PREVALENCE AND IMPACT OF URINARY INCONTINENCE ON QUALITY OF LIFE AMONG ADULT KIGALI WOMEN

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ABSTRACT

The World Health Organisation (WHO) described urinary incontinence (UI) as "a widespread global disease and one of the last medical taboos for many people". One out of every three women worldwide, across all age groups, is reported to have a UI problem. This UI affects multiple aspects of women's lives such as emotional well-being, day-to-day activities, social relationships and consequently, their quality of life. The aim of the present study was to ascertain the prevalence of urinary incontinence as well as its impact on the quality of life among women aged 20 to 64 years in Kigali City, Rwanda. The influence of socio-demographic characteristics and risk factors related to women's suffering from urinary incontinence was also to be ascertained. A cross sectional quantitative design was used. The sample consisted of 1030 women residing in 8 districts formed by Kigali City in Rwanda. Data were collected using the self-administered questionnaires, which were adapted from the King's Health Questionnaire and the International Consultation on Incontinence Questionnaire Short-Form to measure the subjective severity of incontinence in women. Data were analysed by statistical package for social sciences using a combination of the descriptive, and inferential statistics to ascertain prevalence and assess the association between variables such as age, parity, etc.

The study revealed that 42% of respondents were affected by a degree of urinary incontinence. Age, high number of births, mode of delivery and low level of education were found to be important risk factors to urinary incontinence amongst our respondents. Quality of life was also reduced in participants suffering from

UI. The findings suggest that the implementation of health promotion programmes should be a top priority to increase the degree of awareness of urinary incontinence and consequently, improve the quality of life of women suffering from the UI problem. Therefore, promoting continence by physiotherapists' skills and organizing better health services for urinary incontinence, readily available treatment and further clinical research should also improve the situation.

DECLARATION

I declare that "***Prevalence and impact of urinary incontinence on quality of life in adult women aged 20 to 64 years in Kigali-Rwanda"*** is my own work, that it has not been submitted for any degree or examination in any other university, and that all the sources used or quoted have been indicated and acknowledged by complete references.

November 2004

GASHUGI Muhimpundu Phophina

Signature…….

Doctor Quinette LOUW

Witness……..

DEDICATION

This work is dedicated to my loving husband Rutagwabira Barnabas and my children Sheila, Chacha, Sam, and Ken born when I was still studying.

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ABBREVIATIONS

ADL – Activities of Daily Livings

BMI - Body Mass of Index

HRQoL – Health Related Quality of Life

ICS – International Continence Society

ICIQ-SF – International Consultation on Incontinence Questionnaire-Short Form

KHQ – King's Health Questionnaire

OR – Odds Ratio

QoL – Quality of Life

UI – Urinary incontinence

WHO – World Health Organisation

PREVALENCE OF URINARY INCONTINENCE ON QUALITY OF LIFE IN ADULT WOMEN AGED 20 TO 64 YEARS IN KIGALI-RWANDA

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KEY WORDS

Prevalence

Urinary incontinence

Women

Impact

Quality of life

Epidemiology

Effect

Incidence

Leakage

Rwanda

CHAPTER ONE

INTRODUCTION

1.1 INTRODUCTION TO THE CHAPTER

This chapter covers the background information on urinary incontinence and its impact on the quality of life among women. The motivation for the study, statement of the problem, the aims, and objectives are also stated. This chapter ends with the definitions of terms used in the study and a review of the chapters.

1.2 BACKGROUND OF THE STUDY

The World Health Organisation (WHO, 1998) identified urinary incontinence (UI) as a worldwide problem with prevalence estimated at 200 million at the First International Consultation on Incontinence in France (Abrams, Koury & Wein, 1999).

Urinary incontinence or involuntary loss of urine is traditionally regarded as a problem affecting older multiparous women and is related to pregnancy and vaginal delivery. However, during the past decade UI has also been reported among fit nulliparous women (Eliasson, Larson & Mattsson, 2001). Clayton, Smith, Qureshi and Ferguson (1998) reported that UI affects people of all ages from different social and cultural backgrounds.

Women who are suffering from UI have been found to be more depressed, have higher levels of anxiety, feel more stigmatised and have poorer life satisfaction compared to women who are continent (Getliffe & Dolman, 2003). Whilst the

physical effects may not be clinically life threatening, the symptoms can have a devastating effect on the quality of life of those affected, their families and friends (Getliffe & Dolman, 2003; Abrams et al., 1999). In general, UI adversely affects daily activities, social relationships and emotional well being in women of all ages (Hägglund, Engström, Larsson & Leppert, 2001).

It is recognised that urinary incontinence represents a common but often underreported and undertreated disabling condition that has important social and economic implications both for the affected individual, their careers, family and society (O' Donnell, 1997). Embarrassment and ignorance about the subject prevents many people from seeking help (Getliffe & Dolman, 2003). This contributes to the variable prevalence results of studies (Lucas, Emery, & Beynon, 1999).

Sjöberg, Holmdahl and Crafoord (1999) reported that urinary incontinence is about three times more common in women than in men. Women are obviously more afflicted by urinary incontinence symptoms than men. This is a result of the anatomical and physiological differences, such as reproductive and hormonal changes associated with pregnancy and menopause (Avellanet et al., 2003; O' Donnell, 1997).

In Africa, several millions of women (50000 to 100000) are estimated to suffer from vesico-vaginal fistula as a result of prolonged obstructed labour, which causes urinary incontinence each year, especially in young women and primiparas (United Nations Population Funds, 2002). Therefore, the unremitting urinary incontinence that is produced by a fistula causes these women to become social

outcasts, rejected by society and even by their families (Abrams et al., 1999; Parson & Cardozo, 2003; Wall, 2002). For instance, Nigeria has a prevalence estimated as 800000 fistula sufferers who have often been subjected to major psychosocial trauma and poor quality of life (Wall, 2002).

1.3 SIGNIFICANCE OF THE STUDY

Epidemiological studies of urinary incontinence are still too disparate to be of value in the context of health policies, health economy and clinical research (Abrams et al., 1999). More studies are necessary for two main reasons. Firstly, the economic cost of incontinence, which is difficult to estimate but which is known to be considerable, and secondly, the impact of incontinence on the subject's mental and physical functioning. Modern treatments are justified both by the reduction in the cost of incontinence and by the improvement in the quality of life of patients suffering from urinary incontinence (Steg, 1992).

Physiotherapists are involved in promoting the health of women through antenatal exercises, management of urinary incontinence with pelvic floor exercises, biofeedback, cone therapy and neuromuscular electrical stimulation, as well as patient education (BØ, 2003). There is therefore a need for more physiotherapists specializing in this area, and for better collaboration between urologists and physiotherapists. Collaboration may be of benefit in better health services for urinary incontinence and for planning of future high quality clinical trials (BØ, 2003; Yoon, Song & Ro, 2002).

This will be the first study in Rwanda to determine the prevalence of urinary incontinence and its impact on the quality of life among women in Kigali-

Rwanda. The findings of this study may be used as an initiative to design a health promotion programme, which will contribute to improve the quality of life of women with urinary incontinence. In addition, this information is needed to help Rwandan physiotherapists to play their fundamental role in promoting continence among affected people.

1.4 STATEMENT OF THE PROBLEM

Urinary incontinence has already been identified worldwide for years as a health problem affecting essentially women, which can interfere with their overall quality of life. However in Rwanda, this problem has yet not been addressed adequately either because of lack of expertise, or because of cultural traditions associated with taboos among women. Indeed, social conditions of women facing this problem hinder them from seeking possibly adequate medical assistance. However it is of the utmost importance that this problem be addressed because it may lead to disability, social seclusion, psychological stress and economic burdens.

This study is a pioneer one, intended to diagnose the extent of the problem through determining the prevalence of urinary incontinence. The study will hopefully be followed by the promotion of physiotherapy to tackle the problem and therefore reduce the number of people suffering from urinary incontinence.

1.5 AIMS OF THE STUDY

The study aims to ascertain the prevalence of urinary incontinence as well as its impact on the quality of life among women aged 20 to 64 years in Kigali-Rwanda.

1.6 SPECIFIC OBJECTIVES

The specific objectives of the study are:

I. To determine the prevalence of urinary incontinence among women aged between 20 to 64 years, in Kigali- Rwanda

II. To determine if the following socio-demographic and risk factors are related to women suffering from urinary incontinence:

- Age
- Marital status
- Level of education
- Social class (level of income)
- Number of children

III. To determine how urinary incontinence affects women's quality of life in their day-to-day social life activities with respect to:

- Physical limitation
- Emotional limitation

- Social limitation
- Embarrassment
- Personal relationships
- Sleeping / Energy

1.7 DEFINITION OF TERMS

URINARY INCONTINENCE According to The International Continence Society (ICS) urinary incontinence is defined as an involuntary loss of urine that is objectively demonstrable and a social or hygienic problem (Dolan, Casson, McDonald & Ashe, 1999; Steg, 1992).

QUALITY OF LIFE is the degree to which a person enjoys the important possibilities of his or her life, and includes elements of social indicators, but perhaps most important, it is contextual (Renwick, 1996). Quality of life includes both objective and subjective indicators of physical and psychological phenomena. Objective indicators include income, living situations and physical functioning. On the other hand, subjective evaluations of quality of life represent the individual's perception of important life domains and satisfaction with those domains. Quality of life reflects an individual's sense of well-being and satisfaction with life (Mutimura, 2001).

STRESS INCONTINENCE is a leakage of small amounts of urine during physical movement like coughing, sneezing, and exercising (National Kidney and Urologic Disease Information Clearinghouse, 2002).

URGE URINARY INCONTINENCE is an involuntary urinary loss preceded by a sensation of urgency or by rapid and uncontrollable voiding with little or no warning (Peyrat, Haillot, Bruyere, Mouton, Bertrand & Larsson, 2002; Zvetanka, Milson, Kullendorff, Mollander, & Bengtsson, 1999).

MIXED URINARY INCONTINENCE is the association of stress and urge urinary incontinence (Peyrat et al., 2002).

OVERACTIVE BLADDER is a medical condition referring to the symptoms of urinary frequency and urinary urgency, with or without urge incontinence, when appearing in the absence of local pathological or metabolic factors (Van Der Vaart, De Leeuw, Roovers & Heintz, 2002; Reese, Pleil, Okano & Kelleher, 2003).

CONTINENCE is the ability to store urine in the bladder or faeces in the bowel and to excrete voluntarily where and when it is socially appropriate (Getliffe & Dolman, 2003).

NOCTURNAL ENURESIE is the complaint of loss of urine during sleep (Abrams et al., 1999).

