her delivery was assessed through a set of related questions. For example items borrowed from the convenience part of the instrument TSQM v. II (Atkinson, Kumar, Cappelleri, & Hass, 2005) were as follows:

How easy or difficult is it to:

- Schedule the time (day or night) of your delivery with CS/VB?

- Plan the day (weekday or weekend) of your delivery with CS/VB?

- Plan for my maternity leave days and work schedule with CS/VB?

- How convenient or inconvenient is it to go through a CS/VB?

- The items are assessed on a Likert scale that ranges from 1 (extremely difficult/ inconvenient) to 7 (extremely easy/ inconvenient).

Reliability & validity of the instruments

Autonomy Connectedness Scale (ACS-30) has been shown to be a valid psychometric instrument to assess autonomy or self-governance as well as interaction with others with good internal consistency (reliability). Factor analysis provided good similarity to the original autonomy scale with Cronbach's alpha values of 0.81, 0.82, and 0.83, for Self-Awareness, Sensitivity to Others, and Capacity for Managing New Situations subscale respectively (Bekker & van Assen, 2006). The internal consistency was comparable for all three subscales of original scale of between 0.8 and 0.85. ACS-30 showed strong correlation with Self-Efficacy at Work and replicated sex differences (women having higher levels of autonomy connectedness than men) and clinical relevance that were found with the original version demonstrating its validity. The 30-item Autonomy Connectedness Scale is not only short in length but is also less complicated in its 5-point scale rating compared to the 7-point scale of ACS-50 (Bekker & van Assen, 2006).

The *Childbirth Self-Efficacy Inventory (CBSEI-C32)* is not only culturally sensitive but also has tested validity and reliability in America (Lowe, 2007) and in different other translations and cultures such as in Spain (Cunqueiro, Comeche, & Docampo, 2009), Iran (Khorsandi et al., 2008), and in Indonesian, Japanese, Korean and Chinese communities (Ip, Chan, &Chien, 2005). In all instances, the tool is

reliable and valid as was shown by adequate internal consistency reliability with

Pearson's correlation, r = 0.40 − 0.96 and consistency with the Self-Efficacy Theory

by Bandura (1977) on predictors of childbirth self-efficacy. Principal components

analysis showed that the CBSEI is unidimensional and has the ability to distinguish

between outcome and self-efficacy expectancies.

The *Rosenberg Self-Esteem Scale (RSE)* is a valid and reliable unidimensional

scale (Schmitt, & Allik, 2005) of global self-esteem. The tool is originally a Guttman

scale with high enough reproducibility of 0.92 and scalability coefficients of 0.72

(Rosenberg, 1965). Others have reported different strengths of convergent validity

with Pearson's correlation ranging from rs 0.56 to 0.83 and significant association

between the RSE (Factor 1) and psycho-physiological indicators of anxiety,

depressive affect, and utilization of medical (psychiatric) resources. RSE predicts

delinquent behavior and depression with alpha values in excess of 0.85 in various

large studies in America, Hong Kong adolescents, and is used extensively in more

than 50 countries (Schmitt, & Allik, 2005).

The *Wijma Delivery Expectancy/ Experience Questionnaire (W-DEQ)* as a

tool has been shown to reliably measure fear of childbirth, with Cronbach's alpha of

0.88 for internal consistency reliability and split-half reliability reported in two

studies and alpha coefficient of up to 0.89 by its authors (Wijma et al., 1998) and in a

recent study using the Turkish version (Korukcu, Kukulu, & Firat, 2012), well above

the score of 0.70 criterion for internal consistency. The simplicity of VAS promotes

high compliance and combining the W-DEQ and VAS − itself with a reliability score

of 0.76 to 0.91 (Boonstra et al., 2008; Hasson & Arnetz, 2005) would give more information on the predictive value of fear of childbirth on ECS decisions.

The *Short-form McGill Pain Questionnaire (SF-MPQ)* is an extensively investigated and translated instrument used in assessing the pain experience. It is a valid, reliable, and responsive instrument for assessing acute or chronic pain experience in different types of patients. It incorporates the features of and correlates highly with the standard McGill Pain Questionnaire (MPQ) but requires shorter time, 2-5 minutes (Grafton, Foster, & Wright, 2005) to administer. It has a good internal consistency with Cronbach's alpha of 0.705 and 0.713 for test and retest respectively (Yakut, Y., Yakut, E., Bayar, & Uygur, 2007). Other studies confirm validity of the structure of the SF-MPQ and its usefulness even after translation into several other languages and across different cultural setups (Zinke, Lam, Harden, &Fogg, 2010). The multidimensional SF-MPQ is more reliable than the unidimensional scales such as VAS for assessing chronic pain where affective components, an important aspect of pain are involved.

The other pain-rating scale used for assessing pain – VAS is also validated and found reliable for use in clinical settings (Williamson & Hoggart, 2005) with alpha coefficient of.85-.90. The VAS is comparable to Likert scales with regard to reliability and validity and yield similar results (Sindhu, Shechtman, & Tuckey, 2011), is more responsive, that is, assesses more closely what patients actually experience, and is more appropriate among less educated raters or respondents (Williamson, & Hoggart, 2005).

The *Female Sexual Function Index (FSFI)* tool has been validated among cases of sexual arousal disorder and nonclinical controls matched by age (Wiegel, Meston, & Rosen, 2005). The study reported both high test–retest reliability (r = .79–.86) for individual domains, high internal consistency (Cronbach's alpha of ≥ .82) and significant variance between the two (patient and the control) groups (*p*<.001). Evidence of discriminant validity of the FSFI instrument has also been found in successive studies (Ter Kuile, Brauer, & Laan, 2006). A psychometric evaluation conducted by Wiegel, Meston, and Rosen (2005), consequently developed a cut-off (a Total-FSFI score of 26.55) that is able to diagnose women with sexual dysfunction. Gerstenberger et al. (2010) reported high sensitivity (92%) and specificity (89%) of the tool for predicting sexual desire disorder. Higher scores on the FSFI imply fewer problems with sexual functioning.

Wiederman's *Women's Body Image Self-Consciousness Scale (BISCS)* measures the self-consciousness in hetero-sexual experience and relationship with high overall internal consistency. The BISCS score correlates with other psychometric measures of sexuality with different internal consistency coefficients for a woman's sexual esteem (Cronbach's alpha .93), sexual anxiety (Cronbach's alpha = .81), sexual assertiveness (Cronbach's alpha .91), well-being (Cronbach's alpha .88), and sexual avoidance (Cronbach's alpha .87) [Verit, F., & Verit, A., 2007].

The BISCS's 15 items generated two factors with characteristic matrix values (eigenvalues) greater than one on a principal components factor analysis - an eigenvalue of 8.39 for the first factor that accounted for 56.0% of the variance and

eigenvalue of 1.06 for the second factor accounting for only 7.1% of the variance

(Morrison, Doss, & Perez, 2009). Furthermore the mean interitem correlation of .52

provided evidence for judging all the BISCS items as assessing the same construct

(Verit, F., & Verit, A., 2007).In another study, Schembri and Evans (2008) reported

use of BISCS with perfect internal consistency (Cronbach alpha of 0.96) and

adequate validity. Unlike other Body Image Questionnaires, the BISCS measures

behavioral body image, a specific domain of body image that is concerned with how

one's behaviors are affected by their thoughts and feelings about their body

(McDonagh, Morrison, & McGuire, 2008) and not the other two domains: Perceptual

or evaluative image (an individual's evaluation or appraisal of their body) or *affective*

body image (feelings and emotions about one's body). The Body Image Avoidance

Questionnaire (BIAQ) which was one of the tools to assess behavioral body image

does not significantly predict any of the sexual functioning domains - anxiety, esteem

and problems (Weaver & Byers, 2006).

The *Multidimensional Scale of Perceived Social Support (MSPSS)* of Zimet et

al. (1988) initially demonstrated moderate construct validity and good internal (rs =

0.88) and test-retest reliability (rs = 0.85) with low perceived social support showing

association with high depression and anxiety symptomatology levels as measured by

the Hopkins Symptom Checklist (Bruwer et al., 2008). The MSPSS reliably assess

social support in many other settings and across cultures including in Ugandan

population with good internal consistency at .83 and validity tests using exploratory

factor analysis and principal component analysis showing three interlinked

components and high loadings on the subscales (Nakigudde et al., 2009). The tool is also less liable to social desirability bias (Gottlieb, & Bergen, 2010), is short, easy to understand, and is gender-sensitive with girls reporting higher score on the friends scale than boys but boys scoring higher on the family support than girls (Rockhill et al., 2009).

The *Edinburgh Postnatal Depression Scale (EPDS)* is a widely used tool to assess perinatal depression and is available in many languages including English, Arabic, and French (Montazeri, Torkan, & Omidvari, 2007). The EPDS with only 10-items, administered in less than 5 minutes, and good validity and reliability, remains the most commonly used in research and clinical settings (Gaynes et al., 2005) in comparison to and in concurrent validity to other perinatal depression screening tools. Studies report internal consistency reliability (Chronbach's alpha coefficient) ranging from of .77 to .804 (Montazeri, Torkan, & Omidvari, 2007; Vivilaki et al., 2009) and yield two distinct and correlated sub scales (anxiety sub-scale and depression sub-scale) in both exploratory and confirmatory factor analyses (Jomeen & Martin, 2005). The EPDS scores also discriminate between cesarean and vaginal sub-groups with higher depression score among women with CS delivery than women with VD (Montazeri, Torkan, & Omidvari, 2007).

The 40-item *State-Trait Anxiety Inventory* of Spielberger et al. (1970) is the most commonly utilized anxiety tool in measuring an individual's present or temporary (state) and the general enduring (trait) anxiety with translations in many languages for cross-cultural contexts (Kvaal et al., 2005). It has two 20-item

sections, each evaluating the two forms of anxiety. The STAI-T for instance measures a stable tendency to experience anxiety, and the propensity to perceive stressful conditions as threatening. The STAI Form Y is a validated assessment tool for separate self-report measurements of state and trait anxiety. The reliability of STAI-Y is attested to by the similarities of various studies and the author's correlations of a .54 (state) and .86 (trait) for the test-retest reliability (Kvaal et al., 2005). A revised Chinese version of the STAI was validated among Chinese populations in Hong Kong with high (0.73-0.86) test-retest reliabilities for the trait and a concurrent validity of between 0.73 and 0.85 confirming good validity and reliability for the instrument (Shek, 1993; Leung et al., 2006).However, the trait scale of the STAI has been found to assess not anxiety alone but both depression (sadness and self-deprecation) and anxiety (anxiety and worry). Furthermore the two subscales correlate differentially with other ratings of anxiety and depression with a view that both have overlapping and distinct features (Alderdice, Lynn, & Lobel, 2012).

The *Affect Intensity Measure (AIM)* remains the principal measure of affect intensity with wide use in research and with translation into several languages; has been shortened and with lowered reading levels and has more established validity compared to other measures of affect intensity such as Emotional Intensity Scale, Affect Intensity Questionnaire, Intensity and Time Affect Survey, and Scenario rating Task (Solhan et al., 2009). AIM has a high discriminant validity to distinguish between frequency and intensity of emotional experience and between negative and

positive affect intensity (Lucas, Diener, & Larsen, 2009). The 40-item AIM has

excellent internal consistency with coefficient alpha of between .90 and .94 in four

separate groups, split-half correlations of .73 - .84, meant item total correlations of

.41 - .51, and a 3-month test-retest correlations of .81 (Lucas, Diener, & Larsen,

2009; Schimmack, 2007).

The *Treatment Satisfaction Questionnaire for Medication version II (TSQM v.

II)* is a shorter version derived from the 14-item TSQM v I, and is a valid and reliable

instrument in assessing clients' satisfaction with medication. It provides scores on

four subscales (Atkinson et al., 2004) – side effects, convenience, effectiveness, and

global satisfaction (items 12 to 14). Factor analysis showed TSQM v. II is a strong

dimensional instrument explaining 88% of the total pooled variance with the

subscales (Atkinson, Kumar, Cappelleri, & Hass, 2005). The TSQM v. II though has

fewer items, retains the rating functions of the 18-item TSQM v. I and has more

consistent wording (Atkinson et al., 2005). Furthermore, the convenience domain of

TSQM has shown the strongest association with medication adherence ($rs = 0.46$),

effectiveness ($rs = 0.38$), and global satisfaction ($rs = 0.34$) in that order even in the

exclusion of the side effects (TSQM-9) domain (Bharma et al., 2009). However, a

previous TSQM validation study showed that global satisfaction is strongly

associated with medication adherence domain (Atkinson et al., 2005). Bharma et al.

(2009) also reported satisfactory test-retest consistency, with high intra-class

correlation coefficients greater than 0.70.

Data Analysis

Data was entered, cleaned, processed and analyzed using SPSS v20. Analysis of univariate variables was conducted to summarize the distribution of individual factor and outcome variables. The hypotheses of no differences within and between the groups was tested using non parametric Chi-square based across categories of MoD (ECS or VB), for the categorical factors such as educated or not, type of health facility visited, married or not; and for ordinal variables such as occupation, education level and parity. Analysis of the findings was based on 80% statistical power, 5% *alpha* for a 2-tailed test (Burkholder, 2009).

Research Question #1: Does the incidence rate of cesarean section deliveries (including elective cesarean sections) in the two obstetric facilities in Nairobi meet the UN and NIH recommendation of at or below 15%?

H_{01}: Incidence rate of CS < 15%

H_{A1}: Incidence rate of CS ≥ 15%

Statistical Analysis: Frequency (percent) distribution of the cesarean cases in the study, followed by a binomial test on whether the rate is below 15%.

Research Question #2: Is the proportion of CS deliveries that are elective greater than the median proportion of 5%?

H_{02}: Incidence rate of ECS < 5%

H_{A2}: Incidence rate of ECS ≥ 5%

Statistical Analysis: Frequency (percent) distribution of the cesarean cases that are elective, followed by a binomial test on whether the rate is below 5%.