CONTINUOUS URINARY INCONTINENCE is the complaint of continuous leakage, classically associated with a fistula (Parsons & Cardozo, 2003).

PREVALENCE is defined as the probability of being incontinent within a defined population and at a defined time point. The concept is important for establishing the distribution of the condition in the population and for projecting the need for health and medical services (Abrams et al., 1999).

HEALTH PROMOTION IN A PUBLIC HEALTH CONTEXT is intended to maintain and enhance existing levels of health through the implementation of effective programmes, services and policies. The concept of health promotion emphasizes self-care and encourages an active independent attitude towards health care rather than expert care (Mutimura, 2001).

HEALTH PROMOTION: The World Health Organisation (1986) defined health promotion as the process of enabling people to increase control over and improve their health (Renwick, 1996).

1.8 REVIEW OF THE CHAPTERS

Chapter one describes the background information of urinary incontinence and its impact on the quality of life. Motivation of the study, statement of the problem, aims, objectives and also the definitions of terms are presented. This study will contribute to knowledge on prevalence of UI, and its impact on the quality of life among women in Kigali, Rwanda. As a result a continence promotion might be launched to improve quality of life among people suffering from UI.

Chapter two presents a review of the literature that concerning UI. The prevalence, incidence, risk factors and the continence promotion by physiotherapy services are highlighted.

Chapter three outlines the research methodology, the process used to collect data (self- administered questionnaire) and the method employed to analyse the data. The chapter describes the research setting, the study design, the study sample, the

pilot study and the reliability and validity of the research instruments. Finally, the ethical considerations regarding the study are reported.

Chapter four presents the results of the data from this study

Chapter five discusses the results of the study

Chapter six presents the conclusions, recommendations, and limitations.

CHAPTER TWO

REVIEW OF LITERATURE

2.1 INTRODUCTION

This chapter discusses the prevalence of urinary incontinence among women, as the majority of those affected are women. This chapter provides insight into the impact of incontinence on the quality of life. It also discusses health promotion. The risk factors and the promotion of continence through conservative or more complex treatments to reduce the prevalence of incontinence and to improve the quality of life are also highlighted.

2.2 PREVALENCE STUDIES

The literature on prevalence studies was obtained by searching the database summarised in Table 2.1.

Table 2.1 Summary of the Data Bases and search terms used in the study

Databases	Search terms
Academic Search Premier (1990-2004) Medline (1990-2004) Cinahl (1990-2004) Science Direct (1990-2004)	Prevalence, Urinary incontinence, Women, Impact, Quality of life, Epidemilogy, Effect, Incidence, Leakage, Female

2.2.1 DEFINITIONS OF URINARY INCONTINENCE

The prevalence of incontinence varies in different reports, due to several different factors. The main reason for the variations in urinary incontinence prevalence is the different definitions (O'Donnell, 1997; Sjöberg et al., 1999). Studies on the prevalence of incontinence frequently use differing definitions of incontinence or sometimes do not state their definition at all (Clayton et al., 1998; Møller et al., 2000; Uustal et al., 2003; Thompson et al., 2002; Aggazzotti et al., 2000; Hvidman et al., 2002; Samuelson et al., 2000). It is therefore important to have a clear understanding of the definition used by the author when comparing results of research studies or prevalence data.

The International Continence Society (ICS) promotes the use of common definitions and common data collection criteria where possible to facilitate such comparison and help with effective communication between investigators (Getliffe & Dolman, 2003; Abrams et al., 1999; Steg, 1992; Minassian, Drutz, & Al-Badr, 2003). The ICS defines incontinence as " a condition where involuntary loss of urine is a social or hygienic problem and is objectively demonstrable". This definition may not be ideal for an epidemiological purpose, which is based on frequency of urine loss (Abrams et al., 1999; Steg, 1992; Dolan et al., 1999) and based on questionnaires or interviews (Minassian et al., 2003; Parson & Cardozo, 2003). The present definition is also too broad and could potentially include any patient with even one episode of UI in their lifetime.

Table 2.2.1 summarises different definitions used in prevalence studies on urinary incontinence published since 1990. A standard definition of urinary incontinence, which allows comparisons among studies is not available. This therefore leads to

several interpretations of results, and also interferes with the outcomes of prevalence studies, depending on the population surveyed and the definition used. Most of the authors (43%) of 21 studies used the International Continence Society definition to determine the prevalence of urinary incontinence.

Table 2.2.1. Urinary incontinence according to different authors

Authors/ years	No of studies	Definitions
Steg 1992; Abrams et al., 1999; Morkved et al., 1999; Dolan et al., 1999; Truijen et al., 2001; Kirkland et al., 2001; Eliasson et al., 2002; Getliffe 2003; Minassian et al., 2003.	9	ICS defined Urinary incontinence as a condition where involuntary loss of urine is a social or hygienic problem and is objectively demonstrable
Ritz et al., 1999; Luna et al., 2000; Peyrat et al., 2002; and Avellanet et al., 2003	4	Any current involuntary leakage of urine in appropriate places or inappropriate times.
Lagace et al., 1993; Chiarelli et al., 1999; Foldspang et al., 1999; Tomohiro et al., 2000	4	Loss of urine in the past 12 months or previous years
Milson et al., 2001; Parazzini et al., 2002	2	Symptoms of frequency (more than 8 micturitions per 24 hrs
Zvetanka et al., 1999	1	Involuntary urinary leakage that occurred at least once per week and considered by women to be a hygienic or social problem
Harrison et al., 1994	1	Frequency of leakage episodes and leakage when coughing, laughing, or exercising

2.2.2 PREVALENCE AND INCIDENCE

Globally the prevalence of urinary incontinence ranges from 10 to 60 % depending on the country and definition of urinary incontinence (Avellanet, Fatter, Cirera, & Coll, 2003; Palmer & Fitzgerald, 2002). Prevalence is defined as the probability of being incontinent within a defined population and at a defined time point. However, the prevalence of UI is also often estimated as the ratio of the number of incontinent respondents identified in a cross-sectional survey to the

number of all respondents in the survey (Abrams et al., 1999). Epidemiological surveys on the prevalence of urinary incontinence show that it affects many women during pregnancy and after childbirth. The reported prevalence during pregnancy ranges from 23 to 67%, and after childbirth from 6 to 31% (Mason, Walton, Appleton & Glenn, 1999; Truijen, Wyndale & Weyler, 2001).

Incidence is defined as the probability of developing the condition under study during a defined time period. Incidence is usually reported for one, two-or five-year time periods (Abrams et al., 1999; O' Donnell, 1997). Few studies have reported on the incidence of UI. A 3-year study conducted on a cohort of healthy middle-aged women showed that among the women that had previously been continent, 8% reported at least a monthly leakage. Similarly a New-Zealand study of community dwelling individuals aged 65 years or older found that 10% of the originally continent adults developed UI in the 3-year study period (Abrams et al., 1999). A 10% incidence rate over 3 years has also been reported for younger community-dwelling individuals aged 25 to 30 years (O'Donnell, 1997). The general estimate is that 10% and 20% of older men and women respectively become incontinent over a 1-year period (O'Donnell, 1997).

2.2.3 PREVALENCE REPORTED

The variability in reported prevalence reflects the heterogeneity in age, subjects, definition of urinary incontinence, the methodology and the effects of under-reporting due to the nature of the condition (Dolan et al., 1999). Table 2.2.3 summarizes the reported prevalence.

Table 2.2.3 Prevalence studies in urinary incontinence in women

Author (s)/ years	Prevalence
Lagace et al., 1993	43% of women
Chiarelli et al., 1999	12.8% of young women, 36.1% of mid-age, 35% of older women
Dolan et al., 1999	57% of women, 12% sufficiently severe to require sanitary protection
Foldspang et al., 1999	9.6% for 20-29 years, 32.4% for 50-59 years
Hojberg et al., 1999	3.9% for nulliparous, 13.8% for 1 para and 16.2% for 2 para
Morkved et al., 1999	42% during pregnancy and 38% self report after delivery
Ritz et al., 1999	20.3% of women
Zvetanka et al., 1999	3% to 32% of women increasing with age
Tomohiro et al., 2000	10.5% of men and 53.7% of women
Luna et al., 2000	31% of women
Hagglund et al., 2001	26% to 31% of women
Milson et al., 2001	15.6% of men, 17.4% of women (Overall prevalence 22.1%)
Parazzini et al., 2002	26.6% in north Italy, 17.4% in central, and 56% in southern Italy
Peyrat et al., 2002	6.2% to 38.5% of women increasing with age
Thompson et al., 2002	11% to 19% of women
Ynvild et al., 2002	25% of women increasing with age
Avellanet et al., 2003	15% to 71% of women from 15 years to over 64 Years
Uustal et al., 2003	9% to 19% of women in weekly, 23% to 25% per year
Dolan et al., 2004	3.5% pre –pregnancy, 35.6% antenatal, 13.75 % post-natal periods

2.2.4 GLOBAL DISTRIBUTIONS OF PREVALENCE STUDIES

Several prevalence studies have been conducted globally. Most studies retrieved were conducted in Europe (70.3%), 2 studies in Australia (7.4%), 2 studies in Japan (7.4%) and only 1 study in America (3.7%). In Africa, 3 studies were conducted as follows. Two studies were conducted in Nigeria. The study by (Okonkwo, 2001) reported 23% prevalence of UI. Fistula is a major cause of UI in Africa (Wall, 2000). In Ghana, the overall UI prevalence of 29% was reported (Essel, 1998). Table 2.2.4 summarises the prevalence studies from different countries

Table 2.2.4 Global distributions of prevalence studies

Authors/ publication year	No of studies	Research setting
Lagace et al., 1993	1	United State of America
Chiarelli et al., 1999; Thompson et al., 2002	2	Australia
Foldspang et al., 1999; Hojberg et al., 1999	2	Denmark
Morkved et al., 1999; Yngvild et al., 2002	2	Norway
Tomohiro et al., 2000; Luna et al., 2000	2	Japan
Milson et al., 2001; Parazzini et al., 2002	2	Italy
Milson et al., 2001; Avellanet et al., 2003	2	Spain
Milson et al., 2001; Peyrat et al., 2002	2	France
Milson et al., 2001	1	Germany
Ritz et al., 1999	1	United Arab Emirates
Dolan et al., 1999; Milson et al., 2001; Dolan et al., 2004	3	United Kingdom
Zvetanka et al., 1999; Hagglund et al., 2001; Milson et al., 2001; Uustal et al., 2003	4	Sweden
Wall et al., 2000, Okonkwo et al., 2001	2	Nigeria
Essel, 1998	1	Ghana

2.2.5 SAMPLE POPULATIONS OF PREVALENCE STUDIES

In most of the studies, the sample was large, and varied from 144 to 16776. The mean age was 47.5 years for all studies retrieved for this review, with the probability of developing UI increasing with age. Table 2.2.5 summarises the sample population studied.

Table 2.2.5 Sample population of prevalence studies

Authors/ publication year	Sample size	Description	Age groups
Lagace et al., 1993	1908	Women	20-69 years
Chiarelli et al., 1999	14000	Women	18-23, 45-50, 70-75 years
Dolan et al., 1999	1050	Women	35-74 years
Foldspang et al., 1999	6240	Women	20-59 years
Hojberg et al., 1999	7795	Women	16 weeks of gestation
Morkved et al., 1999	144	Women	Women who delivered to the hospital during 1 year
Ritz et al., 1999	200	Women	45 years
Zvetanka et al., 1999	2911	Women	More than 20 years
Tomohiro et al., 2000	3500	Women and men	40-80 years
Luna et al., 2000	1222	Women	Women who came to obstetrics or Gynaecology clinic
Hägglund et al., 2001	787	Women	18-72 years
Milson et al., 2001	16776	Women and men	Over 40 years
Parazzini et al., 2002	9613	Women and men	Less than 50 years for men and less than 40 for women
Peyrat et al., 2002	2800	Women	20-62 years
Thompson et al., 2002	1193	Women	Women aged over 16 years, checked 6 months after birth
Ynvild et al., 2002	6625	Women	20-60 years
Avellanet et al., 2003	863	Women	Over 15 years
Uustal et al., 2003	2000	Women	40-60 years
Dolan et 2004	496	Women	Primigravidae

2.2.6 STUDIES DESIGNS OF PREVALENCE STUDIES

In general, the studies reviewed were cross-sectional 10 out of 20 studies or retrospective surveys 3 out of 20 studies (65%), while (20%) of the studies used a cohort, and (5%) a case control design. Most of the studies in the literature used a mail survey, on site survey, a personal or phone interview. Longitudinal studies (10%), which are more expensive, and take a long period of time were rarely used. Table 2.2.6 summarises the different designs reported in the literature.

Table 2.2.6 Study Design of urinary incontinence studies

Author (s)/years	No of studies	Study Design
Lagace et al., 1993; Harrison et al., 1994; Dolan et al., 1999; Foldspang et al., 1999; Hojberg et al., 1999; Morkved et al., 1999; Ritz et al., 1999; Luna et al., 2000; Tomohiro et al., 2000; Milson et al., 2001; Parazzini et al., 2002; Peyrat et al., 2002; Avellanet et al., 2003	13	Survey
Chiarelli et al., 1999; Hojberg et al., 1999; Simeonova et al., 1999; Ritz et al., 1999	4	Cohort
Stewart et al., 2003	1	Case control
Chiarelli et al., 1999; Møller et al., 2000	2	Longitudinal

2.2.7 RISK FACTORS

Various risk factors for UI have been identified in epidemiological studies, the most common being age, past history of hysterectomy and obstetric events. In most of the studies, the prevalence increases with age.

Three major risk factors were identified:

- **Constitutional**: age and obesity

- **Obstetric**: pregnancy, previous caesarean delivery, previous vaginal delivery, parity, post- partum incontinence

- **Gynaecological**: hysterectomy.

Risk factors less often reported include smoking, menstrual cycle, menopause, physical forces, fluid intake, and constipation, and racial ethnic differences were also identified.

2.2.7.1 Constitutional

AGE

Most of the studies found evidence that as women age, they become more prone to urinary incontinence (Krause, Wells, Hughes, Brink, & Mayer, 2003). Since, UI is common among older women, it is often regarded as a normal and inevitable part of the aging process. The prevalence increased progressively with age. Incontinence should not be considered normal with aging even though there are changes in the bladder and pelvic structures that occur with age and which can contribute to UI (Abrams et al., 1999).

OBESITY

The studies conducted by Parazzini, Chiaffarino, Lavezzari and Giambanco (2003) found that the risk of UI increased with body mass index (BMI). Many researchers reported an association between increased weight, or increased body mass index and incontinence. According to Doran et al., 2001 every kilo adds more pressure to the bladder, which contributes to developing UI. Obesity is an

independent risk factor for the prevalence of UI. Massive weight loss significantly decreases incontinence in obese women. However, obesity remains a controversial risk factor (Peyrat et al., 2002; Samuelsson, Victor, & Svärdsudd, 2002).

2.2.7.2 Obstetric

Pregnancy is a risk factor of incontinence in itself. Urinary incontinence during pregnancy is extremely common and affects over half of pregnant women. (Eason, Labrecque, Marcoux, & Mondor, 2004). UI beginning during pregnancy roughly doubles the likelihood of urinary incontinence at 3 months postpartum, regardless of whether delivery is vaginal or by caesarean section (Eason et al., 2004).

According to Rubin (2003) women who undergo caesarean section are less likely to experience incontinence than women who give birth vaginally if UI was present prepartum. It may be a reason for an elective caesarean section by women even though they could deliver vaginally. However, it appears that the benefit of caesarean section is relatively short-lived as UI becomes more common by the age of 50 years. Women who had a caesarean section and women who delivered vaginally had similar rates of UI after the age of 50 years.

The childbearing, vacuum extraction, episiotomies, and the first vaginal delivery are known to be a risk factor for UI in young and middle-aged women. However successive vaginal deliveries did not increase the risk significantly (Morkved, Schei, & Asmund, 2003; Viktrup & Lose, 2001; Rubin, 2003).

2.2.7.3 Gynaecological

In the systematic review of evidence, the studies found that hysterectomy is associated with UI (Brown et al., 2000). Women report the onset of UI immediately following hysterectomy. The development of post hysterectomy UI might be caused by nerve damage during the procedure and disturbances of musculofascial attachments of the bladder to the surrounding pelvic wall (Hunskaar et al., 2000).

Smoking

Women who smoke seem to be at an increased risk of developing UI because they cough more frequently. The damage caused by smoking has several explanations. Smoking causes smokers to cough, which may lead to pressure transmission defects that override the benefits of stronger urethral sphincters (Samuelsson et al., 2002; Bump & McClish, 1994). Incontinent smokers tend to be younger than incontinent non- smokers, and there is also a significant association between cigarette smoking and incontinence in women. Several reasons are suggested for this association. Firstly, smoker coughing is often violent and damages components of the urethral sphincter mechanism, promoting the development of incontinence. Secondly, constituents of tobacco smoke and the antiestrogenic hormonal effects of smoking may have direct and indirect effects on bladder and urethral function (Bump & McClish, 1994). Smoking has been shown to interfere with collagen synthesis (Samuelsson et al., 2002).

One case-control study compared incontinent smokers with non-smokers, while a second compared smoking behaviour between continent and incontinent smokers. In addition, one large cross sectional study evaluated multiple risk factors for

incontinence including smoking. They found that the prevalence of UI was similar among smokers and non-smokers in one large study, but in a smaller study, smokers were more likely to report incontinence than non-smokers (these trials had different study populations). However the evidence that associates smoking and incontinence is still inconclusive. Smokers may have a different mechanism causing their incontinence than non-smokers. No data has been reported examining whether smoking cessation resolves incontinence. Therefore, it was proposed that violent coughing promotes anatomic defects, which allow incontinence (Abrams et al., 1999).

Menstrual cycle phase

Female urinary incontinence is assumed to be associated with a woman's hormonal status and fluctuations in it. A low estrogen level in postmenopausal females is considered one potential cause of UI. This hypothesis originates in part from the observation of estrogen and progesterone receptors in the urinary tract and a moderate UI increase associated with ovulation merits attention. Accordingly, female sex hormones are applied as a treatment of UI, though the evidence of effectiveness seems ambiguous (Hvidman, Foldspang, Mommsen, & Nielson, 2002).

Menopause

Urinary symptoms are an integral part of the transition from the pre-menopausal to the post- menopausal state. The atrophic changes (such as body fat, skin, and muscle), the drop in body estrogen levels brought on by menopause may contribute to an increased susceptibility to UI, vaginal dryness, and dyspareunia.

Given the evidence that atrophy of these tissues can be reversed with oestrogen, and that oestrogen replacement reduces UI in some cases, it seems reasonable to propose that oestrogen loss contributes to the problem. However, the literature is inconsistent in describing the role of menopause and oestrogen loss as significant contributors to UI (Abrams at al., 1999).

Physical forces (exercise, work)

Laborious exercise is likely to reveal the symptom of stress incontinence in otherwise asymptomatic women. Potential traumatic exercises, such as parachute jumping, may cause incontinence. There is little information which suggests that women engaged in occupations with heavy lifting are predisposed to genital prolapse and/ or incontinence. In spite of the fact that health care professionals commonly advise restricting exercise and heavy lifting following incontinence or prolapse surgery, there is no published evidence that this improves surgical outcome (Abrams et al., 1999). However, women who are physically active raise their intra-abdominal pressure more frequently than sedentary women. In particular, women participating in sport activities may risk stress incontinence during physical exertion (Eliasson et al., 2002).

Fluid intake / caffeine

In incontinent women over 55 years, there was a modest positive relationship between fluid intake and severity of incontinence. No such correlation was found in women with m.m detrusor instability (Hunskaar et al., 2000) No association was found between coffee or alcohol drinking and daily incontinence (Abrams et al., 1999, Chiarelli & Brown, 1999).

Constipation

Chronic straining may also be a risk factor in young adults for the development of stress urinary incontinence and prolapse in later life. However there have been no intervention trials that have examined the effect of resolving constipation on incontinence (Abrams, et al., 1999; Parsons & Cardozo, 2003). Three large cohorts of Australian women, who are participants in the Australian Longitudinal Study on Women's Health found a significant association with UI and conditions which increase pressure on the pelvic floor such as constipation and obesity (Chiarelli & Brown, 1999).

Racial and ethnic differences

According to Abrams et al. (1999) most epidemiological studies of UI have been conducted on white populations. However some comparative data exists and may provide evidence suggesting that white women are more susceptible to UI than black women. Furthermore the author points out the reports by Heyns (1956 p: 209) which state that black South Africans rarely developed stress incontinence and developed disorders related to pelvic floor prolapse at a rate which is 80 times lower than that of whites. Later studies of South African women report no difference in prevalence of minor nulliparous stress incontinence among white (46%), Indian (42%) and black South African nurses (40%). In the United States, white subjects had a prevalence of stress incontinence 2.3 times greater than that of black subjects. Racial differences have also been reported among pregnant women. However, the differences were evident only for stress incontinence and not for urge incontinence or other types of urine leakage (Hunskaar, Arnold, Burgio, Diokono, Herzog, & Mallett, 2000). This information could influence the

understanding of the pathophysiology of UI, as well as the evaluation and medical management of patients (Peyrat et al., 2002). Table 2.7 summarises the risk factors for urinary incontinence.