Research Question #3a: Is a woman's personality traits, as measured by the ACS-30, CBSEI-C32, and RSE, associated with ECS?

H_{03a}: There is no association between ECS and a woman's personality traits as measured by the ACS-30, CBSEI-C32, and RSE.

H_{A3a}: There is an association between ECSand a woman's personality traits

Statistical Analysis: One-way ANOVA test (Kruskal Wallis test if not normally distributed) will be conducted between ECS as dependent variable and personality scores as independent variable. Maternal age and marital status will be considered as possible covariates in the analysis, and significance of associations assessed at 95% confidence level.

Research Question #3b:Is there an association between a woman's sexual function, as measured by the BISCS and FSFI, and ECS?

H_{03b}: There is no association between a woman's sexual function, as measured by the BISCS and FSFI, and ECS

H_{A3b}: There is an association between a woman's sexual function, as measured by the BISCS and FSFI, and ECS

Statistical Analysis: One-way ANOVA test (Kruskal Wallis test if not normally distributed) will be conducted between ECS as dependent variable and sexual function scores as independent variable. Maternal age, education, occupation, religion and marital status will be considered as possible

covariates in the analysis, and significance of associations assessed at 95% confidence level.

Research Question #3c: Is there an association between ECS and a woman's fear of childbirth as measured by the W-DEQ?

> H_{03c}: There is no association between ECS and a woman's fear of childbirth as measured by the W-DEQ

> H_{A3c}: There is an association between ECS and a woman's fear of childbirth as measured by the W-DEQ

Statistical Analysis: One-way ANOVA test (Kruskal Wallis test if not normally distributed) will be conducted between ECS as dependent variable and W-DEQ scores as independent variable. Maternal age, education, parity, and marital status will be considered as possible covariates in the analysis, and significance of associations assessed at 95% confidence level.

Research Question #3d: Is there an association between ECS and perceived labor pain as measured by the SF-MPQ?

> H_{03d}: There is no association between ECS and perceived labor pain as measured by the SF-MPQ and VAS

> H_{A3d}: There is an association between a woman's perceived labor pain as measured by the SF-MPQ and VAS, and ECS ($p < .05$)

Statistical Analysis: One-way ANOVA test (Kruskal Wallis test if not normally distributed) will be conducted between ECS as dependent variable and scores on perceived pain as independent variable. Maternal age,

education, parity, and marital status will be considered as possible covariates

in the analysis, and significance of associations assessed at 95% confidence

level.

Research Question #3e: Is there an association between ECS and perceived

social support as measured by the MSPSS?

> H_{03e}: There is no association between ECS and perceived social
>
> > support as measured by the MSPSS
>
> H_{A3e}: There is an association between ECS and perceived social
>
> > support as measured by the MSPSS

Statistical Analysis: One-way ANOVA test (Kruskal Wallis test if not

normally distributed) will be conducted between ECS as dependent variable

and MSPSS scores as independent variable. Maternal age, education,

occupation, neighborhood, type of facility, and marital status will be

considered as possible covariates in the analysis, and significance of

associations assessed at 95% confidence level.

Research Question #3f: Is there an association between ECS and a woman's

pregnancy-related emotional health status?

> H_{03f}: There is no association between ECS and a woman's pregnancy-
>
> > related emotional health status
>
> H_{A3f}: There is an association between ECS and a woman's pregnancy-
>
> > related emotional health status

Statistical Analysis: One-way ANOVA test (Kruskal Wallis test if not normally distributed) will be conducted between ECS as dependent variable and scores on pregnancy related stress and depression as independent variables. Maternal age, education, parity, occupation, neighborhood, type of facility, and marital status will be considered as possible covariates in the analysis, and significance of associations assessed at 95% confidence level.

Research Question #3g: Is there an association between ECS and social convenience factors (ease of planning the day of delivery, time of delivery, maternity leave and work schedule, length of delivery process, and ready availability of the delivery services)?

H_{03g}: There is no association between ECS and social convenience factors

H_A: There is an association between ECS and social convenience factors

Statistical Analysis: Non-parametric Chi-square test will be conducted between ECS as dependent variable and convenience level as independent variable. Maternal occupation, education, socio-economic status, type of facility, and marital status will be considered as possible covariates in the analysis, and significance of associations assessed at 95% confidence level.

Research Question #4: Is elective cesarean section delivery predicted by a set of psychosocial factors among women attending prenatal services in Nairobi in a multiple logistic model?

H_{04}: Psychosocial measures do not predict the incidence of ECS

among pregnant women in Nairobi

H_{A4}: Psychosocial measures predict the incidence of ECS among

pregnant women in Nairobi.

Statistical Analysis: A series of binary logistic regression will be performed

with psychometric scores of one predictor at a time against the outcome

variable (MoD), estimating the direction and strength of association by odds

ratios (OR) with 95% confidence intervals (CI) and retaining only those with

$p<.25$ for multiple logistic regression modeling. All factors that are

psychosocially plausible and those with at least borderline significance ($p<.1$)

will be fitted into the multinomial logistic model to determine the effect of

each factor independently on the choice of MoD, taking into account the

covariates (such as maternal age, occupation, education level, socioeconomic

status or social class). Multiple logistic regression analysis will be used to

develop a model and to test significant determinants of ECS.

Threats to Validity

A possible threat to validity inherent in this cohort design is potential losses to

follow-up and limited generalizability given the institutional set-up. A further

potential threat is exposure misclassification, which may result in measurement bias

i.e. classifying some participants into wrong groups (VB, CS) at the beginning of the

study, or participants changing their choice during the follow-up period as the date of

delivery approaches.

Steps were taken to minimize loss to follow-up bias, by reviewing obstetric records at the facilities, telephone tracks and enforcing a protocol with the hospital administration to trace the participants when they came to the hospitals for their 6th week post-natal appointment. Threat to misclassification was reduced by recording the actual MoD at the post-natal interview and checking for any change of intention.

Ethical Considerations

The proposal and research protocol was subjected to an ethical review by the University's Institutional Review Board (IRB) and Kenyatta National Hospital/University of Nairobi Ethical Review Committee (ERC) as well as Pumwani Maternity Hospital Ethical Review Committee in Kenya to comply with the university's ethical principles and Kenya's government regulations. The research was presented for review and clearance obtained from the IRB as it involves expectant women as participants and touches on a sensitive area (APA Manual, 2010, pp. 61-76) of reproductive health and public health importance, elective cesarean section.

Ethical concerns in the ECS study focused around ways to 1) protect the pregnant women from pressure to participate, any safety and privacy risks, and information collected from them; 2) sampling strategy with clear inclusion and exclusion criteria; 3) obtaining permission to use copyrighted or published instruments for the study.

The approval of proposal was before data collection including pre-test on a sample population preceded by: 1) seeking IRB approval for the research methods, tools and protocols, 2) seeking permission from copyright holders or providing

confirmation that the tool is in public domain to use, and/or reproduce, 3) defining a clear recruitment criteria and exclude the minors (<18 years) by screening for age and other persons who are not eligible. An invitation to participate in the research was be put in the notice boards of the respective study clinics specifying these criteria and potential participants screened (using a screening form) to identify those that met the criteria.

The study objectives and protocol/ procedures were clarified to the women and their informed consent obtained before they took the interview. Participants were notified of their right to freely choose whether or not to participate in the study, emphasizing the fact that their refusal or participation would not affect their regular access to health education, healthcare, or any other hospital services. Participants were also informed of their right to withdraw from the study at any point if they so desired. Confidentiality was maintained for all participants' information and the information collected used for nothing else other than the purpose of the study. To ensure the security of data, the cover page for interviewer and interviewee records were plucked off after data entry; serial numbers were used to conceal any personal profile information/details; the questionnaires were kept only for a necessary duration in a safe lock in my study room, and the data saved in a password protected PC with password authorized only for the researcher, ensuring data back-up in encrypted USB and CD. There was no disclosure of personal information and the research assistants signed a confidentiality agreement form declaring not to disclose any such information. The researcher also singed a Data Use Agreement with the hospital

authorities specifying the type of records extracted and the information collected would not be used for any other purpose other than the research objectives.

Summary

In this chapter, the quantitative research method used in the study is discussed. The prospective cohort of 1359 (sample size was 1400) pregnant women in two selected maternity hospitals in Nairobi were interviewed using 10 validated instruments measuring various psychosocial factors and followed up for their actual MoD. Justification is provided for the choice of the design and the different study tools to use in the measurement of the psychosocial variables. The data collection and analysis plans used including statistical tests performed for each research question are also outlined.

Chapter 4: Results

The purpose of the current study was to quantitatively examine to what extent and which psychosocial factors determine women's choice of MoD with particular reference to elective cesarean sections in two selected obstetric facilities in Nairobi, Kenya. One exploratory hypothesis and three directional hypotheses were tested using a variety of statistical techniques. This chapter presents the results of these analyses and also provides a description of the participants sampled in this study.

Sample Demographics

Over a five-month period between May and September 2014, a total of 1,652 pregnant women gave their informed consents to participate in the study. Of the 1,652 that were screened, 293 women did not meet the inclusion criteria and were excluded from the study. Still, of the 1,359 eligible participants, 1,268 (93%) successfully completed and returned the questionnaires. Ninety-one (6.7%) of the eligible participants who had initially indicated their willingness to participate in the study withdrew at the different stages of the interview after either failing to return the questionnaire or returning incomplete questionnaires indicating not feeling well, the length of the tool and lack of sufficient time for the interview. Figure 2 presents the screening process for study participants.

Total Screened
(*N*=1652)

Excluded (*n*=293)
- Previous CS (*n*=163)
- Previous birth complication (*n*=35)
- Medical indications (*n*=93)
- Under- or over- age (*n*=4)
- Illiteracy (*n*=15)

Withdrawals
(*n*=91)

Completed Study (*n*=1268)
- KNH (*n*=462)
- PMH (*n*= 805)

Preferred CS
(*n*=288)

MoD Undecided
(*n*=61)

Preferred VD
(*n*=916)
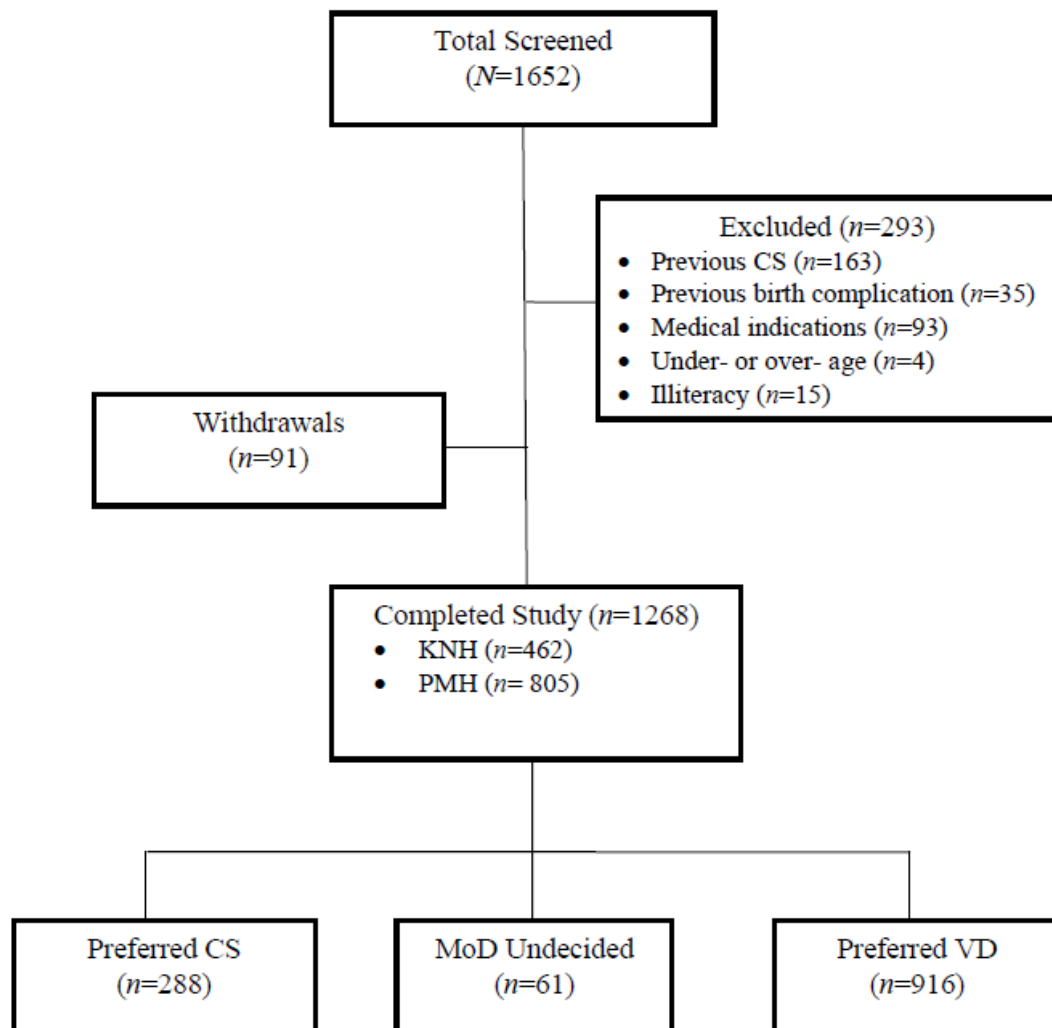
Figure 2. Flow chart showing the screening and selection process for participants.

A majority (62.8%) of those who responded were between 26 and 35 years old
with a mean age 28 years. Most respondents were married (87%) and professed the
Christian faith (97%). A majority had a secondary level of education (46.3%) while

24% had attained university education. Overall, the respondents had a mean of 12 years of education.

On ethnicity, majority indicated they were from the major ethnic groups thus, Kikuyu (47.3%), Kamba (15.1%), Luo (12.1%) and Luhya (11.0%). The rest were from the minority ethnic groups. The demographic characteristics of the study sample reflected the diversity in socio-cultural demographics of Nairobi County (CBS, 2009). Table 1 summarizes the demographic characteristics of the study sample.

Table1

Sociodemographic Characteristics of the Study Sample

Characteristic	KNH (*n* = 462)		PMH (*n* = 805)		Total (*N* = 1268)	
	n	%	*n*	%	*n*	%
Age bracket:						
18-25 years	144	31.2	254	31.6	398	31.4
26-35 years	271	58.7	524	65.1	796	62.8
36-45 years	47	10.2	27	3.4	74	5.8
Mean maternal age (years)	28.6	±4.9		±4.3	27.6	±4.3
Education level (*n* = 1266):						
Primary education	43	9.3	227	28.3	271	21.4
Secondary education	159	34.4	427	53.2	586	46.3
Technical/polytechnic	57	12.3	50	6.2	107	8.5
University/college	203	43.9	99	12.3	302	23.9
Mean years of education	13.6	±2.6			12.3	±2.8
Marital Status (*n* = 1264):						
Married	406	87.9	697	87.0	1104	87.3
Single/unmarried	49	10.6	94	11.7	143	11.3
Separated/divorced	6	1.3	6	.7	12	.9
Widowed	1	.2	4	.5	5	.4
Religion/Faith (*n* = 1265):						
Christian	453	98.1	773	96.4	1227	97.0
Muslim	9	1.9	28	3.5	37	2.9
Hindu	0	0.0	1	.1	1	.1
Occupation (*n* = 1264):						
None	98	21.2	386	48.1	485	38.4
Informal employment	33	7.1	64	8.0	97	7.7
Self- employment	206	44.6	273	34.0	479	37.9
Formal employment	124	26.8	79	9.9	203	16.1
Ethnicity:						
Kikuyu	248	53.7	352	43.7	600	47.3
Luhya	51	11.0	89	11.1	140	11.0
Luo	46	10.0	108	13.4	154	12.1
Kamba	49	10.6	142	17.6	192	15.1
Kisii	25	5.4	16	2.0	41	3.2
Kalenjin	7	1.5	10	1.2	17	1.3
Meru	12	2.6	17	2.1	29	2.3
Maasai	1	.2	2	.2	3	.2
Mijikenda	2	.4	6	.7	8	.6
Somali	0	0.0	7	.9	7	.6
Others	12	2.6	13	1.6	25	2.0
Didn't respond	9	1.9	43	5.3	52	4.1

Sample Obstetric Profile

About 19% of the study participants were in their first pregnancy and only

1.3% sought delivery services from the private wing of KNH. A majority (59.2%) of

the participants was primiparous at the time of the interview and about 15% were

expecting their first live births. The mean age at first pregnancy was 22.3 years (SD

= ±3.6) based on the participant's recall. Most women had their first antenatal

appointment on their fourth month of gestation (mean 4.0±1.5 months) and majority

checked their pregnancy regularly (91.8%) thereafter and attended the monthly

antenatal clinic classes regularly (72.1%).

Table 2
Obstetric Profile of the Study Sample (N = 1268)

Characteristic	KNH (n = 462)		PMH (n = 805)		Total (N = 1268)	
	n	%	n	%	n	%
Type of services offered (n = 1248):						
Public	447	96.8	784	99.9	1232	98.7
Private	15	3.2	1	.1	16	1.3
Gravida (n = 1268):						
Primigravida (Gravida I)	146	31.6	96	11.9	242	19.1
Multigravida (Gravida>1)	316	68.4	709	88.1	1026	80.9
Parity (n = 1264):						
Nullipara (0 live birth)	117	25.4	78	9.7	195	15.4
Primipara (1 live birth)	201	43.6	547	68.2	748	59.2
Para II (2 live births)	113	24.5	130	16.2	244	19.3
Para III (3 live births)	23	5.0	37	4.6	60	4.7
Para IV (4 live births)	3	.7	8	1.0	11	.9
Para V (5 live births)	3	.7	2	.2	5	.4
Mean number of live births	1.2	±0.9	1.2	±0.7	1.2	±0.8
Mean age at first pregnancy	23.9	±3.9	21.4	±3.0	22.3	±3.6
Mean time (months) of first visit	4.0	±1.5	4.0	±1.4	4.0	±1.5
Regularly check pregnancy (n = 1267):	415	89.8	748	92.9	1163	91.8
Regularly attend ANC classes:	378	81.8	535	66.5	913	72.1
Preferred MoD (n = 1265):						
Vaginal birth	351	76.1	565	70.3	916	72.4
Cesarean section	76	16.5	212	26.4	288	22.8
Undecided	34	7.4	27	3.4	61	4.8

Asked if they had uncomplicated pregnancy and had the choice to schedule

for a cesarean or to wait for spontaneous vaginal birth, 72.4% responded that they

would choose vaginal delivery (VD), 22.8% selected cesarean section (CS) and a

further 4.8% were undecided. The summary of the participants' obstetric profile is

provided in Table 2.

Reasons mostly given by those who selected VD included safety for both

mother and child (29.8%), that it is the cultural norm (28.9%) or it is associated with

quick recovery after delivery (28.4%). As shown in Table 3, the CS option group on

the other hand reported safety for mother and child (60.8%), pain avoidance (13.2%),

convenience in planning (7.3%) and fear of childbirth (5.6%) as the reasons for the

preference.

Table 3
Reasons for Preferred MoD (N = 1263)

	VD (n = 917)		CS (n = 288)		Undecided (n = 58)		Total (N = 1263)	
Characteristic	n	%	n	%	n	%	n	%
Reasons for preferred MoD								
It is the norm/stylish	265	28.9	13	4.5	5	8.6	283	22.4
Safety of mother/child	273	29.8	175	60.8	14	24.1	462	36.6
Pain avoidance	13	1.4	38	13.2	6	10.3	57	4.5
Fear of childbirth	1	.1	16	5.6	11	19.0	28	2.2
Maintain sexual function	2	.2	10	3.5	1	1.7	13	1.0
Convenience in planning	60	6.5	21	7.3	1	1.7	82	6.5
Cost of delivery	12	1.3	1	.3	4	6.9	17	1.3
Quick post-partum recovery	260	28.4	4	1.4	8	13.8	272	21.5
Peer's influence	4	.4	2	.7	1	1.7	7	.6
Spouse's preference	10	1.1	5	1.7	6	10.3	21	1.7
No apparent reason	17	1.9	3	1.0	1	1.7	21	1.7

Incidence Rates for CS

Hypothesis 1

The first hypothesis sought to test whether or not the incidence or prevalence

rate of cesarean section (CS) deliveries (including elective cesarean sections) in the

two obstetric facilities in Nairobi meet the United Nations and National Institute of

Health recommendation of at or below 15%. To test this hypothesis the frequency

(percent) distribution of the cesarean cases in the study was determined, followed by

the binomial test on whether the rate is below 15%.

Table 4
The Prevalence of CS Deliveries in the Two Hospitals – KNH and PMH

Characteristic	*N*	*n*	%
Prevalence of CS			
Kenyatta National Hospital (KNH)	441	121	27.4
Pumwani Maternity Hospital (PMH)	771	73	9.5
Total	1212	194	16.0

Table 5
Binomial Analysis for CS Rates in the Two Hospitals - KNH and PMH

		Category	*N*	Observed Prop.	Test Prop.	Exact Sig. (1-tailed)
KNH	Group 1	CS	121	.27	.15	.000[a]
	Group 2	VB	320	.73		
	Total		441	1.00		
PMH	Group 1	CS	73	.09	.15	.000[a]
	Group 2	VB	698	.91		
	Total		771	1.00		
Overall	Group 1	CS	194	.16	.15	.176[a]
	Group 2	VB	1018	.84		
	Total		1212	1.00		

[a] Alternative hypothesis states that the proportion of cases in the first group < .15

As shown in Table 4, the overall prevalence of CS was 16.0% in the two

hospitals; 27.4% in KNH and 9.5% in PMH. Based on the binomial test, the overall

CS rates were not statistically higher than the recommended 15%; actually lower than 15% in PMH (p <0.001). However, CS rates were significantly higher (Table 5) than the recommended 15.0% (p < 0.001) in KNH.

Based on the hospital records of types of births over the 5 months period of May-September, and using the formula:

$$Incidence_{Rate} = \frac{number.of.newcases}{\frac{1}{2}(Population_1 + Population_2)} X(person.times)$$

The total CS incidence rate for the two hospitals was 8.3% per month or 83 cesarean sections per 1000 deliveries per month. Table 6 shows the delivery records from the two hospitals in the period May-September 2014.

Table 6
Incidence Rate of CS from the Obstetric Records in KNH and PMH

Facility	Indicator	Month (2014)				
		May	June	July	Aug	Sep
KNH (Public Wing)	Total registered	2172	2424	2625	2106	2015
	Total deliveries	1175	1103	1250	1265	1019
	CS deliveries	742	407	449	423	367
KNH (Private Wing)	Total deliveries	86	106	76	75	76
	CS deliveries	45	68	46	37	43
PMH	Total registered	2117	2073	2061	2103	2066
	Total deliveries	1880	1959	1844	1885	1758
	CS deliveries	463	490	471	467	431
Total	Total registered	4289	4497	4686	4209	4081
	Total deliveries	3141	3168	3170	3225	2853
	CS deliveries	1250	965	966	927	841

Note. Summary of obstetric records accessed October 8, 2014 from the Health Information Departments, KNH and PMH during the study period.

Analyzed by facility, the CS incidence rates are 6.4% (64 CS/1000 deliveries/month), 10.9% (109 CS/1000 deliveries/month) and 14.8% (148 CS/1000 deliveries/month) for PMH, KNH (public wing) and KNH (private wing) respectively.

Incidence Rates for ECS

Hypothesis 2

The second hypothesis sought to test whether or not the prevalence of elective

cesarean section deliveries in the two obstetric facilities in Nairobi was below or

equal to 5%. To test this hypothesis the frequency (percent) distribution of the

elective cesarean cases in the study was conducted, followed by binomial test on

whether the rate is below or equal to 5%. The overall prevalence of ECS was 6.4% in

the two hospitals; 8.2% in KNH and 5.3% in PMH. Table 7 shows the prevalence of

ECS by maternity facility. The overall ECS rates were significantly higher than the

postulated 5.0% ($p = 0.021$), and separately higher in KNH ($p = 0.021$), but similar in

PMH. The results of the binomial test for ECS are presented in Table 8.

Table 7

The Prevalence of ECS Deliveries in the Two Hospitals - KNH and PMH

Characteristic	N	n	%
Prevalence of ECS			
Kenyatta National Hospital (KNH)	441	36	8.2
Pumwani Maternity Hospital (PMH)	771	41	5.3
Total	1212	77	6.4

Table 8

Binomial Analysis for ECS Rates ≤5% in the Two Hospitals - KNH and PMH

	Category	N	Observed Prop.	Test Prop.	Exact Sig. (1-tailed)
	ECS	36	.08	.05	.003 [a]
KNH	NECS	405	.92		
	Total	441	1.00		
	ECS	41	.05	.05	.365 [a]
PMH	NECS	730	.95		
	Total	771	1.00		
	ECS	77	.06	.05	.021 [a]
Overall	NECS	1136	.94		
	Total	1213	1.00		

Nonparametric Analysis of Variance

Hypothesis 3

Hypothesis 3 sought to test the main psychosocial factors associated with ECS deliveries in the selected two hospitals in Nairobi from a set of factors. *Hypothesis 3a* predicted that participants who reported stronger personality traits, as measured by higher the ACS-30, CBSEI-C32, and RSE scores would report higher prevalence of ECS than women who reported lower scores. A Kruskal-Wallis test was conducted to

compare median or mean ranks between the different MoD since the distribution of

scores for the three scales did not meet the normality test**.**

The results of the Kruskal-Wallis test showed a statistically significant

difference in personality trait as measured by ACS-30 score between the three modes

of delivery, $\chi^2(2, 1207) = 14.113$, $p = .001$, with a mean rank ACS score of 748.07

for elective cesarean section (ECS), 587.88 for non-elective cesarean section (NECS)

and 594.90 for vaginal delivery (VD). Table 9 shows the results of the Kruskal-Wallis

test for ECS, NECS and VB groups. To determine the two groups with significant

ACS-30 score distributions, a pair wise post-hoc analysis was conducted using the

Mann-Whitney test.

Table 9
Kruskal-Wallis Test forMeasures of Personality Trait among MoDGroups

	Ranks			Test Statistics[a,b]		
	MoD	*N*	Mean Rank	χ^2	*df*	*p*
Autonomy Connectedness Scale	VD	1014	594.90	14.113	2	.001
	NECS	116	587.88			
	ECS	77	748.07			
	Total	1207				
Rosenberg Self-Esteem Scale	VD	1015	599.67	3.184	2	.204
	NECS	116	601.33			
	ECS	77	672.97			
	Total	1208				
Childbirth Self-Efficacy Inventory	VD	1134	601.30	1.695	2	.429
	NECS		645.87			
	ECS	77	608.12			
	Total	1211				

Note. a. Kruskal-Wallis Test
Note. b. Grouping Variable: MoD

The distribution of scores differed significantly between the ECS and VD

groups with median ACS-30 scores of 93.0 and 91.0 respectively, $U = 29133.0$ (77,

1019), $Z = -3.719$, $p < .001$ and between ECS and NECS, which had a median ACS-

30 score of 90.0, $U = 3278.5$ (77, 116), $Z = -3.127$, $p = .002$. The other two

dependent factors RSE and CBSEI-C32 did not, however, show any difference

among the modes of delivery ($p>.05$). Results of the Mann-Whitney test are presented

in Table 10.