Table 2.2.7 Summary of risk factors of urinary incontinence

Author (s)/ years	No of studies	Risk factors
Abrams et al., 1999; Hunskaar et al., 2000; Peyrat et al., 2002; Rubin 2003	4	Pregnancy
Hojberg et al., 1999; Brown et al., 1999; Hunskaar et al., 2002; Peyrat et al., 2002; Krause et al., 2003	5	Age
Abrams et al., 1999; Hojberg et al., 1999; Brown et al., 2000; Aggazzotti et al., 2000	4	Parity
Brown et al., 1999; Brown et al., 2000; Hunskaar et al., 2000; Peyrat et al., 2002; Parazzini et al., 2003	5	Hysterectomy
Bump and McClish 1994; Hojberg et al., 1999; Abrams et al., 1999; Hunskaar et al., 2000; Samuelson et al., 2002	5	Smoking
Brown et al., 1999; Hojberg et al., 1999; Hunskaar et al., 2000; Peyrat et al., 2002; Parazzini et al., 2003	5	Obesity
Hojberg et al., 1999; Hunskaar et al., 2000; Peyrat et al., 2002; Parazzini et al., 2003	4	Vaginal births
Hunskaar et al., 2000; Viktrup and Lose 2001.	2	Childbirths
Hojberg et al., 1999; Viktrup and Lose 2001	2	Episiotomies
Hubert et al., 1999, Viktrup and Lose 2001; Morkved et al., 2003; Rubin 2003	4	Mode of delivery
Wall 2000	1	Fistula
Abrams et al., 1999; Hojberg et al., 1999	2	Birthweight
Aggazzotti et al., 2000; Parazzini et al., 2003	2	Urinary infection
Hojberg et al., 1999; Hunskaar et al., 2000; Peyrat et al., 2002	3	Gynecological events
Abrams et al., 1999; Hunskaar et al., 2000	2	Menopause
Abrams et al., 1999; Chiarelli et al., 1999; Hunskaar et al., 2000; Cardozo and Parson, 2003	4	Constipation
Abrams et al., 1999; Eliasson et al., 2000	2	Exercises

2.3 QUALITY OF LIFE AND URINARY INCONTINENCE

Quality of life (QoL) is a multidimensional concept reflecting an individual's experience of physical, emotional and social well being, as well as perceptions of health status (Hägglund, Engstrom, Larsson, & Leppert 2001).

Urinary incontinence affects different women in different ways and has a variable influence on their physical, psychological, social, domestic and interpersonal lifestyles. These perceptions are modified by other factors, which include age, race and culture, personal goals and experience, interpersonal relationships, general physical and mental health and life expectancy (Kelleher, 2000; Reese et al., 2003).

People with UI often suffer from a poor quality of life including loss of self-esteem, sleep deprivation, symptoms of depression or anxiety, embarrassment, financial distress and may cope by resigning themselves to restricted activities. Incontinent persons also struggle with ordinary activities such as working, shopping or travelling in a car.

In severe cases, individuals may no longer be able to work, ultimately increasing the economic burden associated with treatment costs (Zurbey, 2000; Melville, 2002; Mason, Walton, Appleton & Glenn, 1999). Incontinence can put stress on family members and can be the cause of institutionalising a relative in a nursing home (Lagace et al., 1993).

2.3.1 IMPACT ON QUALITY OF LIFE

The impact on quality of life seems to vary depending on the type, duration, severity of incontinence and the women' s age. UI may be more distressing to younger than older women (Sandvik, Kveine & Hunskaar, 1993). There is however conflicting evidence about whether the type of UI increases psychological distress, but several studies indicate that women with urge incontinence have higher mental distress and social isolation levels. This may be due to difficulties in self- management because of lack of control resulting from the inability to regulate urge UI (Grimbly, Milson, Molander, Wiklund & Ekelund, 1993).

A higher incidence of depression has been found in women with UI, but it is unclear if the incontinence causes depression or if depression causes incontinence. However, it is clear that a relationship exists between the two (Broome, 2003; Meade-D'alisera et al., 2000).

The symptoms of UI and overactive bladder are common among young adult women and have the same negative effect on quality of life as urge incontinence. The reduction in mobility associated with overactive bladder symptoms may be especially distressing for these young and active women (Van der Vaart et al., 2002).

In addition to causing embarrassment, avoidance of sexual activity and social isolation, the coital urinary leakage represents a frequently unrecognised cause of physical and psychological distress within the incontinent female population (Moran, Dwyer & Ziccone, 1999). In a retrospective analysis over a 4-year period,

it was found that over 50% of sexually active incontinent women suffer from sexual dysfunction as a result of their urinary symptoms (Moran et al., 1999).

2.3.2 MEASUREMENT OF QUALITY OF LIFE

The concept quality of life is a complex one, and as a consequence, its measurement is not simple. A number of key domains are typically included within it, which include:

- *Physical functioning*: an individual's ability to carry out so called "activities if daily living" (ADLs) including such things as self-care, cooking, shopping, household tasks and walking around.

- *Psychological functioning*: emotional and mental well-being, including levels of depression, anxiety, worry and sometimes guilt or their opposite (joy, vigour, hopefulness).

- *Social functioning*: relationships and interactions with others (family, friends and so on), including their participation in activities, and the strength and size of social networks

- *Overall life satisfaction*: an overall perception of how good (or bad) life is.

- *Perception of health status*; how individuals are able to rate their well-being, often in terms of their age or how things felt a year ago.

- *Pain*: assessed simply in terms of its severity, as well its type and impact on daily activities.

These domains may be supplemented by many others, including, sleep disturbance, sexual functioning and / or satisfaction (Abrams et al., 1999).

The measurement of incontinence and quality of life by using self-completed questionnaires (King's Health Questionnaires) is the most suitable method for assessing the patient's perspective of her incontinence and its impact on her quality of life. The self-completed questionnaires have been shown to be practical, efficient and inexpensive in a wide variety of settings. In addition to being valid and reliable, they are easy to complete, comprehensive and can be used to measure the outcome (Abrams et al., 1999). Measuring the quality of life has assumed increasing importance in the field of rehabilitation and in the medical literature over the last decade (Gill & Feinstein, 1994).

Different instruments and different samples have reported that women with urge incontinence were more affected regarding QoL compared to women with stress incontinence (Hägglund et al., 2001). A possible explanation of these reported differences might be the fact that women with stress incontinence can adapt their lifestyle and thus avoid situations (For example: avoid heavy lifting or exercising) that cause involuntary loss of urine. On the other hand, women who suffer from urge incontinence or mixed incontinence are unable to exert control over their incontinence (Zvetanka et al., 1999).

2.4 THE ROLE OF PHYSIOTHERAPY IN THE MANAGEMENT OF URINARY INCONTINENCE.

Physiotherapists are involved in promoting health in women through antenatal exercises, management of urinary incontinence with pelvic floor exercises, as well

as patient education (BØ, 2003). The pelvic floor muscle (PFM) training has proved to be an effective treatment for female incontinence. Further the author noted that it has no side effects, and is cost effective compared to surgery (BØ, 2003). Promoting urinary continence by pelvic floor exercises reduced the prevalence of UI after giving birth, particularly its severity and at three months after delivery in women who had forceps or ventouse deliveries or babies weighing 4000g or more (Chiarelli & Cockburn, 2002). Moreover, PFM training programme can easily be implemented as one part of a public health strategy to prevent UI in childbearing women (Mørkved et al., 2003).

Treatment by a specialized physiotherapist potentially produces better results than instruction by a general practitioner (Janssen, Lagro-Janssen & Felling, 2001). Patients can then practice more intensive pelvic floor exercises and bladder training under supervision. Physiotherapy methods vary, including approaches with or without appliances like biofeedback, electrostimulation, vaginal cones, and the duration and frequency of therapeutic sessions (Janssen et al., 2001).

The lack of education and knowledge relating to continence within the health and social care professions is a limiting factor in service development and delivery. This deficit often results in avoidance of the subject of continence promotion, the use of inappropriate management methods or inappropriate referrals to more expensive services that are already overloaded (Getliffe & Dolman, 2003).

There is a need for more physiotherapists specialising in this area, and for better collaboration between urologists and physiotherapists. Collaboration may be of

benefit in terms of better health services for urinary incontinence and for planning of future high quality clinical trials (BØ, 2003; Yoon, Song & Ro, 2002).

CHAPTER THREE

METHODOLOGY

3.1 INTRODUCTION

This chapter outlines the research methodology, the process used to conduct the study and the method employed to analyse the data. Finally, the ethical considerations regarding the study are described.

3.2 RESEARCH SETTING

This study was carried out in Kigali, the capital city of Rwanda. Rwanda has a population of 8 million people of whom 7.5% (Approximately 608141 people) reside in Kigali. Of the 7.5% Kigali residents, 45.3% (275515) are female. The 275515 females residing in Kigali are distributed in the eight administrative districts as follows: Nyarugenge 14.5%, Nyamirambo 17.57%, Butamwa 5.7%, Gisozi 11.93%, Kacyiru 18.79%, Kanombe 9.4%, Kicukiro 10.47% and Gikondo 11.65% (National Census Commission, 2002). Among the eight constituent districts of Kigali city, the most populated are Kacyiru, Nyarugenge and Nyamirambo. Butamwa district situated to the south-west of the city is the least populated and has the lowest population density. This district was merged into the domain of the city of Kigali during the last administrative reform in 2001 and still has portions with largely rural physical and socio-demographic characteristics (National Demographic & Health Survey, 2002) *See Appendix H.*

3.3 RESEARCH DESIGN

A cross-sectional survey with a short retrospective period of 4 weeks was conducted. The research was located within a quantitative methodological framework. A cross-sectional design is employed when all data are collected at once and at the same time (Bless and Higson-Smith, 1995). This design requires questionnaires as a research tools. It coheres with the aim and objectives of this study thus appropriate for this study in order to assess the prevalence of urinary incontinence on the quality of life among women residing in Kigali.