Table 10
Mann-Whitney Test for ACS Scores between ECS and VD Groups

	Ranks			**Test Statistics**[a]		
	MoD	*N*	Mean Rank	*U*	*Z*	*p*
Autonomy Connectedness Scale	VD	1014	536.23	29133.00	-3.719	.000
	ECS	77	674.65			
	Total	1091				
	VD	1014	566.17	58129.00	-.205	.837
	NECS	116	559.61			
	Total	1130				
	NECS	116	86.76	3278.50	-3.127	.002
	ECS	77	112.42			
	Total	193				

Note. a. Grouping Variable: MoD

Hypothesis 3b predicted that a woman's sexual function, as measured by the

Body Image Self-Consciousness Scale (BISCS) and Female Sexual Functioning

Index (FSFI) is associated with prevalence of ECS. A Kruskal-Wallis test was

conducted to compare median or mean ranks between the different MoD since the

distribution of scores for the two scales did not meet the normality test**.**

The results of the Kruskal-Wallis test did not show a statistically significant difference in the distribution of BISCS scores ($p = .077$) and FSFI ($p = .585$) among the three groups of VD, NECS, and ECS. From the Mann-Whitney test of the distribution of the BISCS and FSFI scores between ECS and other MoD, the distribution of FSFI is the same across categories of ECS delivery and other MoD – elective or not ($p = .77$) and so is the distribution of BISCS across the categories of modes of delivery ($p = .958$); therefore, there is no association between a woman's sexual function, as measured by the BISCS and FSFI, and ECS. Results of the Kruskal-Wallis test and Mann-Whitney test for BISCS and FSFI are presented in Table 11 and Table 12 respectively.

Table 11
Kruskal-Wallis Test forMean Ranks of Sexual Function among Groups of MoD

	Ranks			**Test Statistics**[a,b]		
	MoD	*N*	Mean Rank	χ^2	*df*	*p*
	VD	1018	614.08	5.140	2	.077
Body Image Self-	NECS	116	536.43			
Consciousness Scale	ECS	77	603.99			
	Total	1211				
	VD	1004	594.76	1.073	2	.585
Female Sexual Function	NECS	116	628.53			
Index	ECS	77	609.77			
	Total	1197				

Note. a. Kruskal-Wallis Test

Note. b. Grouping Variable: MoD

Table 12

Mann-Whitney Test for BISCS and FSFI Scores between ECS and Other MoD

	Ranks			Test Statistics[a]		
	MoD	*N*	Mean Rank	*U*	*Z*	*p*
Body Image Self-Consciousness Scale	ECS	77	603.99	43504.00	-.052	.958
	Other Modes	1134	606.14			
	Total	1211				
Female Sexual Function Index	ECS	77	609.77	42290.50	-.283	.777
	Other Modes	1120	598.26			
	Total	1197				

Note. a. Grouping Variable: MoD

Hypothesis 3c predicted that a woman's fear of childbirth, as measured by the Wijma Delivery Expectancy-Experience Scale (W-DEQ) is associated with incidence of ECS. A Kruskal-Wallis test was conducted to compare median or mean ranks between the different modes of delivery, followed by Mann-Whiney test to compare if the difference exists between ECS and any one of the categories of mode of deliver**.**

The results of the Kruskal-Wallis test showed a statistically significant difference in fear of birth as measured by W-DEQ score between the three modes of delivery, $\chi^2(2, N = 1211) = 7.555, p = .023$, with a mean rank W-DEQ score of 711.12 for elective cesarean section (ECS), 588.04 for non-elective cesarean section (NECS) and 600.10 for vaginal delivery (VD). The results of Mann-Whitney test showed that the distribution of W-DEQ scores differed significantly between the ECS and VD groups with mean ranks of 642.11 and 540.88 respectively, $U = 31946.5$ (77, 1018), $Z = -2.709, p < .007$. Results of the Kruskal-Wallis and Mann-Whitney tests

for W-DEQ across the categories of MoD are presented in Table 13 and Table 14

respectively.

Table 13
Kruskal-Wallis Test for Mean Ranks of W-DEQ Scores among MoD Groups

	Ranks			Test Statistics[a,b]		
	MoD	*N*	Mean Rank	χ^2	df	*p*
	VD	1018	600.10	7.555	2	.023
Wijma Delivery	NECS	116	588.04			
Expectancy-Experience	ECS	77	711.12			
Questionnaire	Total	1211				

Note. a. Kruskal-Wallis Test

Note. b. Grouping Variable: MoD

Table 14
Mann-Whitney Test forDistribution of W-DEQ Scores between ECS and Other MoD

	Ranks			Test Statistics[a]		
	MoD	N	Mean Rank	*U*	*Z*	*p*
Wijma Delivery	ECS	77	642.11	31946.50	-2.709	.007
Expectancy-Experience	VD	1018	540.88			
Questionnaire	Total	1095				
	ECS	77	108.01	3618.50	-2.231	.026
	NECS	116	89.69			
	Total	193				
	NECS	116	556.85	57808.50	-.370	.712
	VD	1018	568.71			
	Total	1134				

Note. a. Grouping Variable: MoD

Similarly, the distribution of W-DEQ scores differed significantly between the

ECS and NECS groups with mean ranks of 108.01 and 89.69 respectively, *U* =

3618.5 (77, 116), Z = -2.231, *p* <.026. There is thus an association between ECS and

a woman's fear of childbirth as measured by the W-DEQ.

Hypothesis 3d tested whether or not a woman's perceived labor pain, as measured by the modified short form of McGill Pain Questionnaire (SF-MGP) and Visual Analog Scale (VAS) is associated with incidence of ECS. A Kruskal-Wallis test was conducted to compare median or mean ranks of SF-MPQ and VA scores between the different modes of delivery.

As presented in Table 15, the results of the Kruskal-Wallis test did not show a statistically significant difference in the distribution of SF-MPQ scores ($p = .136$) and VAS scores ($p = .219$) among the three groups of VD, NECS, and ECS.

Table 15
Kruskal-Wallis Test forPerceived LaborPain Scores among MoD Groups

Ranks				Test Statistics[a,b]		
	MoD	*N*	Mean Rank	χ^2	*df*	*p*
Short form of McGill Pain Questionnaire	VD	1015	606.98	3.994	2	.136
	NECS	115	549.61			
	ECS	77	645.96			
	Total	1207				
Visual Analog Scale	VD	1018	599.70	3.034	2	.219
	NECS	116	619.94			
	ECS	77	668.29			
	Total	1211				

Note. a. Kruskal-Wallis Test

Note. b. Grouping Variable: MoD

The distribution of SF-MPQ and VAS is the same across categories of MoD; therefore, there is no significant association between women's perceived labor pain, as measured by the SF-MPQ and VAS, and ECS. Results of the Kruskal-Wallis test for SF-MPQ and VAS are presented in Table 15.

Hypothesis 3e tested whether or not a woman's perceived social support, as measured by the Multidimensional Scale of Perceived Social Support (MSPSS) is associated with incidence of ECS. A Kruskal-Wallis test was conducted to compare median or mean ranks of MSPSS scores between the different modes of delivery.

The results of the Kruskal-Wallis test did not show a statistically significant difference in the distribution of MSPSS scores ($p = .058$) among the three groups of VD, NECS, and ECS. However when the source of social support is considered, the medians of perceived social support from friends [PSS-Fri] ($p = .006$) and perceived social support from family [PSS-Fam] ($p = .029$) were significantly different across the MoD groups. Results of the Kruskal-Wallis test and Median test for MSPSS and for different types of perceived social support are presented in Table 16.

The results of Mann-Whitney test showed that the distribution of scores PSS-Fri differed significantly between the ECS and VD groups with mean ranks of 447.70 and 555.59 respectively, $U = 31470.0$ (77, 1018), $Z = -2.897$, $p = .004$. The Mann-Whitney test also showed a significant difference in the distribution of MSPSS scores between the ECS and VD groups, with mean ranks of 468.01 and 554.05 respectively, $U = 33033.5$ (77, 1018), $Z = -2.304$, $p < .021$. Results of the Mann-Whitney test for MSPSS, PSS-Fri and PSS-Fam are presented in Table 17.

Table 16

Kruskal-Wallis and Median Tests forPerceived Social Support among MoD Groups

Ranks					Test Statistics[a]		
	MoD	*N*	Median	Mean Rank	χ^2	*df*	*p*
Perceived social support from family (PSS-Fam)	Vaginal	1018	23.0	615.41	5.133[b]	2	.077
	NECS	116	22.0	570.39	7.083[c]	2	.029
	ECS	77	22.0	535.19			
	Total	1211	23.0				
Perceived social support from friends (PSS-Fri)	Vaginal	1018	22.0	618.45	9.982[b]	2	.007
	NECS	116	22.0	567.95	10.394[c]	2	.006
	ECS	77	20.0	498.69			
	Total	1211	22.0				
Perceived social support from significant others (PSS-SO)	Vaginal	1018	24.0	607.44	1.717[b]	2	.424
	NECS	116	24.0	624.31	2.246[c]	2	.325
	ECS	77	23.0	559.42			
	Total	1211	24.0				
Multidimensional Scale of Perceived Social Support	Vaginal	1018	69.0	614.56	5.702[b]	2	.058
	NECS	116	68.0	588.84	4.741[c]	2	.093
	ECS	77	64.0	518.64			
	Total	1211	69.0				

Note. a. Grouping Variable: MoD
Note. b. Kruskal-Wallis Test
Note. c. Median Test

Table 17

Mann-Whitney Test for Perceived Social Support Scores between ECS and VD

Groups

	Ranks				**Test Statistics**[a]		
	MoD	*N*	Mean Rank	*U*	*Z*	*p*
	Vaginal	1018	553.07	34036.00	-1.934	.053
Perceived social support from family (PSS-Fam)	ECS	77	481.03			
	Total	1095				
	Vaginal	1018	555.59	31470.00	-2.897	.004
Perceived social support from friends (PSS-Fri)	ECS	77	447.70			
	Total	1095				
	Vaginal	1018	554.05	33033.50	-2.304	.021
Multidimensional Scale of Perceived Social Support	ECS	77	468.01			
	Total	1095				

Note. a. Grouping Variable: MoD

Hypothesis 3f

Hypothesis 3f tested whether or not a woman's emotional health status (pregnancy related stress, depression and anxiety) as measured by the Affect Intensity Measure (AIM), Edinburg Postnatal Depression Scale (EPDS) and the State-Trait Inventory for Adults (STAI-Y) is associated with incidence of ECS.

The results of the Kruskal-Wallis test showed a significant difference in the distribution of STAIY scores (p <.001) among the three groups of VD, NECS, and ECS for both S-anxiety scale (p <.001) and T-anxiety scale (*p* = .009). However, the distribution of scores were the same across the categories of MoD for AIM (*p* = .425) and EPDS (*p* = .902).Results of the Kruskal-Wallis test for AIM, EPDS, and STAIY among the different MoD groups are presented in Table 18.

Table 18

Kruskal-Wallis Test for Measures of Emotional Health among MoD Groups

	Ranks			**Test Statistics**[a,b]		
	MoD	*N*	Mean Rank	χ^2	*df*	*p*
	VD	1015	598.19	1.71	2	.425
Affect Intensity Measure	NECS	115	622.05			
(AIM) of Pregnancy Stress	ECS	76	646.31			
	Total	1206				
	VD	1018	606.57	.206	2	.902
Edinburgh Postnatal	NECS	116	592.06			
Depression Scale (EPDS)	ECS	76	611.72			
	Total	1210				
	VD	1012	585.02	15.28	2	.000
State Anxiety Scale for	NECS	115	695.04			
Adults (S-anxiety scale)	ECS	76	687.38			
	Total	1203				
	VD	1013	589.29	9.36	2	.009
Trait Anxiety Scale for	NECS	115	679.81			
Adults	ECS	76	661.58			
(T-anxiety scale)	Total	1204				
	VD	1013	584.98	16.46	2	.000
State-Trait Anxiety Scale for	NECS	115	705.32			
Adults (STAIY)	ECS	76	680.50			
	Total	1204				

Note. a. Kruskal-Wallis Test

Note. b. Grouping Variable: MoD

The results of Mann-Whitney test showed that the distribution of STAIY scores differed significantly between the ECS and VD groups with mean ranks of 625.44 and 538.96 respectively, $U = 32380.5$ (76, 1013), Z = -2.312, $p = .021$. The Mann-Whitney test specifically showed a significant difference in the distribution of scores of the S-anxiety scale between the ECS and VD groups, $U = 31909.5$ (76,

1013), $Z = -2.480$, $p = .013$, but not for the trait component (T-scale) of the anxiety

scale ($p = .08$). Results of the Mann-Whitney test for STAIY across the different

categories of MoD are presented in Table 19.

Table 19

Mann-Whitney Test for Distribution of Anxiety Scores between ECS and VD Groups

	Ranks			Test Statistics[a]		
	MoD	*N*	Mean Rank	*U*	*Z*	*p*
State Anxiety Scale for Adults (S-anxiety scale)	VD	1012	538.03	31909.50	-2.480	.013
	ECS	76	630.64			
	Total	1088				
Trait Anxiety Scale for Adults (T-anxiety scale)	VD	1013	540.44	33872.50	-1.749	.080
	ECS	76	605.81			
	Total	1089				
State-Trait Anxiety Scale for Adults (STAIY)	VD	1013	538.96	32380.50	-2.312	.021
	ECS	76	625.44			
	Total	1089				

Note. a. Grouping Variable: MoD

Hypothesis 3g tested whether or not social convenience factors (ease of

planning the day of delivery, time of delivery, maternity leave and work schedule,

length of delivery process, and ready availability of the delivery services) as

measured by woman's emotional health status (pregnancy related stress, depression

and anxiety) as measured by the Convenience Scale of the Treatment Satisfaction

Questionnaire for Medication (TSQM) is associated with incidence of ECS.

The results of the Kruskal-Wallis test (Table 20) did not show a statistically

significant difference in the distribution of scores of the convenience scale ($p = .774$)

among the three groups of VD, NECS, and ECS. Pair wise, the distribution of TSQM

is the same across categories of elective cesarean section delivery and other modes of

delivery – vaginal ($p = .826$) and non-elective ($p = .496$) and so there is no

significant association between a woman's convenience consideration for delivery

services and the MoD.

Table 20

Kruskal-Wallis Test for the Mean Ranks of Convenience Scores among MoD Groups

	Ranks			**Test Statistics**[a,b]		
	MoD	*N*	Mean Rank	χ^2	*df*	*p*
Convenience Scale Delivery Services (TSQM)	VD	1017	603.44	.513	2	.774
	NECS	116	625.87			
	ECS	76	594.01			
	Total	1209				
Convenience Scale Delivery Services (TSQM)	VD	1017	547.57	.048	1	.826
	ECS	76	539.36			
	Total	1093				
Convenience Scale Delivery Services (TSQM)	NECS	116	98.70	.463	1	.496
	ECS	76	93.14			
	Total	192				
Convenience Scale Delivery Services (TSQM)	VD	1017	564.87	.424	1	.515
	NECS	116	585.67			
	Total	1133				

Note. a. Kruskal-Wallis Test

Note. b. Grouping Variable: MoD

Multinomial Logistic Regression Analysis

Hypothesis 4

Hypothesis 4 tested whether or not, which and to what extent psychosocial

measures predict the incidence of ECS among pregnant women in Nairobi.

A series of binary logistic regression were performed with psychometric scores of one predictor at a time against the outcome variable (MoD), found that the addition of ACS [χ^2(df = 1), p <.001], W-DEQ [χ^2(df=1), p = .008] and STAIY [χ^2 (df = 1), p = .020] reduced the -2 Log Likelihood statistic significantly (improving the quality of the model) and added significantly to the intercept/constant only model (without independent variables). A Wald's test also found ACS (p <.001), W-DEQ (p = .010) and STAIY (p = .019) significantly distinguished between the ECS and other categories of MoD. The prediction had an accurate classification rate of 93.6%. However, the other psychosocial factors did not add significantly to the binary model (p>.05). The results of the multiple binary logistic regressions analyses are presented in Table 21.

Table 21

Multiple Binary Logistic Regression Tests for Independent Variables and ECS

	Model fitting criteria	Likelihood Ratio Tests*			Parameter Estimates (Wald Test)				
Effect	-2 Log Likelihood	χ^2 (df = 1)	Sig.	Nagelkerke R^2	*B*	*SE*	Wald	*p*	*Exp(B)*
Intercept					-2.69	.12	520.15	.000	.068
ACS	556.545	16.257	.000	.035	.044	.01	15.79	.000	1.045
RSES	569.489	3.444	.063	.008	.048	.03	3.42	.064	1.049
CBSEI	573.328	.000	.998	.000	.000	.002	.000	.998	1.000
SF-MGP	571.840	.961	.327	.002	.011	.011	.958	.328	1.011
VAS	571.989	1.339	.247	.003	.066	.057	1.323	.250	1.068
W-DEQ	566.370	6.958	.008	.015	.017	.007	6.723	.010	1.018
FSFI	571.208	.269	.604	.001	.003	.007	.266	.606	1.003
BISCS	573.197	.131	.717	.000	-.003	.007	.130	.718	.997
MSPSS	569.981	3.347	.067	.007	-.017	.009	3.453	.063	.983
AIM	565.705	1.580	.209	.003	.009	.007	1.579	.209	1.009
EPDS	567.746	.059	.808	.000	.006	.024	.059	.808	1.006
STAIY	561.626	5.398	.020	.012	.015	.006	5.511	.019	1.015
TSQM	567.635	.040	.842	.000	-.005	.024	.040	.842	.995
AGE	567.534	6.057	.014	.013	.065	.026	6.235	.013	1.067

Note. * Overall Classification Percentage is 93.6%; the cut value is .500

Multinomial logistic regression analysis was used to develop a model and to test significant determinants of ECS. Based on the direction and strength of association by the chi-square statistic as the difference in -2 log-likelihoods between the final model with the factor and with constant only, the values of Nagelkerke R^2 and Wald of the binary logistic regression, only ACS (its natural log transformation), RSE, WDEQ, MSPSS, CBSEI, and STAIY, or their subscales had p

<0.1 and were retained for the subsequent multinomial logistic regression modeling

(Table 22). Two obstetric factors that are biosocially plausible such as parity, and age

at first pregnancy and the socio-demographic factors (occupation, education level and

ethnicity were added into the multinomial logistic model to determine the effect of

each factor independently and in combination on the choice of MoD.

Table 22
Results of Multinomial Logistic Regression Analyses for Predictor Variables and ECS

MoD[a]		B	SE	Wald	df	p	Exp(B)	95% CI for Exp(B) LL	UL
VD	Intercept	26.306	5.145	26.140	1	.000			
	ACS_Ln	-4.439	1.151	14.874	1	.000	.012	.001	.113
	STAIY	-.018	.007	7.012	1	.008	.982	.968	.995
	MSPSS_FRI	.070	.026	7.197	1	.007	1.073	1.019	1.130
	WDEQ	-.014	.007	3.876	1	.049	.986	.972	1.000
	RSES	-.045	.029	2.447	1	.118	.956	.904	1.011
	OE16	.011	.005	5.857	1	.016	1.011	1.002	1.021
	AGE_PREG1	-.097	.032	9.400	1	.002	.908	.853	.966
	PARITY	-.361	.140	6.653	1	.010	.697	.530	.917
NECS	Intercept	17.635	6.011	8.605	1	.003			
	ACS_Ln	-3.673	1.356	7.340	1	.007	.025	.002	.362
	STAIY	-.001	.008	.012	1	.912	.999	.983	1.016
	MSPSS_FRI	.014	.032	.198	1	.656	1.014	.953	1.080
	WDEQ	-.017	.009	3.990	1	.046	.983	.966	1.000
	RSES	-.064	.035	3.315	1	.069	.938	.875	1.005
	OE16	.015	.006	6.142	1	.013	1.015	1.003	1.026
	AGE_PREG1	.010	.038	.064	1	.800	1.010	.938	1.087
	PARITY	-.182	.172	1.118	1	.290	.834	.595	1.168

Note. a. The reference category is: ECS.

All the required assumptions for binary logistic regressions were checked and

confirmed, including the stringent assumption that there is no linear relationship

between any continuous independent variables and the logit transformation of the

dependent variable and to identify which variables required transformation. Table

23shows that most of the interaction terms of the continuous variables and their

natural logs are not significant as *p* values are greater than .05. Furthermore, there

was no evidence of numerical problems (multicollinearity) in the model.

Table 23
Results of the Box-Tidwell (1962) Procedure for Linearity Test

	B	*SE*	Wald	*Df*	*p*	*Exp(B)*	95% CIfor *EXP(B)*	
							LL	UL
ACS by ACS_Ln	.007	.002	8.950	1	.003	1.007	1.002	1.011
RSES by RSES_Ln	.009	.008	1.336	1	.248	1.009	.994	1.024
CBSEI by CBSEI_Ln	-.001	.000	1.563	1	.211	.999	.999	1.000
SFMGP by SFMGP_Ln	.001	.003	.041	1	.839	1.001	.994	1.007
VAS by VAS_Ln	.026	.024	1.195	1	.274	1.026	.980	1.076
WDEQ by WDEQ_Ln	.004	.001	6.808	1	.009	1.004	1.001	1.007
FSFI by FSFI_Ln	.001	.002	.204	1	.651	1.001	.998	1.004
BISCS by BISCS_Ln	-.002	.002	.787	1	.375	.998	.994	1.002
MSPSS by MSPSS_Ln	-.004	.002	4.154	1	.042	.996	.991	1.000
AIM by AIM_Ln	.002	.001	1.154	1	.283	1.002	.999	1.005
EPDS by EPDS_Ln	-.005	.008	.387	1	.534	.995	.979	1.011
STAIY by STAIY_Ln	.002	.001	2.349	1	.125	1.002	.999	1.005
TSQM by TSQM_Ln	-.001	.006	.026	1	.871	.999	.986	1.012
Constant	-7.644	1.518	25.355	1	.000	.000		

Based on the test results for binomial logistic regression assumption for

linearity in Table 23, ACS, WDEQ, and MSPSS variables were log transformed

before they were entered into the model.The overall effect of the combination of

psychosocial factors on the likelihood of participants having ECS was statistically

significant, χ^2(df = 19), = 77.735, p <.001). The model explained 17.0% (Nagelkerke

R^2 = .170) of the variance in MoD and correctly classified 93.4% of the cases.

Table 24

The Results of Binomial Logistic Regression Model for ECS

			Variables in the Equation					
ECS[a]	*B*	*SE*	Wald	*Df*	*p*	*Exp(B)*	95% CI for EXP(B)	
							LL	UL
ACS_Ln	4.327	1.159	13.945	1	.000	75.711	7.814	733.553
RSES	.051	.029	3.098	1	.078	1.053	.994	1.115
OE16	-.012	.005	5.882	1	.015	.988	.979	.998
WDEQ_Ln	.924	.461	4.020	1	.045	2.520	1.021	6.221
MSPSSFri_Ln	-.858	.432	3.956	1	.047	.424	.182	.988
STAIY	.018	.007	6.276	1	.012	1.018	1.004	1.032
AGE_PREG1	.080	.034	5.545	1	.019	1.083	1.013	1.158
PAROUS			6.570	2	.037			
PAROUS(1)	-1.277	.515	6.140	1	.013	.279	.102	.766
PAROUS(2)	-.381	.270	1.982	1	.159	.683	.402	1.161
ETHNIC			9.220	4	.056			
ETHNIC(1)	1.497	.622	5.802	1	.016	4.469	1.322	15.114
ETHNIC(2)	1.121	.713	2.470	1	.116	3.068	.758	12.418
ETHNIC(3)	1.697	.698	5.909	1	.015	5.455	1.389	21.422
ETHNIC(4)	.789	.721	1.197	1	.274	2.201	.536	9.044
EDUC_Level			5.324	3	.150			
EDUC_Level(1)	-.464	.439	1.117	1	.291	.629	.266	1.486
EDUC_Level(2)	.269	.317	.721	1	.396	1.309	.703	2.436
EDUC_Level(3)	-.580	.583	.989	1	.320	.560	.179	1.755
OCCUPATION			2.653	3	.448			
OCCUPATION(1)	.151	.425	.126	1	.722	1.163	.506	2.673
OCCUPATION(2)	.291	.592	.242	1	.623	1.338	.419	4.268
OCCUPATION(3)	.520	.390	1.775	1	.183	1.682	.783	3.615
Constant	-28.119	5.784	23.637	1	.000	.000		

Note. a. Variable(s) entered on step 1: ACS_Ln, RSES, OE16, WDEQ_Ln, MSPSSFri_Ln, STAIY,

AGE_PREG1, PAROUS, ETHNIC, EDUC_Level, OCCUPATION. The reference category is: Elective

Cesarean section.

The Wald test showed that ACS, MSPSS (Fri), WDEQ, CBSEI (OE-16), STAIY, age at first pregnancy and parity, among the set of predictors (Table 24), were helpful in distinguishing between the choice for ECS and VD

The reduced model, considering only the statistically significant predictors is:

$$\textbf{Pr(ECS)} = \boldsymbol{\alpha} + \boldsymbol{\beta_1 x_1} + \boldsymbol{\beta_2 x_2} + \boldsymbol{\beta_3 x_3} ... + \boldsymbol{\beta_i x_i}$$

Pr(*ECS*) = -28.119+4.327*ACS*+.018*STAIY*+.924*WDEQ*+.080*AGEPREG1*-.858*MSPSSFri*-.012*OE16*+....

From the model the β coefficients mean for instance, that for every one percent increase in autonomy connectedness scale (ACS), the probability of a woman opting for ECS increases by 4.3%; and for a one percent increase in WDEQ, the probability of ECS increases by 0.9%. For every unit increase in STAIY (pregnancy related anxiety) and in WDEQ, we expect a 0.018% increase in the probability of ECS. Age at first pregnancy and parity were also significant predictors of ECS. A woman who has had her first live vaginal birth (primiparous) has a 72.1% reduced likelihood of ECS than a nulliparous woman; and for every year of increase in age at first pregnancy, we expect 0.08% increase in the likelihood of opting for ECS holding all other predictors constant.

The negative β values for MSPSS_Fri and OE16 which are subscales of psychosocial measures indicate a reverse relationship, thus, a women who had a lower perceived social support from friends and who had a lower expectancy (self-efficacy) for birth outcome were more likely to choose ECS. For every one percent increase in MSPSS_Fri (Exp *β* =.424) and for every unit increase in OE16 (Exp *β* =

.988), there was a corresponding decrease in odds of ECS by 57.6% and 1.2% respectively.

Summary and Transition

In this chapter the results of the different statistical tests for the hypothesized predictors of elective cesarean section deliveries were presented. In conclusion, the statistical analyses of the study data supported hypothesis 1 but held the null for hypothesis 2. Overall CS rates are lower than 15% but ECS rates are higher than 5% in the study hospitals. Data also supported most of the hypotheses 3a through 3g. Significant associations were found between MoD and a woman's autonomy (ACS), fear of birth (WDEQ), perceived social support from friends (PSS-Fri), and pregnancy related anxiety (STAIY). However, the distribution of scores for measures of pain (SFMGP and VAS), sexual function (FSFI and BISCS), and social convenience (TSQM) were equal across the categories of MoD. The logistic regression analyses test for hypothesis 4 found ACS, WDEQ, STAIY, PSS-Fri, outcome expectancy for birth (OE16) as significant predictors of ECS.

The following chapter 5 will discuss these findings; summarize the study and present conclusions about the findings. The chapter will also discuss the social change implications of the findings, the limitations of this study, and future recommendations for future research in this scholarly field.

Chapter 5: Discussion

Introduction

This quantitative study was conducted to determine the nature of the

relationship between psychosocial indicators and MoD. Specifically, the research

targeted women in their third trimester attending prenatal services in two of the

biggest maternity hospitals in Nairobi and investigated to what extent and which

psychosocial behaviors predicted a woman's choice for a caesarean section or a

spontaneous vaginal birth. Secular trends have seen a surging increase in the

incidence of cesarean section deliveries, a significant proportion of which are driven

by women's choice and demand for cesarean surgical services for many reasons.