3.4 STUDY POPULATIONS AND SAMPLING

3.4.1 Sample size

A sample of 1200 women aged between 20 and 64 years among the 275515 women residing in Kigali city was predetermined. The number of respondents was 1030. The sample population based on the administrative districts is summarised in Table 3.4.1

3.4.2 Sampling method

A cluster sampling technique was employed to select the participants from the different districts. The clusters were classified based on the administrative divisions. Kigali is divided into 8 administrative districts and for the purpose of this study they were named “big clusters”. Each district is divided into administrative sectors and they were named “small clusters” and each sector is further sub-divided into the smallest administrative units called cells (sub clusters). The participants were recruited by visiting meetings organised by women’s associations at the sector (small clusters) level in all the eight districts.

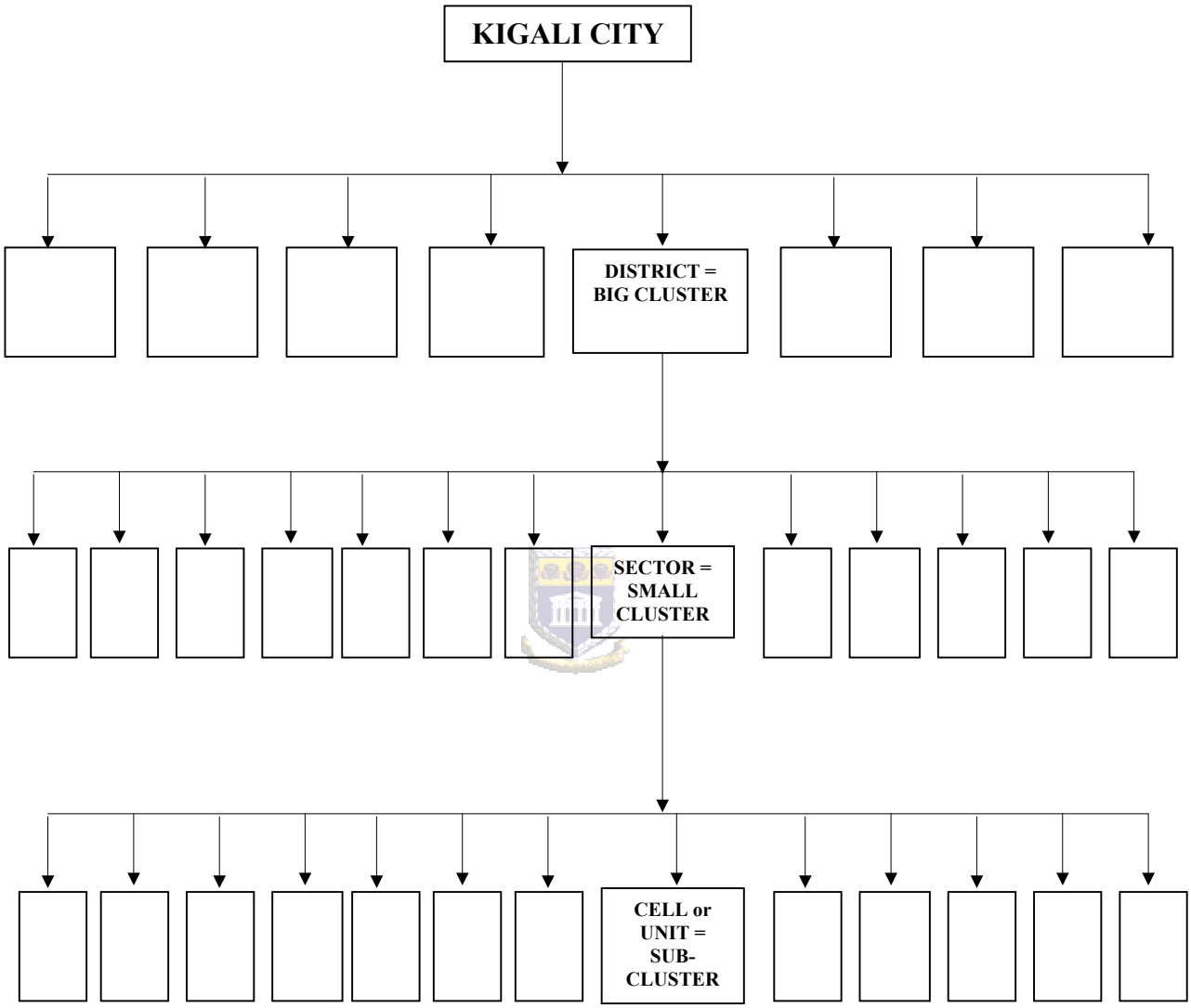
Utilising this sampling method was cost effective and saved time in conducting the research (De Vos, 2000).

Based on the De Vos (2002) principle, socio-economic conditions of females living in the selected clusters will be similar and act as guiding criteria because in general, people living in the same district are of the same social lifestyle. Table 3.4.1 represents the numbers and percentages of women who participated in the study per district.

Table 3.4. 1 Numbers and percentages of participants (N=1030)

No of women selected	Districts	Total female population	% of sample
190	Kacyiru	51776	18.79
180	Nyamirambo	48402	17.57
150	Nyarugenge	39882	14.5
120	Gisozi	32878	11.93
120	Gikondo	32095	11.65
110	Kicukiro	28845	10.47
100	Kanombe	25914	9.4
60	Butamwa	15723	5.7
Total: 1030	8 Districts	275515	100

Figure 3.1. Flow chart diagram for districts, sectors and cells in Kigali city



Kigali city has 8 districts

- Each district has between 8 to 15 sectors
- Each sector has between 10 to 20 cells/units
- Women were conveniently selected from each unit/cell as shown in the flow chart.

3.4.3 Inclusion criteria

The inclusion criteria were all women aged 20 to 64, who would voluntarily agree to participate in the study.

3.4.4 Exclusion criteria

The exclusion criteria were women with pathological or metabolic factors such as diabetes and neurological conditions, such as paraplegia, since these conditions may also lead to incontinence due to the nature of the disease (Van der Vaart et al., 2002; Brown, 1999).

3.5 PILOT STUDY

The aim of the pilot study was to assess whether the participants understood questions as well as explanations given with regard to completing the questionnaires. Two pilot studies were carried out to pre-test the questionnaires among participants who would be excluded in the main study. The first pilot study was administered to twenty-five women in Muhima sector, who satisfied the inclusion criteria. The second one was administered to twenty-five women who worked at the women's association called Haguruka Association, and who voluntary agreed to participate in the study. The response rate to the pilot study was 84% (N=50). Five questionnaires were returned without any responses and three were not returned.

The question "*What are your bladder problems and how much do they affect you?"* on the questionnaire had to be modified because no provision was made for respondents not suffering from UI. The modification read as follows: " *From the*

list below choose ONLY THOSE PROBLEM", which you have at present. LEAVE OUT those that do not apply to you.

To choose please tick √ A little ☐ Moderately ☐ A lot ☐ No problem ☐

3.6 RESEARCH INSTRUMENTS

A self-administered questionnaire was used to collect the data. This type of instrument is useful when conducting studies that aim to report on issues respondents are reluctant to respond to in interviews as they concern controversial or deviant behaviour (Babbie & Mouton, 2001). Self-administered questionnaires thus offer the respondent anonymity, are less threatening and minimize reluctance to answer questions. Questionnaires in general also yield more valid information and yield predictable outcomes due to their standardised and structured nature.

As shown in the appendices (I, J, K) the questionnaires comprised three sections:

Section A: This section of the questionnaire consists of collecting information pertaining to the socio-demographic characteristics such as age, marital status, health status, income, and level of education of the participants. Respondents were not required to include their names on any of the questionnaires.

Section B: This section consists of the "King's Health Questionnaire", which was used to assess incontinence impact and general health perceptions.

This questionnaire was developed over a number of years at Kings College Hospital in London as part of a large ongoing quality of life study. The aim of the questionnaire was not only to measure multidimensional quality of life amongst

UI women, but also to include incontinence coping strategies, global health questions and a symptom impact subscale (Abrams et al., 1999).

Section C: This section of the questionnaire measured the severity of urinary incontinence on quality of life. The bladder control questionnaire/ International Consultation on Incontinence Questionnaire-Short Form (ICIQ-SF) was used. The respondents had to indicate whether they had experienced leaking of urine as indicated by the statement within the past four weeks.

The ICIQ-SF is a simple and brief questionnaire that can be self-administered, and which was originally developed and validated in the English language (Avery et al., 2004). It provides a rapid evaluation of the impact of urinary incontinence on quality of life. It is made up of four questions that evaluate the frequency, severity and impact of UI, plus a set of eight self-diagnosis items related to the causes or situations of UI experienced by the patients.

3.7 RELIABILITY, VALIDITY AND TRANSLATION OF THE STUDY

3.7.1 Translation of the study

An expert in linguistics translated the questionnaire from English to French and to Kinyarwanda (the local languages) so that each respondent had an opportunity to answer in the most convenient language. Most of respondents preferred to answer in Kinyarwanda. In order to ensure that the questionnaires in the local languages, that is French and Kinyarwanda, assessed what the original English version was intended to, another translator re-translated these questionnaires back into English. This second version was similar to the original English questionnaire. By doing this, validity of the instrument was confirmed.

3.7.2 Reliability

Reliability means the ability of instrument to produce consistent results (Sarantakos, 1998). The KHQ and ICIQ-SF questionnaires used in this study have already been used and shown to be reliable and valid in assessing health-related quality of life in women with urinary incontinence. In addition, since cross-sectional data was collected, recall bias did not negatively affect the reliability of the data for this study.

3.7.3 Validity of The King's Health Questionnaire (KHQ)

The King's Health Questionnaire was developed and tested by psychometric test for validity. It has the merit of assessing the urinary symptoms and the impact on QoL (Reese et al., 2003, Kelleher et al., 2000). The International Continence Society has recommended that QoL measurement be included in all studies of urinary incontinence as a complement to clinical measures. Therefore, KHQ was selected as condition-specific QoL questionnaire (Kelleher et al., 2000). Several studies were conducted for validity and reliability of KHQ. This is the reason why this study adapted KHQ as a tool for assessment of QoL in women with UI. Table 3.7.2 summarises validity and reliability of KHQ.

Table 3.7.2 Validity and reliability of King's Health Questionnaires studies

Authors/years	Countries	Results of validity and reliability of KHQ studies
Badia et al., 2000	Spain	The KHQ is a valid instrument for measuring the quality of life of patients with different types of UI.
Kelleher et al., 2000	U.K	The validity and reliability of KHQ has been proved by psychometric test.
Bugg et al., 2001	U.K	KHQ is both a valid and reliable instrument for the assessment of health-related quality of life among women with anal and urinary incontinence.
Leung et al., 2002	China	The Chinese version of KHQ is a reliable and valid instrument, which would be useful in both a clinical and a research setting.
Okamura et al., 2002	Japan	KHQ may be useful to assess the detailed urination-related QoL status of elderly men and women with UI.
Reese et al., 2003	U.K	Psychometric testing supports the reliability and validity as an Overactive bladder specific measure of Health-related Quality of life (HRQoL).
Tamanini et al., 2003	Portugal	The KHQ Portuguese version was translated and adjusted for Brazilian women with UI complaints. It represents an important tool for assessment of incontinent women in clinical trials.
Uemura, and Homma, 2004	Japan	Analysis confirms psychometric properties and clinical validity of the KHQ Japanese version, which appears to offer a valid and reliable HRQoL instrument in clinical trials.
Dolan et al., 2004	U.K	KHQ has undergone psychometric tests for reliability and validity and responsiveness to change

Reliability and validity of ICIQ-SF

These questionnaires are reliable for their consistency in term of translation and have been re-tested in different languages to ensure the stability or repeatability of the instrument (Kelleher, 2000). Therefore, the method of data collection used in this study will produce valid and reliable information. Table 3.7.4 explain the validity of ICIQ-SF.

Table 3.7.4 Validity of International Consultation on Incontinence Questionnaire-Short Form (ICIQ-SF)

Authors/years	Countries	Results of validity and reliability of ICIQ-SF studies
Espuna et al., 2004	Spain	ICIQ is valid. The psychometric properties of the ICIQ-SF are satisfactory and allow to recommend the use of the questionnaire in the clinical practice.
Tamanini et al., 2004	Portugal Brazil	The ICIQ-SF was successfully translated and validated for Portuguese, according to the result of the final analysis of its measurement properties. Because of its simplicity and brevity, it becomes a practical instrument that is available for utilization in clinical research and epidemiological trials in Brazil.
Karantanis et al., 2004	U K Australia	This new outcome measure is valid for assessing incontinence severity and treatment response. Te ICIQ-SF should form a part of baseline and post-treatment assessment for all females with stress incontinence. Its also contains a measure of impact upon quality of life and recommended by ICS for assessing treatment outcome.
Avery et al., 2004	UK, Japan	The ICIQ-SF allows the assessment of the prevalence, frequency, and perceived cause of UI and its impact on everyday life. It will be use in outcomes and epidemiological research as well as routine clinical practice.

3.8 PROCEDURE

3.8.1 Training assistants

Three research assistants were trained for two days, regarding the aims and objectives of the study, their role as assistants as well as the purpose of the questionnaires. The research assistants could understand the questionnaires in those languages (English, French and Kinyarwanda).

3.8.2 Networking Organisation

The researcher and the research assistants were assigned to two districts (Big clusters) each. Clear instructions were given to the participants on how to complete the questionnaire. These instructions ensured that there was uniformity in the administration of the questionnaires among the different groups, thus ensuring that the questionnaires were completed without any misunderstandings, as well as the ethical consideration. The researcher and research assistants were responsible for collecting questionnaires after completion. *(See figure 3.1*)

3.8.3 Questionnaire Administration

Permission to conduct research was obtained from the Minister of Health and the Mayor of Kigali city (See *Appendix B and D*). Arrangements were made with the Minister of Gender who introduced the researcher to the leaders of various women's associations. The leaders of the women's associations invited the researcher to women's meetings, which were taking place around the city, and after each meeting, the gender promotion representative gave the researcher an opportunity to explain how to complete the questionnaires. The researcher and research assistants also explained the purpose of the study to the audience, gave a definition of urinary incontinence and distributed questionnaires to the women who agree voluntarily to participate in the study. The Rwandan women's associations were involved in the study following the Ministry of Gender's request urging them to promote the health of women.

3.8.4 Data analysis

The Statistical Package for Social Science (SPSS) was used to analyse the data. Descriptive statistics were used to describe prevalence. Chi-squared tests and odds ratio were done to obtain inferential statistics that reveal the risk of age, income, parity and level of education to urinary incontinence. The significance level was set at $p<0.005$.

3.9 ETHICAL CONSIDERATION

Permission was obtained from the senate of the University of the Western Cape. (*Appendix A*). Permission was also requested from the Minister of Health and Minister of Gender of Rwanda and the Mayor of Kigali city (*Appendix B, C and D).* A letter seeking consent of the participants included the purpose of the study and how the data collected would be treated. Participants were informed of the voluntary nature of the study and could decline to participate in the study. No names were required on the questionnaires and the respondents were assured of anonymity and confidentiality (*Appendix G*). This was necessary as some respondents consider the subject a taboo in Rwandan culture.

3.10 SUMMARY

Chapter 3 described the methodology used in this study. It explained the research setting and the whole procedure of how the data was collected and analysed. Finally the chapter explained how ethical considerations were applied in this study. The next chapter will discuss the results of this study.

CHAPTER FOUR

RESULTS

4.1 INTRODUCTION

This chapter describes the study results and socio-demographic characteristics of the participants. The variables described include age, marital status, income, level of education, employment status and parity (number of births). The prevalence of urinary incontinence and the risk factors are also presented.

4.2 PARTICIPANT'S SOCIO-DEMOGRAPHIC CHARACTERISTICS

A total of 1030 women responded to the survey, resulting in a response rate of 85.8% of a total sample of 1200 women to whom the questionnaires were administered in Kigali City. The socio- demographic characteristics are summarised in Table 4.1 to Table 4.5

Table 4.1 Age

Demographic variable	Years groups	No of participants	%
Age	20-24	223	21.7
	25-29	224	21.7
	30-34	168	16.3
	35-39	105	10.2
	40-44	98	9.5
	45-49	69	6.7
	50-54	65	6.3
	> than 54	78	7.6
	Total	1030	100

Most of the respondents were aged between 20 to 29 years 43.4% (n= 447 and those aged over 54 years were only 7.6% (n=78). Other respondents were aged between 30 to 39 years 26.5% (n=273), and 22.5% (n= 232) respondents were aged between 40 to 54 years.

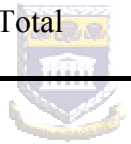
Table 4.2 Marital status

Demographic variables	Characteristics	No of participants	%
Marital status	Never married	245	23.8
	Married	552	53.6
	Separated	84	8.2
	Divorced	11	1.1
	Widow	138	13.4
	Total	1030	100

The majority of participants 53.6% (n=552) were married, followed by the never been married group 23.8% (n=245) and 13.4 % (n=138) were widowed. A minority of respondents 8.2% (n=84) were separated and only 1.1% (n=11) were divorced.

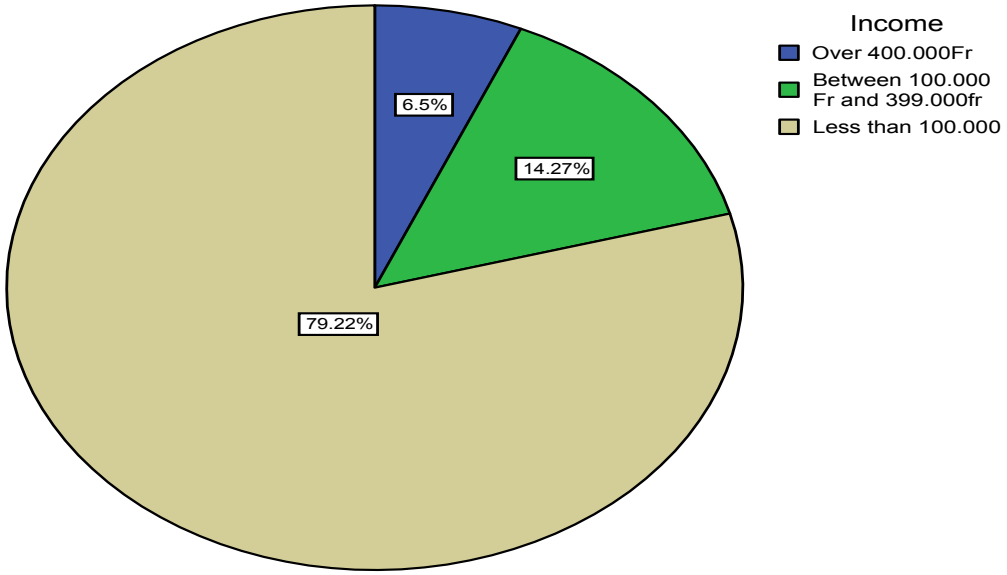
Table 4.3 Income per month

Demographic variable	Characteristics (Frws)	No of participants	%
Income	> 40.0000	67	6.5
	100.000 and 399.999	147	14.3
	< 100.000	816	79.2
	Total	1030	100



Most of the participants had a low level of income of 79.2%(n=816) less than 100.000Frw, which is equivalent to R 1250. While the middle socio-class were 14.3% (n=147), between 100.000Frw and 399.999Frw, which is equivalent to R 1250 and R 5000, and only 6.5% (67) belonged to a high level income with more than 400.000 Frw about R 5000 and above per month.

Figure 4.1 Income of respondents



Note: At the time of the survey 1Rand was equivalent to 80 Frw.

Figure 4.2 Relationship between income and bladder problems (UI)

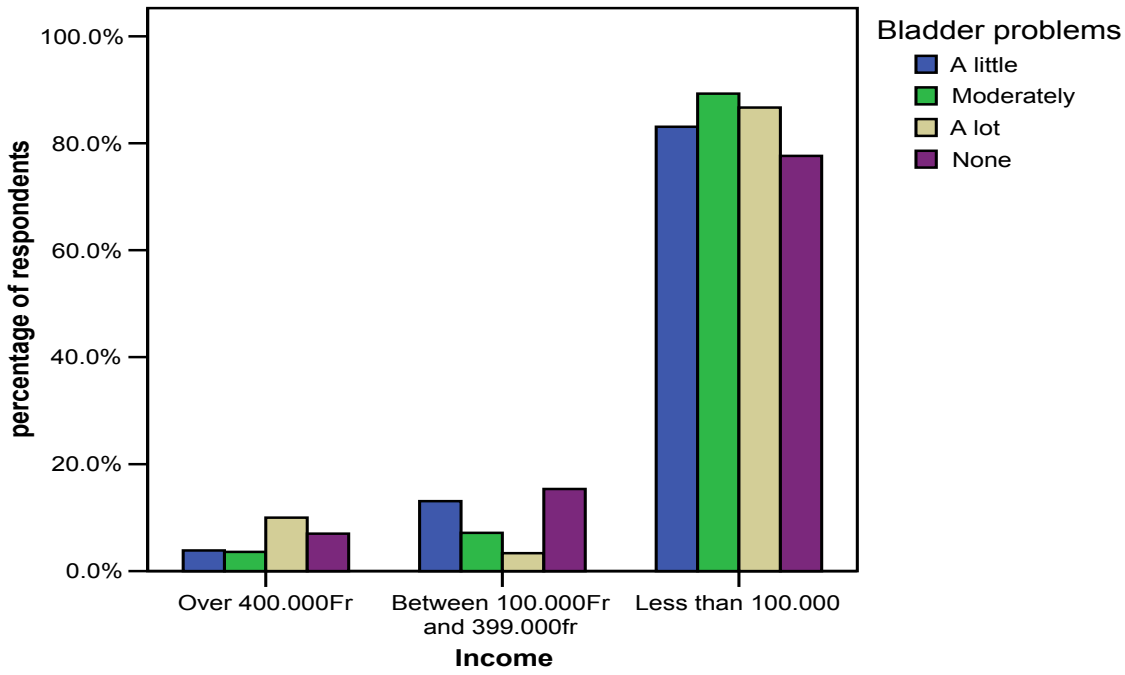


Figure 4.2 illustrates that those women who earn less than R1250 (100.000Frw) had a greater chance of suffering from bladder problems. Women who earn over R5000 (400.000Frw) had almost the same chance compared to women who earn between R1250 and R5000 (100.000Frw and 399.999Frw) per month.