Pregnancy and childbirth are not just health outcomes but important social events and

the decision for elective cesarean section is influenced by a complex interaction of the

woman's psychological status and the social environment. Since psychosocial factors

play a role in the increasing incidence ECS, it is of public health importance to

identify and quantify these factors to the benefit of healthcare providers and expectant

women in obstetric counseling during pre-natal clinic sessions.

Summary and Interpretation of Findings

A critical review by McCourt et al. (2007) had pointed increased interest in

women's demand for deliveries by cesarean section over the last decade (Lin and

Xirasagar, 2005) while noting that a few number of studies focused on cesarean

sections in the absence of justifiable clinical indications. As the literature review

revealed, the women's choice for elective cesarean section related to personal

psychological and social factors such as autonomy, self-control, perceptions of safety, fear of child birth, sexuality, and perceived quality of obstetric care (McCourt et al., 2007), and gaps were identified in understanding the combined influence of the several psychological and social factors on elective cesarean section decisions. In the current study, expectant women without history of cesarean section were prospectively evaluated on their psychosocial reasons regarding their preferred MoD. It was expected that the participants who reported preference for cesarean section in their pregnancy and actually underwent cesarean section delivery would also report higher levels of personality traits, perceived labor pain, fear of child birth, sexual functionality, social support, emotional status and social convenience.

The findings of this study demonstrate that participants who reported higher levels of autonomy connectedness, delivery expectancy, and anxiety regarding childbirth also reported higher elective cesarean section outcome. However, levels of perceived social support regarding pregnancy and delivery were lower among participants of elective cesarean section category than among the vaginal delivery category, indicating an inverse relationship. Additionally, the participant's autonomy, Wijma delivery expectancy, anxiety, perceived support from friends and, outcome expectancy for birth whereas significant predictors of elective cesarean section delivery. The current research supports the theoretical social ecologic model and the theory of planned behavior by explaining the interaction of multiple intrapersonal psychosocial factors with social and obstetric behaviors to predict the outcome of elective cesarean section deliveries.

Psychosocial Factors Associated with ECS Deliveries

Personality Traits and ECS

A review by Thomas (2010) suggested that personality traits can influence the outcome of childbirth and MoD including their attitude to pregnancy and request for cesarean section (Wiklund et al., 2006), autonomy or desire to maintain self-control for choice of delivery (Pang et al., 2007; Munro et al.,2009), or self-esteem (Nerum, Halvorsen, Sørlie and Oian, 2006). Hypothesis 3a examined the association between a woman's personality traits (autonomy, self-control and self-esteem), and the outcome of ECS. There was a significant positive relationship between a woman's autonomy and ECS. Higher levels of autonomy in women were reported among the delivery category of elective cesarean section.

The hypothesis that ECS is significantly associated to a woman's personality traits was supported. The null hypotheses that the median scores of ACS and RSE are the same across the categories of participants who performed ECS and those who did not were rejected at .05 level of significance. The woman's autonomy connectedness scale was particularly important in distinguishing the ECS and the VD groups. The higher the level of woman's self-awareness, capacity for managing new situations, sensitivity to others, and occupational self-efficacy, the more likelihood of undergoing elective cesarean section. The study however did not find significant association between self-esteem during pregnancy as measured by RSE and elective cesarean section and so its predictive role for MoD was not supported. Although recent studies (O'Reilly, Choby, Séjourné, & Callahan, 2014) have found an inverse

association between planned or emergency caesarean with post-partum maternal self-esteem, this study does not support the contribution of pre-partum self-esteem in determining the MoD. As Loto et al. (2009) had earlier found women with CS having lower scores on the self-esteem scale than women with spontaneous vaginal delivery in Nigeria, the findings of this study suggest self-esteem could be an effect rather than determinant of cesarean section delivery.

Female Sexual Functionality and ECS

Several studies have associated reduced sexual functioning or activity after surgical vaginal delivery especially if it involves surgical incarcerations (Brubaker et al., 2008) or causes perineal injury (Radestad, Olsson, Nissen, & Rubertsson, 2008) and so hypothesis 3b had suggested that some of the women would consider ECS to preserve their sexual function or to avoid decline in sexual satisfaction after delivery (Baksu et al., 2007), especially if they had a prenatal sexual dysfunction. The hypothesis that there is an association between ECS and a woman's sexual function, as measured by the BISCS and FSFI, was not supported. The null hypothesis that the distribution of FSFI and BISCS is the same across the categories of modes of delivery was retained in this study. Furthermore, only one percent of the participants who had preferred cesarean section delivery had given preservation of sexual function as their main reason for the choice. The findings of no significant association are yet consistent with some other studies that suggest associations between postnatal sexual function and MoD are mere perceptions related to culture (Klein et al., 2009; Khajehei et al., 2009). Recent studies also failed to find evidence that ECS is

preferred to VD in regard to preserving sexual functioning (Hosseini, Iran-Pour, & Safarinejad, 2012; Yeniel and Petri, 2014).

Tocophobia and ECS

The null hypothesis that the distribution of Wijma Delivery Expectancy-Experience Score, a measure of the level of fear of childbirth (tocophobia), is the same across categories of elective cesarean section deliveries was rejected. Therefore, the study found a significant association between ECS and a woman's fear of childbirth. Many studies in the past have similarly found significant association between tocophobia and elective cesarean section (Munro, Kornelson, & Hutton, 2009; Tschudin et al., 2009; Buyukbayrak et al., 2010) mainly due to the anticipated painful experience of labor (Serçekuş and Okumuş, 2007); heinous cultural stories and past experience of child birth (Pang et al., 2008; Munro et al, 2009), lack of confidence in the birth attendants (Serçekuş and Okumuş, 2007) and perceived risks to the baby (Robson et al, 2008). It is notable that 61% the interviewed participants who had indicated preference for cesarean section ($n = 288$) had mentioned concern for the safety of child or self as the main reason for their choice.

The findings of this study are consistent with recent studies that continue to report higher proportions of cesarean delivery among the women with fear of childbirth compared to women with low WDEQ scores (Sydsjö, G., Sydsjö, A., Gunnervik, Bladh, & Josefsson, 2012; Nilsson, Lundgren, Karlström, & Hildingsson, 2012). The higher the severity of tocophobia (WDEQ scores), the higher the likelihood of selecting ECS compared to the less fearful women. In their screening in

a randomized control trial, Rouhe et al. (2013) recently found about 8% of the

screened nulliparous women had severe fear for childbirth (WDEQ scores>100) and

more likely to select cesarean section.

Perceived Labor Pain and ECS

Labor pain is suggested to be one of the stressful episodes in childbirth (Lally

et al., 2008) and as significant associations with ECS have been reported in previous

studies (Eriksson, Westman, & Hamberg, 2006; Waldenström et al., 2006; and

Weaver et al., 2007), the study had suggested that participants with higher levels of

perceived labor pain would opt for cesarean section to avoid this experience. The

null hypothesis that the distribution of VAS and SF-MPQ scores is the same across

categories of elective cesarean section was retained. The study findings did not

support the hypothesis that ECS is significantly associated with perceived labor pain

as assessed by the VAS and SF-MPQ.

Some authors have suggested that the tendency of avoiding labor pain has an

intricate linkage not just with fear (Abushaikha & Sheil, 2006; Faisal, Matinnia,

Hejar, & Khodakarami, 2014) but also with bad experience from previous births

(Nilsson & Lundgren, 2009) and pregnancy related stress (Barragán, Solà, & Juandó,

2011; Simkin, 2011) and lack of confidence (Lyndon, Zlatnik, & Wachter, 2011;

Toohill, et al., 2014). In this study, significant associations were observed in fear of

childbirth, but not perceived labor pain. It is also worth noting that with the

introduction of anesthetics in obstetrics, significant progress has been made in

management of labor pain (Kolip & Buchter, 2009; Hawkins, 2010) and so the

differential level of pain experienced during both vaginal and cesarean deliveries has reduced.

Perceived Social Support and ECS

Research has shown that women who receive social support in pregnancy and during labor have lower rates of cesarean sections (Hodnett, Gates, Hofmeyr, Sakala, & Weston, 2012, Deng, Wei, et al., 2014) and although few studies have concentrated on the effects of social networks on the MoD decisions (Kohler, Behrman, & Watkins, 2007), this study suggested a relationship between perceived social support and ECS outcome. The study findings supported the hypothesis of significant association between ECS and perceived social support as measured by the MSPSS, and specifically perceived support from friends but not support from family or significant others. Customarily, women are attended to and expect social support from other women friends or relatives to give them the confidence to face labor and childbirth and as Honett et al. (2014) explains, as women now give birth in hospitals, they expect continuous social support during labor in terms of emotional motivation, comfort and information.

Pregnancy Related Emotional Status and ECS

The emotional status of the woman during pregnancy and delivery is suggested to be associated with interpretation, expectations and decisions concerning the delivery process. As previous studies have shown, pregnancy related depression, stress or anxiety may contribute to lessened confidence, fear and dissatisfaction with the birthing process (Ip & Martin, 2008), which can encourage a woman to opt for

cesarean section. The hypothesis that there a significant association between ECS and a woman's pregnancy-related emotional health status as measured by state-trait anxiety scale for adults was supported. In this study, ECS decisions are therefore associated with the woman's pregnancy related anxiety levels and neither with pregnancy related stress nor depression.

Anxiety about own health and that of the unborn baby (Wiklund et al.,2007) or too high expectation about the birth outcome (Lally et al., 2008) is suggested to be associated with elective cesarean section deliveries and is consistent with findings of this study. The level of perceived labor pain and tocophobia is thought to be associated with elevated levels of stress hormones during pregnancy and delivery (Gunning, 2008) and depression in pregnancy is likely to result into blurred perception of the stressful and painful birthing process, thus stimulating intensions for elective cesarean section or avoidance of the vaginal birth process (Ip & Martin, 2008). However, the most studied is postpartum depression as an outcome with some studies reporting significant association with MoD and negative birth outcomes (Davalos, Yadon, & Tregellas, 2012; Rouhe et al., 2011) and others finding no difference between the vaginal and cesarean deliveries (Carter, Frampton, &Mulder, 2006; Lobel, &DeLuca, 2007; Sword et al., 2011). In similarity with some of these studies, the association between ECS and EPDS (depression) in this study was not supported.

Social Convenience and ECS

As studies elsewhere in Australia and Turkey have suggested women may opt

for cesarean section delivery because it is convenient to plan for the period (well early

before the onset of delivery) [ACOG, 2007], time of the day or night (Kassak, Ali, &

Abdallah, 2005), or period of the week (weekends) that meet both need of the

obstetrician's and the woman's schedules (Gezer, Sximsek, & Altinok, 2007). In this

study, the null hypothesis that the distribution of convenience scale for delivery

services is the same across categories of elective cesarean section delivery was

upheld. The findings do not support association between ECS decisions and the

woman's satisfaction with ease of planning the day of delivery, time of delivery,

maternity leave and work schedule, length of delivery process, and availability of the

delivery services. This practice would be more common in private services where

women mostly in formal employment, have more flexibility and financial strength to

schedule delivery. In this study only 16.1% of the participants were formally

employed and only 16 (1.3%) women delivered in the private facility. Furthermore

only 21 (7.3%) of the 288 participants who had expressed cesarean section in

preference to vaginal birth indicated social convenience as their main reason.

Psychosocial Model for ECS Deliveries

The combination of psychosocial factors had a significant effect on the

probability of participants having ECS (p <.001) with five of the ten measures of

psychosocial state – ACS (p <.001), MSPSS-Fri (p = .047), WDEQ (p = .045),

CBSEI-OE16 (p = .015), and STAIY (p = .012) contributing significantly to the

predictive model. However, the model has moderate predictive capacity, explaining only 17.0% of the variance in MoD indicating that there are other non psychosocial factors that majorly contribute to elective cesarean section deliveries and were not part of this study. Furthermore this study found significant predictive role of obstetric factors - age at first pregnancy ($p = .019$) and parity ($p = .037$) in the ECS delivery outcome. Similar studies have found delayed childbirth (Smith et al., 2008) and parity (Rao, Celik, Poggi, Poon, & Nicolaides, 2008; Al Rowaily, Alsalem, & Abolfotouh, 2014) as a significant predictor of elective cesarean sections. Although our search did not identify any study that has focused on the combined effect and interaction of all these psychosocial factors in a multiple regression model, a few other studies have also found autonomy, self-efficacy (Fuglenes, Aas, Botten, Øian, & Kristiansen, 2011; Nilstun, Habiba, Lingman, Saracci, Da Frè, & Cuttini, 2008; Walsh, 2008), social support (Essex & Pickett, 2008; Leone, Padmadas, & Matthews, Z. 2008), tocophobia (Nieminen, Stephansson, & Ryding, 2009) and anxiety as individual predictors of ECS.

The psychosocial logistic regression model synchronizes well with the conceptual framework used in the design of this study and supports the theoretical models of SEM and TPB adopted to analyze the psychosocial predictors of ECS taking into account the combination of these multiple factors of personal traits, psychological state, sexual behaviors, and social interactions at different levels (personal, institutional and societal) [Cottrel et al., 2009] to explain ECS as a delivery outcome. As Ajzen (2012) asserts, this decision is not completely volitional since

many other external (non-personal) factors are at play. Personal traits such as autonomy, self-efficacy or confidence; psychosocial status such as anxiety and fear of childbirth or labor pain interact in the social environment of expectant social support from friends among other factors to influence a woman's preference for cesarean section.

Implications of Findings for Social Change

Implications for social change stem from the finding that a woman's personal autonomy (self-awareness capability, capacity to adapt and manage new situations, sensitivity to others, and occupational self-efficacy), fear and anxiety related to child birth experiences or expectations and the level of social support expected or provided by friends interact with the woman's obstetric factors – parity and age at first pregnancy to predict whether she is likely to undergo a cesarean section or not in the two national hospitals in Nairobi.

The findings will contribute to the raging debate on screening potential CS cases and designing pre-natal counseling package to address these psychosocial factors to control cesarean rates (Robson, Hartigan, & Murphy, 2013). The findings also confirm that some cesarean sections can be avoided if women's preferences, fears and expectations were elicited early in pregnancy to allow for more sensitive/individualized care. The results thus have implications on finding ways to reduce fear of child birth, expectations for negative birth outcomes and improving support from friends during pregnancy and child birth. In a recent randomized study for instance, Rouhe et al. (2013) showed a favourable effect of psycho-educative

group therapy for the treatment of nulliparous women fearful of childbirth with women who received the treatment reporting significantly more spontaneous vaginal delivery and satisfaction with their delivery than those who did not. Hodnett et al. (2012) have further recommended continuous support (including emotional, informational, and advocacy support) for women during childbirth by other women (friends or relatives); compared to routine care, women allocated to continuous individualized intrapartum support are less likely to have a cesarean section or birthing dissatisfaction than spontaneous vaginal birth. In some of the neighboring countries in the region such as Zimbabwe, Tanzania and South Africa, Better Births policy initiatives have been put in place to promote companionship during labor as a core element of obstetric care in hospitals to improve maternal and infant health (Hodnett et al., 2012).

Limitations of the Study

The study was conducted among women attending prenatal services in two public government hospital/maternity facilities in Nairobi coming from different city residential settlements. Although one of the facilities – Kenyatta National Hospital has both public and private wings, it turned out that even the private wing derives its clients from the public pre-natal clinic and only a minor proportion (3.2%) of the participants ended up delivering at the private services. The study findings are thus only limited to those using health facilities in the city's two public national hospitals and not private hospitals, where ECS rates are expected to be higher (Villar et al., 2006).

Inherent in the design of this study (prospective cohort) is that the study can only identify predictive factors associated with the postulated delivery outcome and because complete randomization is not possible caution should be exercised when drawing conclusions about the results. Although participants came across the city settlements/estates, some selection bias may have resulted from misclassification and loss to follow-up of participants. The continuum of indications for of emergency and elective CS decisions is rather arbitrary since in the obstetrical ward set-up these categories are not so detached and usually obstetric records would not indicate the cesarean section was at the woman's request. A case of ECS was defined as those that had indicated preference or intention for ECS and ended up undergoing a cesarean birth. There is no evidence these intensions were communicated by the clients to the obstetricians and thus there is a possibility some of the identified psychosocial predictors of ECS also contributed to development of medical indications for emergency cesarean section deliveries. Participants were followed post-partum at the antenatal clinic and or by phone calls with at least three calls made at different times of the day, if unanswered before being dropped. Restricting the study to participants without a history of cesarean section and/or known medical risks removed the confounding effect women opting for a repeat cesarean section or as a result of medical indications.

Certain limitations were observed with the tools used in the study especially unidimensional self-reported scales. The RSE, though a valid and reliable measure of global self-esteem - the degree to which one values oneself, its structural limitations

dependent on age and occupation may have limited its role in discriminating between the ECS and VB groups. Unidimensional self-report scales such as VAS, RSE are susceptibility to social desirability bias (Mullen, Gothe, & McAuley, 2013) and in such a study population with 84% in non-formal occupation respondents are likely to obtain skewed and favorable responses that overestimate self-esteem. In this study the mean RSE score was 20.2 out of maximum score of 30. One major limitation noted with the SF-MPQ was the rich terminology required of respondents to complete the questionnaire (Hawker, Mian, Kendzerska, & French, 2011). Participants in this study often called for assistance in distinguishing between the different sensory pain descriptors such as throbbing, stabbing, shooting, gnawing, and splitting. There is, however, no evidence this problem skewed the findings in any group.

Conclusion

In conclusion, our study shows that the CS rates including ECS deliveries in the public hospitals are still within the technologically driven levels, although rates in private hospitals are likely to be much higher. The identified model that includes connectedness, social support, anxiety and fear of child birth may be used to predict the probability of a woman undergoing a cesarean section given the parity and age at first pregnancy.

Recommendations for Future Studies and Actions

The findings emphasize the need for considering the psychosocial status of the woman in prenatal lessons and providing unbiased information on the benefits and risks of both cesarean section and spontaneous vaginal delivery. A subject of future

study is to see whether these predictive factors can be validated with clients in private hospital setting and whether women's initial intention for CS delivery play a role in conditions for emergency cesarean section delivery. The study recommends randomized controlled trials of intention to perform cesarean section to give more evidence regarding ECS at term. This is important, since reliable psychosocial models that predict ECS would be useful in clinical practice. Firstly, women identified with favorable prognosis for cesarean section, could be counseled to build their confidence, address their fears and inform their expectations on the birth outcomes. Secondly, the physician may postpone induction of labor for women with high probability of undergoing emergency cesarean section, and ECS planned for in good time.

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Appendix A: Consent Form

You are invited to take part in a research study of the *factors that contribute to women's decision to go for cesarean section deliveries that are not medically indicated*. The researcher is inviting expectant adult women (18-49 years old) who are in their 3rd trimester (within 3 months to delivery), attending antenatal clinic and booked to deliver in this hospital, and who can read and write, to be in the study. This form is part of a process called "informed consent" to allow you to understand this study before deciding whether to take part.

This study is being conducted by a researcher named **Tom Oguta**, who is a doctoral student of public health.

Background Information:

The purpose of this study is to examine the psychosocial factors that determine women's choice of mode of delivery and how strong these factors predict whether a woman would request to undergo a cesarean section operation or not.

Method/procedure:

If you agree to be in this study, you will be asked to:
- take a 45- minute interview by responding to a structured questionnaire that is composed of ten psychosocial scales in one of your antenatal visits before delivery
- provide information on your actual mode of delivery on your 6th week postnatal visit

The research team is composed of the following persons:
- Tom Oguta – the Principal investigator
- Prof. Koigi Kamau – Local Supervisor, University of Nairobi
- Prof. Cassandra Arroyo – Committee Chair/ Supervisor, Walden University
- Dr. Rodney Lemery – Committee member /Supervisor, Walden University

Voluntary Nature of the Study:

This study is voluntary. Everyone will respect your decision of whether or not you choose to be in the study. No one at **Kenyatta National Hospital/Pumwani Maternity Hospital** will treat you differently if you decide not to be in the study. If you decide to join the study now, you can still change your mind later. You may stop at any time.

Risks and Benefits of Being in the Study:

Being in this type of study involves some risk of the minor discomforts that can be encountered in daily life, such as fatigue or becoming upset about the additional time

sacrificed answering the interview that will take about one hour; disclosure of confidential information such as educational, obstetric and medical records; and responding to questions on sexual function and social support that touches on the partner relationships. Being in this study would not pose risk to your safety or wellbeing. By participating in this study, you will have the opportunity to have increased social contact and sharing your experience with the research team, obtain referral for further obstetric counseling if needed, and learn more by asking questions about the topic of cesarean section.

Compensation:

A reimbursement of Kenya Shillings 300 (≈ USD $3.5) will be given to all participants who take the interview as transport compensation or airtime voucher after the interview session. No other payment, thank you gifts, or reimbursements will be provided to participants for their participation in the study.

Privacy:

Any information you provide will be kept confidential. The researcher will not use your personal information for any purposes outside of this research project. Also, the researcher will not include your name or anything else that could identify you in the study reports. Data will be kept secure by stripping any personal profile information such as name or contact details from the data file, keeping the data in a password protected PC with password authorized only for the researcher, and ensuring data back-up in encrypted USB and CD. The questionnaires and back-up data will be kept in a safe lock in the researcher's study room for a period of at least 5 years, as required by the university.

Contacts and Questions:

You may ask any questions you have now. Or if you have questions later, you may contact the researcher via telephone number: **0722 392499** and/or email address: tom.oguta@waldenu.edu. If you want to talk privately about your rights as a participant, you can email or call Prof. M.L. Chindia, the Secretary KNH/UoN ERC on uonknh_erc@uonbi.ac.ke; Tel: +254-020-2726300, extension 44355. The Ethics Research Review Committee's (ERRC) approval number for this study is **P507/10/2013** and it expires on **February 17, 2015.**

The researcher will give you a copy of this form to keep.

Statement of Consent:

I have read the above information and I feel I understand the study well enough to make a decision about my involvement. By signing below,   I understand that I am agreeing to the terms described above.

Printed Name of Participant:

Date of consent:

Participant's Signature:

Researcher's Signature:

Appendix B: Confidentiality Agreement

Name of Research Assistant: _____

During the course of my activity in collecting data for this research: *"Psychosocial Determinants of Elective Cesarean Section Deliveries in Nairobi, Kenya."* I will have access to information, which is confidential and should not be disclosed. I acknowledge that the information must remain confidential, and that improper disclosure of confidential information can be damaging to the participant.

By signing this Confidentiality Agreement I acknowledge and agree that:

1. I will not disclose or discuss any confidential information with others, including friends or family.
2. I will not in any way divulge, copy, release, sell, loan, alter or destroy any confidential information except as properly authorized.
3. I will not discuss confidential information where others can overhear the conversation. I understand that it is not acceptable to discuss confidential information even if the participant's name is not used.
4. I will not make any unauthorized transmissions, inquiries, modification or purging of confidential information.
5. I agree that my obligations under this agreement will continue after termination of the job that I will perform.
6. I understand that violation of this agreement will have legal implications.
7. I will only access or use systems or devices I'm officially authorized to access and I will not demonstrate the operation or function of systems or devices to unauthorized individuals.

Signing this document, I acknowledge that I have read the agreement and I agree to comply with all the terms and conditions stated above.

Signature: _____   **Date:** _____

Appendix C: Letter of Invitation to Participate in Research

April 11, 2014

Title of Study: Psychosocial Determinants of Elective Cesarean Section Deliveries in Selected Obstetric Facilities in Nairobi, Kenya

Principal Investigator: Tom Joseph Oguta, PhD Candidate, Walden University, USA.

Supervisors: Dr. Rodney Lemery - Committee Chair, Walden University.

Dr. Aaron Mendelsohn – Committee Member, Walden University.

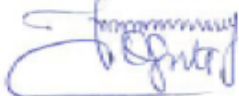Prof. Koigi Kamau   – Local Supervisor, University of Nairobi.

I, <u>Tom Joseph Oguta</u>, PhD student from the Department of Public Health, College of Health Sciences, Walden University, invite you to participate in a research project entitled Psychosocial Determinants of Elective Cesarean Section Deliveries in two Selected Obstetric Facilities in Nairobi, Kenya.

The purpose of this research project is to examine non-medical factors that determine women's choice of mode of delivery and how strong these factors predict whether a woman would request to undergo a cesarean section operation or not. Should you choose to participate, you will be asked to take an interview by responding to a questionnaire that is composed of ten psychosocial scales in one of your antenatal visits before delivery and provide information on your actual mode of delivery on your 6th week postnatal visit. The expected duration of the interview is 1 hour.

Being in this study would not pose risk to your safety or wellbeing. By participating in this study, you will have opportunityto share your experience with the research team, obtain referral for further obstetric counseling if needed, and learn more by asking questions about the topic of cesarean section.

If you have any pertinent questions about your rights as a research participant, please contact Dr. Leilani Endicott on leilani.endicott@waldenu.edu or is Tel: 1-800-925-3368, extension 1210. If you have any other questions, please feel free to contact mevia telephone number: **0722 392499** and/or email address: tom.oguta@waldenu.edu or any of the research team on the following contacts.

Thank you,

…………………………………

Tom J. Oguta
P.O. Box 1230 00621, Nairobi.

Appendix D: Screening Form

1. Date of Screening: __/__/ ___   Health Facility: ____   Type of services: 1 = Public 2 = Private

Instructions

The form is set up in two (2) sections. Please answer all questions in both sections by **STRIKING/CIRCLING** the response you find most appropriate.

A: Personal profile

1.   Record the following information about the Respondent

   a) First Name: _____   b) Residence (estate): _____   c) Telephone No.
       Jina la kwanza   *Makao*   __
                                                                             Nambari ya simu:

2.   How old are you (yrs)? _____
     Una umri gani?
3.   How many years have you been to school? ___   0 = No formal education;
     Umesoma shuleni mpaka darasa la ngapi?   1 = Primary 2 = Secondary; 3 =
                                                      Technical/Polytechnic; 4 = College/University

B: Obstetric Profile:

4. Have you had a pregnancy before? ___ 0 = No 1 = Yes   5. What was your age at first pregnancy?
   Umekuwa mjamzito awali?   ____
                                                              Ulikuwa na umri gani katika mimba wa kwanza?

6. How many live births have you had? _____
   Idadi ya watoto uliowazaliwa hai?

7. How did you deliver your previous pregnancy?   1 = Normal; 2 = With complications; 3 = Cesarean
    Jinzi gani uliofungua mimba ya awali?   section; 4 = Miscarriage; 9 = N/A

8.   How many weeks is your current pregnancy? _____   9.   Have you been checking this pregnancy
     Ujauzito huo umepita wiki ngapi?   regularly?
                                                              0 = No   1 = Yes
                                                              Ujauzito huo umepima kwa kawaida?

10.   What do you remember from previous birth that will influence how you think and feel during this
      delivery?
      Unakumbuka nini toka ulipojifungua, je hii itakuathiri vipi utakapojifungua mara hii?

      ----

11. If you had uncomplicated pregnancy and had the choice to   1 = Vaginal birth;
     schedule for a cesarean or to wait for spontaneous vaginal birth,   2 = Cesarean section
     which one would you choose? _____   3 = Undecided/Don't
     Kama ungelikuwa na mimba rahisi na ungelikuwa na uchaguzi wa know

ratiba kwa upasuaji au kusubiri kwa hiari kuzaliwa uke, ni gani moja ungeweza kuchagua?