Table 4.4 Level of education

Demographic variable	Characteristics	No of participants	%
Level of education	Never been to school	96	9.3
	Primary	283	27.5
	Secondary	395	38.3
	Tertiary	246	23.9
	Other (training)	10	1
	Total	1030	100

The majority of the participants had secondary education 38,3% (n=395), followed by tertiary 23.9% (n=246). About 27.5 % (n=283) had primary level of education and 19.3% l (n=93) was not educated.

Table 4.5 Employment

Demographic variable	Characteristics	No of participants	%
Employment	Unemployed	358	34.8
	Employed	525	51
	Self-employed	147	14.3
	Total	1030	100

The majority of respondents who reported that they had formal employment represented 51% (n=525), 14.3% were self-employed (n=147) and 34.8% (n=348) of the respondents were unemployed.

4.3 PARTICIPANTS' INFORMATION IN RELATION WITH RISK FACTORS. (N = 1030)

The number of participants who had 1 to 3 children was 47.5% (n=489), while those who had no children were 22.4% (n=231). Participants who had 4 to 6 children represented 22.2% (n=229) and those who had 7 to 9 children were 6.9% (n=71), and only 1% (n=10 births) had more than 10 children.

Normal birth presented the highest percentage with 58% (n=596), and only 18.4% (n=190) had had a caesarean section due to birth complication, 1.5% (n=15) had elective caesarean.

The majority of the participants 91.3% (n=940) were non-smoking and about 8.7% (n=90) were smokers.

The participants with obesity problems represented 14.3% (n=147), while 85.7% (n=883) of respondents reported a normal weight.

In relation to hysterectomy, the percentage of women who had never had a hysterectomy was 98.1% (n=1010), while 1.9% (n=20) of respondents had had a hysterectomy. Table 4.6 summarises the socio demographic health information in relation to risk factors information in percentage form (N=1030)

Table 4.6: Summary of the socio demographic health information in relation to risk factors

Risk related to UI	Characteristics	N	Percentage
Number of births (parity)	None 1 to 3 4 to 6 7 to 9 10 and > than 10	231 489 229 71 10	22.4 47.5 22.2 6.9 1
Mode of delivery	No birth Normal birth Caesarean Elective caesarean	228 596 190 15	22.1 58 18.4 1.5
Smoking	No smoker Current smoker	940 90	91.3 8.7
Obesity	Normal weight Overweight	883 147	85.7 14.3
Hysterectomy	No Yes	1010 20	98 2

4.4 HEALTH INFORMATION

Table 4.7 represents the health information of respondents in categories.

Most of the participants reported good health with 40.2% (n=414) followed by people with fair heath 29.2% (n=301) and people with very good health 19.5% (n=201). At the moment of survey, 9% (n=93) suffered from poor health and 2% (n=21) of participants suffered from very poor health.

Table 4.7: Health of participants

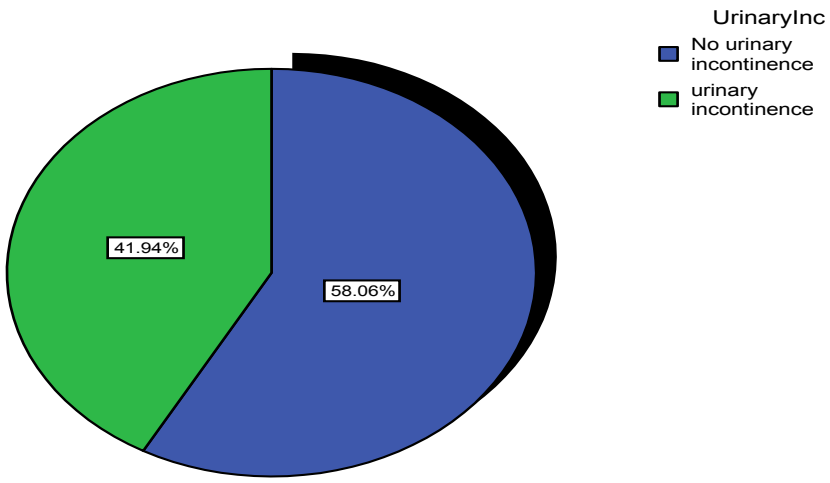
Health	No of Participants	%
Very good	201	19.5
Good	414	40.2
Fair	301	29.2
Poor	93	9
Very poor	21	2

4.5 PREVALENCE OF URINARY INCONTINENCE

The participants reported different levels of UI. Participants greatly affected by UI represented 4.9% (n=50) of the sample, moderately affected were 16.8% (n=173), and 20.3% (n=209) were slightly affected, while 58.1% (n=598) had no problem.

Figure 4.3 illustrates the overall prevalence of urinary incontinence of the participants. Over forty percent of the respondents (42%) suffered from some degree of urinary incontinence whilst the rest of the respondents (58%) never had urinary incontinence.

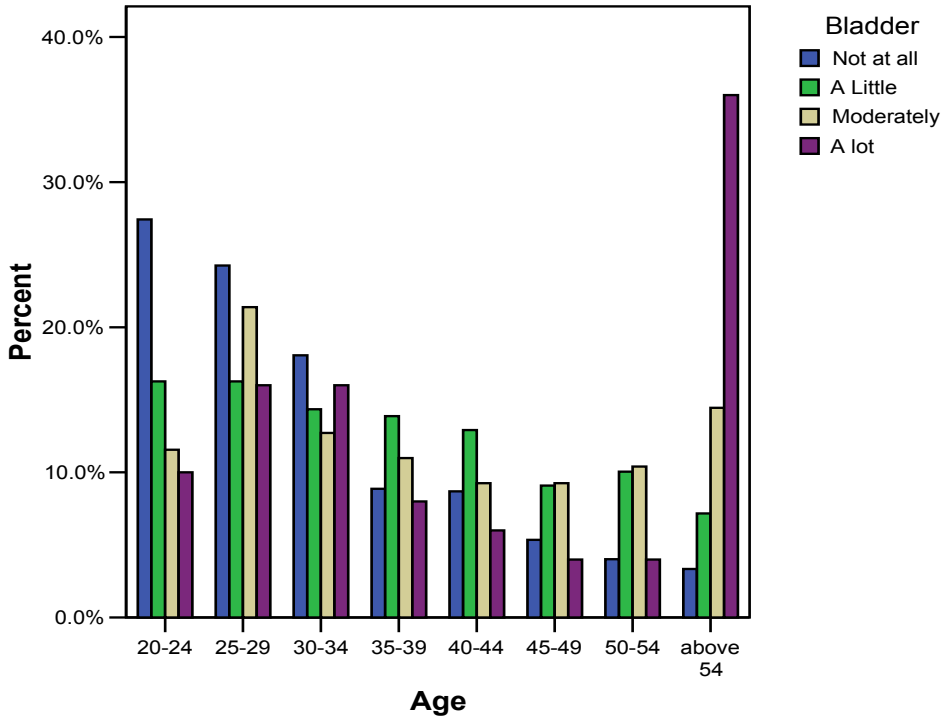
Figure 4.3 Overall prevalence of urinary incontinence



Urinary incontinence related to age

Figure 4.3 illustrates the prevalence of urinary incontinence according to age group. It appears that the peak prevalence of UI was 25 to 29 years, followed by the decrease prevalence from 30 to 45 years. By the age of 50 years, the prevalence of UI increases with increasing age

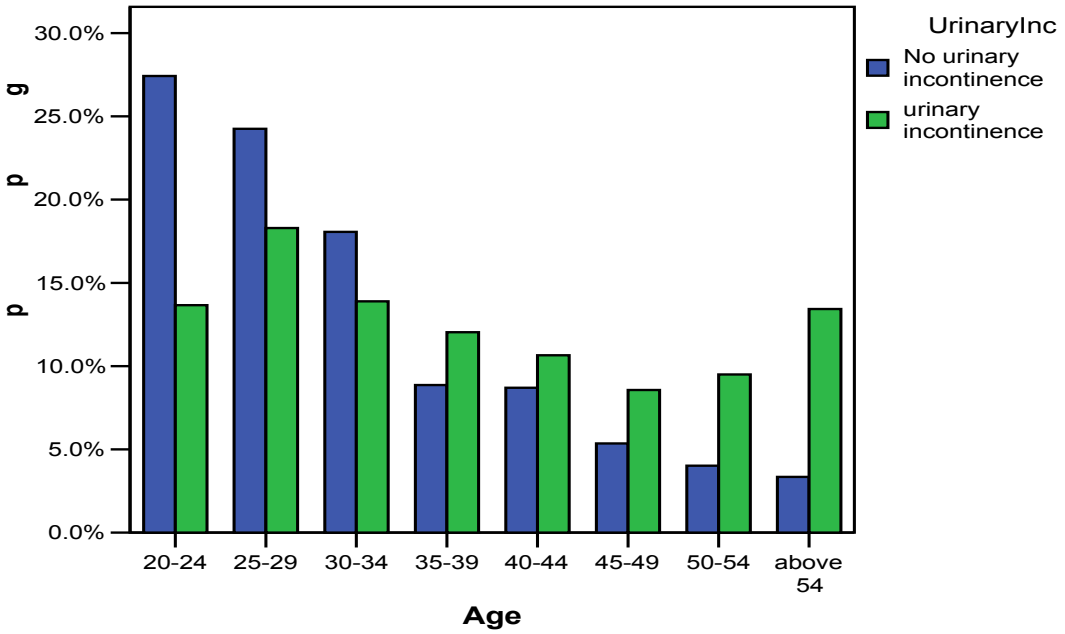
Figure 4.4 Level of effects of the bladder problems (UI) in relation to age



The original dataset consisted of categories, “Not at all”, “ a little”, “moderately” and “a lot”. The categories were collapsed to summarise the age data and provide a clearer graphical presentation of how age is related to incontinence. Since the definition applied in this study (p. 6) states that the degree of urinary incontinence must impact quality of life, the “not at all” category was combined with “a little” category and served as the “ no urinary incontinence group” in Figure 4.5. The

"moderately" and "a lot" categories were grouped together as the "urinary incontinence group" to summarise the age data in relation to incontinence.