12. What would be your main reason for choosing this mode of delivery?
Nini itakuwa sababu yako kuu kwa ajili ya kuchagua aina hii ya kujifungua?
1 = It is the norm (stylish);   2 = Safety of child/mother;   3 = Pain avoidance;   4 = Fear of childbirth;   5 = Sexual function;   6 = Convenience; 7 = Cost of delivery;   8 = Post-partum recovery;   8 = Peer's influence;   9 = Spouse's preference

Appendix E: Letter of Ethical Review Approval – KNH/UoN

UNIVERSITY OF NAIROBI
COLLEGE OF HEALTH SCIENCES
P O BOX 19676 Code 00202
Telegrams: varsity
(254-020) 2726300 Ext 44355

KNH/UON-ERC
Email: uonknh_erc@uonbi.ac.ke
Website: www.uonbi.ac.ke

KENYATTA NATIONAL HOSPITAL
P O BOX 20723 Code 00202
Tel: 726300-9
Fax: 725272
Telegrams: MEDSUP, Nairobi

Ref: KNH-ERC/A/38   Link:www.uonbi.ac.ke/activities/KNHUoN   18th February 2014

Tom Joseph Oguta
Walden University
P O BOX 1230-00621
NAIROBI
Email:tom.oguta@waldenu.edu

Dear Tom

RESEARCH PROPOSAL: PSYCHOSOCIAL DETERMINANTS OF ELECTIVE CESAREAN SECTION DELIVERIES IN SELECTED OBSTETRIC FACILITIES IN NAIROBI, KENYA (P507/10/2013)

This is to inform you that the KNH/UoN-Ethics & Research Committee (KNH/UoN-ERC) has reviewed and **approved** your above proposal. The approval periods are 18th February 2014 to 17th February 2015.

This approval is subject to compliance with the following requirements:

a) Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
b) All changes (amendments, deviations, violations etc) are submitted for review and approval by KNH/UoN ERC before implementation.
c) Death and life threatening problems and severe adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH/UoN ERC within 72 hours of notification.
d) Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH/UoN ERC within 72 hours.
e) Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. (*Attach a comprehensive progress report to support the renewal*).
f) Clearance for export of biological specimens must be obtained from KNH/UoN-Ethics & Research Committee for each batch of shipment.
g) Submission of an *executive summary* report within 90 days upon completion of the study
   This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/or plagiarism.

For more details consult the KNH/UoN ERC website **www.uonbi.ac.ke/activities/KNHUoN.**

Yours sincerely

PROF. M.L. CHINDIA
SECRETARY, KNH/UON-ERC

c.c.   The Deputy Director CS, KNH
        The Principal, College of Health Sciences, UoN
        Assistant Director/Health Information, KNH
        Supervisors: Cassandra Arroyo, Walden University
                     Rodney Lemery, Walden University
                     Prof. Koigi Kamau, Dept.of Obs/Gynae, UoN

Appendix F: Data Use Agreement with KNH

DATA USE AGREEMENT

This Data Use Agreement, effective as of ⬚ 09/04/2014 ⬚, is entered into by and between ⬚ Tom Jospeh Oguta ⬚ ("Data Recipient") and ⬚ Kenyatta National Hospital ⬚ ("Data Provider"). The purpose of this Agreement is to provide Data Recipient with access to a Limited Data Set ("LDS") for use in research in accord with the HIPAA and Kenyatta National Hospital/University of Nairobi Ethics and Research Review Committee (KNH/UON-ERRC) Regulations.

1. Definitions. Unless otherwise specified in this Agreement, all capitalized terms used in this Agreement not otherwise defined have the meaning established for purposes of the "HIPAA Regulations" codified at Title 45 parts 160 through 164 of the United States Code of Federal Regulations, as amended from time to time.

2. Preparation of the LDS. Data Provider shall prepare and furnish to Data Recipient a LDS in accord with any applicable HIPAA or FERPA Regulations

3. Data Fields in the LDS. No direct identifiers such as names may be included in the Limited Data Set (LDS). In preparing the LDS, Data Provider shall include the **data fields specified as follows**, which are the minimum necessary to accomplish the research (list all data to be provided): Participants age, education, occupation, marital status; obstetric record (previous cesarean section, surgical vaginal delivery, multiple births, such as breech presentation, distress, dystocia or other birth complications/outcomes or experiences); medical record (mental/psychiatric or psychological status, medical condition/disease such as HIV/AIDS, Diabetes, Hypertension, obesity or coronary heart disease.

4. Responsibilities of Data Recipient. Data Recipient agrees to:

    a. Use or disclose the LDS only as permitted by this Agreement or as required by law;

    b. Use appropriate safeguards to prevent use or disclosure of the LDS other than as permitted by this Agreement or required by law;

    c. Report to Data Provider any use or disclosure of the LDS of which it becomes aware that is not permitted by this Agreement or required by law;

    d. Require any of its subcontractors or agents that receive or have access to the LDS to agree to the same restrictions and conditions on the use and/or disclosure of the LDS that apply to Data Recipient under this Agreement; and

    e. Not use the information in the LDS to identify or contact the individuals who are data subjects.

5. Permitted Uses and Disclosures of the LDS. Data Recipient may use and/or disclose the LDS for its Research activities only.
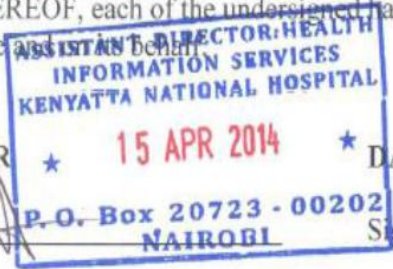
6. Term and Termination.

    a.   Term. The term of this Agreement shall commence as of the Effective Date and shall continue for so long as Data Recipient retains the LDS, unless sooner terminated as set forth in this Agreement.

    b.   Termination by Data Recipient. Data Recipient may terminate this agreement at any time by notifying the Data Provider and returning or destroying the LDS.

    c.   Termination by Data Provider. Data Provider may terminate this agreement at any time by providing thirty (30) days prior written notice to Data Recipient.

    d.   For Breach. Data Provider shall provide written notice to Data Recipient within ten (10) days of any determination that Data Recipient has breached a material term of this Agreement. Data Provider shall afford Data Recipient an opportunity to cure said alleged material breach upon mutually agreeable terms. Failure to agree on mutually agreeable terms for cure within thirty (30) days shall be grounds for the immediate termination of this Agreement by Data Provider.

    e.   Effect of Termination. Sections 1, 4, 5, 6(e) and 7 of this Agreement shall survive any termination of this Agreement under subsections c or d.

7. Miscellaneous.

    a.   Change in Law. The parties agree to negotiate in good faith to amend this Agreement to comport with changes in federal law that materially alter either or both parties' obligations under this Agreement. Provided however, that if the parties are unable to agree to mutually acceptable amendment(s) by the compliance date of the change in applicable law or regulations, either Party may terminate this Agreement as provided in section 6.

    b.   Construction of Terms. The terms of this Agreement shall be construed to give effect to applicable federal interpretative guidance regarding the HIPAA Regulations.

    c.   No Third Party Beneficiaries. Nothing in this Agreement shall confer upon any person other than the parties and their respective successors or assigns, any rights, remedies, obligations, or liabilities whatsoever.

    d.   Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

    e.   Headings. The headings and other captions in this Agreement are for convenience and reference only and shall not be used in interpreting, construing or enforcing any of the provisions of this Agreement.

IN WITNESS WHEREOF, each of the undersigned has caused this Agreement to be duly executed in its name and behalf

DATA PROVIDER   **DATA RECIPIENT**

Signed: _____   Signed: _____

Print Name: Dr. Mark Mudenyo   Print Name: Tom Joseph Oguta

Print Title: Asst. Director, Health Information, KNH   Print Title: Principal Researcher

Appendix G: Data Use Agreement with PMH

DATA USE AGREEMENT

This Data Use Agreement, effective as of   09/04/2014   , is entered into by and between   Tom Jospeh Oguta   ("Data Recipient") and   Pumwani Maternity Hospital   ("Data Provider"). The purpose of this Agreement is to provide Data Recipient with access to a Limited Data Set ("LDS") for use in research in accord with the HIPAA and Pumwani Maternity Hospital/Kenyatta national Hospital/University of Nairobi Ethics and Research Review Committee (PMH/KNH/UON-ERRC) Regulations.

1. Definitions. Unless otherwise specified in this Agreement, all capitalized terms used in this Agreement not otherwise defined have the meaning established for purposes of the "HIPAA Regulations" codified at Title 45 parts 160 through 164 of the United States Code of Federal Regulations, as amended from time to time.

2. Preparation of the LDS. Data Provider shall prepare and furnish to Data Recipient a LDS in accord with any applicable HIPAA or FERPA Regulations

3. Data Fields in the LDS. No direct identifiers such as names may be included in the Limited Data Set (LDS). In preparing the LDS, Data Provider shall include the **data fields specified as follows**, which are the minimum necessary to accomplish the research (list all data to be provided):   Participants age, education, occupation, marital status; obstetric record (previous cesarean section, surgical vaginal delivery, multiple births, such as breech presentation, distress, dystocia or other birth complications/outcomes or experiences); medical record (mental/psychiatric or psychological status, medical condition/disease such as HIV/AIDS, Diabetes, Hypertension, obesity or coronary heart disease.

4. Responsibilities of Data Recipient. Data Recipient agrees to:

    a.   Use or disclose the LDS only as permitted by this Agreement or as required by law;

    b.   Use appropriate safeguards to prevent use or disclosure of the LDS other than as permitted by this Agreement or required by law;

    c.   Report to Data Provider any use or disclosure of the LDS of which it becomes aware that is not permitted by this Agreement or required by law;

    d.   Require any of its subcontractors or agents that receive or have access to the LDS to agree to the same restrictions and conditions on the use and/or disclosure of the LDS that apply to Data Recipient under this Agreement; and

    e.   Not use the information in the LDS to identify or contact the individuals who are data subjects.

5. Permitted Uses and Disclosures of the LDS. Data Recipient may use and/or disclose the LDS for its Research activities only.

6. Term and Termination.

    a.   Term. The term of this Agreement shall commence as of the Effective Date and shall continue for so long as Data Recipient retains the LDS, unless sooner terminated as set forth in this Agreement.

    b.   Termination by Data Recipient. Data Recipient may terminate this agreement at any time by notifying the Data Provider and returning or destroying the LDS.

    c.   Termination by Data Provider. Data Provider may terminate this agreement at any time by providing thirty (30) days prior written notice to Data Recipient.

    d.   For Breach. Data Provider shall provide written notice to Data Recipient within ten (10) days of any determination that Data Recipient has breached a material term of this Agreement. Data Provider shall afford Data Recipient an opportunity to cure said alleged material breach upon mutually agreeable terms. Failure to agree on mutually agreeable terms for cure within thirty (30) days shall be grounds for the immediate termination of this Agreement by Data Provider.

    e.   Effect of Termination. Sections 1, 4, 5, 6(e) and 7 of this Agreement shall survive any termination of this Agreement under subsections c or d.

7. Miscellaneous.

    a.   Change in Law. The parties agree to negotiate in good faith to amend this Agreement to comport with changes in federal law that materially alter either or both parties' obligations under this Agreement. Provided however, that if the parties are unable to agree to mutually acceptable amendment(s) by the compliance date of the change in applicable law or regulations, either Party may terminate this Agreement as provided in section 6.

    b.   Construction of Terms. The terms of this Agreement shall be construed to give effect to applicable federal interpretative guidance regarding the HIPAA Regulations.

    c.   No Third Party Beneficiaries. Nothing in this Agreement shall confer upon any person other than the parties and their respective successors or assigns, any rights, remedies, obligations, or liabilities whatsoever.

    d.   Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

    e.   Headings. The headings and other captions in this Agreement are for convenience and reference only and shall not be used in interpreting, construing or enforcing any of the provisions of this Agreement.

IN WITNESS WHEREOF, each of the undersigned has caused this Agreement to be duly executed in its name and on its behalf.

The Medical Superintendant
Pumwani Maternity Hospital

DATA PROVIDER

Signed: _____

Print Name: Dr. Omondi Kumba

Print Title: Medical Superintendant, PMH

FUMWANI MATERNITY
HOSPITAL
P. O. Box 42849-00100, NAIROBI.
TEL. NRB. 6763291-4/ 6762965

DATA RECIPIENT

Signed: _____

Print Name: Tom Joseph Oguta

Print Title: Principal Researcher

Appendix H: Study Registration Certificate with KNH

KNH/R&P/FORM/01

KENYATTA NATIONAL HOSPITAL
Hospital Rd. along, Ngong Rd.
P.O. Box 20723, Nairobi.
Tel: 2726300-9Fax: 2725272
Research &Programs: Ext. 44705
Email: k.research@knh.or.ke

Study Registration Certificate

1. Name of the PI ...... TOM JOSEPH OGUTA

2. Email address: tom.oguta@waldenu.edu   Tel No. 0722 392 499

3. Contact person (if different from PI)...... N/A

4. Email address: ......   Tel No. ......

5. Study Title
   Psychosocial Determinants of Elective Cesarean Section Deliveries in selected Obstetric Facilities in Nairobi Kenya

6. Department where the study will be conducted ...... Reproductive Health

7. Endorsed by Head of Department where study conducted

   ✳ Name: Dr. John Ong'ech ...... Signature ...... Date 10/4/2014

8. KNH UoN Ethics Research Committee approval number ......
   (Please attach copy of ERC approval)

9. I TOM JOSEPH OGUTA commit to submit a report of my study findings to the Department where the study will be conducted and to the Department of Research and Programs.

   Signature ...... Date 09/04/2014

   Endorsed by Chair Department (only for students) of ...... N/A

   Signature ...... Date ......

10. Study Registration number (Dept/Number/Year) OBS/GYN/ 014 / 2014
    (To be completed by Research and Programs Department)

11. Research and Program Stamp ......

All studies conducted at Kenyatta National Hospital **must** be registered with the Department of Research and Programs and investigators **must commit** to share results with the hospital.

Version 1: Nov, 2013