Figure 4.5 Bladder problems (UI) in relation to age



From figure 4.5 above, it is clear that the chances of not suffering from urinary incontinence are reduced as the respondents become older (see the blue bars). More than 25% of the respondents belonging to age group 20-25 do not suffer from urinary incontinence, whilst only above 2.5% of the age group above 54 do not suffer from urinary incontinence. It is of note that people suffering from urinary incontinence in the age group 20-29 years and those above 54 years have the same percentage of people suffering from urinary incontinence.

4.6. TYPES OF BLADDER PROBLEMS AMONG UI SUFFERERS (N=432)

Table 4.8 summarises the reports of different types of bladder problems experienced by the 432 UI sufferers. The "none" category in the response column

of Table 4.8 refers to the UI participants who did not suffer from the respective bladder problem. Most of the 432 participants who experienced some degree of UI did not complain of intercourse incontinence (Table 4.8).

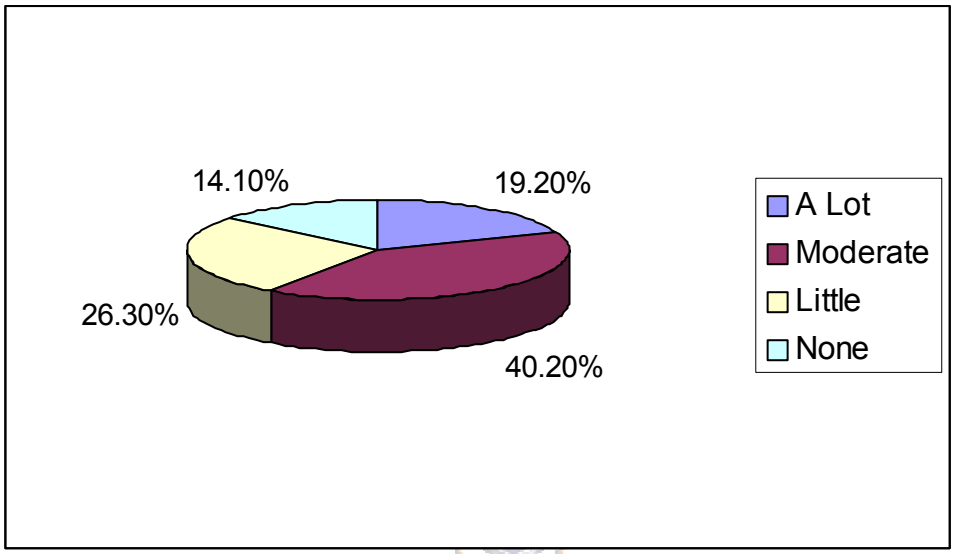
Table 4. 8 Summary reports of the different types of bladder problems (N=432)

Bladder problems of UI sufferers	Response	No of participants	% (N=432) UI sufferers
Frequency: going to the toilet very often	A little	106	24.5
	Moderately	219	50.7
	A lot	94	21.7
	None	13	3.0
Nocturia: getting up at night to pass urine	A little	116	26.8
	Moderately	203	46.9
	A lot	92	21.2
	None	21	4.8
Urgency: a strong and difficult to control desire to pass urine	A little	110	25.4
	Moderately	171	39.5
	A lot	88	20.3
	None	68	15.7
Urge incontinence: urinary leakage associated with a strong desire to pass urine	A little	114	26.3
	Moderately	174	40.2
	A lot	83	19.2
	None	61	14.1
Stress incontinence: urinary leakage with physical activity e.g. coughing, sneezing, running	A little	99	22.9
	Moderately	148	34.2
	A lot	83	19.2
	None	102	23.6
Nocturnal enuresis: wetting the bed at night	A little	89	20.6
	Moderately	63	14.5
	A lot	38	8.7
	None	242	56.0
Intercourse incontinence: urinary leakage with sexual intercourse	A little	74	17.1
	Moderately	63	14.5
	A lot	52	12.0
	None	243	56.2
Bladder pain	A little	80	18.5
	Moderately	102	23.6
	A lot	28	6.4
	None	222	51.3
Difficulty in passing urine	A little	42	9.7
	Moderately	37	8.5
	A lot	26	6.0
	None	327	75.6

Figure 4.6 below is a representation of one of the type of urinary incontinence, which affected the participants. About 86% of the 432 UI sufferers complained

from urge incontinence (Table 4.8). Figure 4.6 graphically present the different degrees of urge incontinence experienced by UI sufferers (N=432)

Figure 4.6 Prevalence of urge incontinence among 432 UI sufferers



4.7 SEVERITY OF BLADDER PROBLEM AMONG UI SUFFERERS (N=432)

Table 4.9 shows the severity of the bladder problem among the participants who indicated that they suffer from some degree of UI (N=432). Participants were asked to indicate the interference of UI with their everyday life on a scale of 0-10 (*Appendix I:* Section C of questionnaire). In order to describe the data, responses 1-3 was grouped to present "slight" interference, 4-6 present "moderate" and responses 7-10 present "significant" interference with daily everyday life (Table 4.9)

Table 4.9 Severity of urinary incontinence among the 432 UI sufferers

Variables	Characteristics	No of participants	%
How often do you leak?	Never	64	14.8
	About once a week or less often	98	22.6
	Three times a week	90	20.8
	About once a day	62	14.3
	Several times a week	82	18.9
	All the time	35	8.1
	Total responses	431	
How much urine do you leak?	None	59	13.6
	A small amount	205	47.5
	A moderate amount	110	25.5
	A large amount	57	13.2
	Total responses	431	
How much does leaking urine interfere with your everyday life?	Not at all	49	11.3
	Slightly	178	41.2
	Moderately	140	32.4
	Significantly	64	14.8
	Total responses	431	
When does urine leak	Never-urine does not leak	52	12.0
	Leaks before you get to the toilet	112	25.9
	Leaks when you cough	54	12.5
	Leaks when you are asleep	5	1.1
	Leaks when you are exercising	87	20.1
	Leaks when you have finished urinating and you are dressing	20	46.2
	Leaks for no obvious reason	61	14.1
	Leaks all the time	41	9.4
	Total responses	432	

4.8 SOCIO DEMOGRAPHIC CHARACTERISTICS AND RISK FACTORS RELATED TO WOMEN SUFFERING FROM URINARY INCONTINENCE.

Age

The odds ratio was calculated to investigate the chances or the extent to which a person might suffer from urinary incontinence with respect to age groups.

By the age of 20-34 years the odds ratio were insufficiently low risk of 0.5 and 0.7. The odds ratio was higher for the 35-49 years old group with 1.2 and 1.5, which is a slight risk of UI. Women aged 50 years and above were classified as

belonging to a group with a high risk of urinary incontinence with odds ratio 2.3 and 3.9. Therefore, from this analysis, the odds ratio denoted age as a risk factor and the risk increased with age.

Chi-square tests were also used to demonstrate the association between urinary incontinence and age. There was a significant association (p=0.000 <0.005).

Table 4.10 Odds ratio (risk) by age group

Age	No UI	UI	Total	Risk/Odds Ratio
20-24	164	59	233	0.50
25-29	145	79	224	0.75
30-34	108	60	168	0.77
35-39	53	52	105	1.35
40-44	52	46	98	1.22
45-49	32	37	69	1.59
50-54	24	41	65	2.34
Above 54	20	58	78	3.95
Total	598	432	1030	

Marital status

The "never married" and "married" group showed a low risk of UI (Table 4.11) Divorced women appear to have a greater chance of developing UI. (OR= 1,09).

Chi-square tests were used to find association between urinary incontinence and marital status. There was a significant association (p=0.000<0.005).

Table 4.11 Odds ratio (risk) by marital status

Marital status	No UI	UI	Total	Risk/Odds Ratio
Never married	197	48	245	0.26
Married	316	236	552	0.21
Separated	32	52	84	0.46
Divorced	2	9	11	1.09
Widow	51	87	138	0.49
Total	598	432	1030	

Level of education

Participants who had no level of education (never been to school) were more likely to suffer from UI (odds ratio=1.26) compared with women who had some form of education (Table 4.12)

Chi-square Tests were used to demonstrate association between urinary incontinence and level of education. There was a significant association ($p=0.000<0.005$).

Table 4.12 Odds ratio (risk) by level education

Level of education	No UI	UI	Total	Risk/Odds Ratio
Never been to school	44	52	96	1.26
Primary	153	130	283	0.26
Secondary	223	172	395	0.22
Tertiary	174	72	246	0.12
Other	4	6	10	0.41
Total	598	432	1030	

Number of births

Participants who had never given birth were at a low risk of UI with (OR= 0.3). However, participants who had 1 to 3 children had less risk of UI (OR=1) compared with respondents who had 4 to 6 children (OR=1.4). Women who had 7 – 10 children ran a higher risk of developing UI (OR=3.2 and OR=2.9). Chi-square Tests were used to find the association between the number of births and urinary incontinence. There was a significant association ($p=0.000< 0.005$).

Table 4.13 Odds ratio (risk) by number of births

Number of births	No UI	UI	Total	Risk/Odds Ratio
No births at all	187	44	231	0.32
1-3 births	277	212	489	1.06
4-6 births	110	119	229	1.49
7-9 births	21	50	71	3.25
10 and more than 10 births	3	7	10	2.96
Total	598	432	1030	

Mode of delivery

Participants who delivered normally (vaginal birth) ran a great risk with (OR=1) compared with women who had caesareans (OR= 0.2)

Fisher's Exact Test (2x2 table) was used because of the smaller cells, to explore the association with caesarean and urinary incontinence. No significant association between caesarean section and urinary incontinence was found, p=0.803. Therefore, this study shows that caesarean delivery is not a risk factor for UI.

Table 4.14 Odds ratio (risk) by mode of delivery

Mode of delivery	No UI	UI	Total	Risk/Odds Ratio
Normal birth	406	381	787	1.00
Caesarean	9	7	16	0.22
Total	415	388	803	

4.9 THE EFFECTS OF BLADDER PROBLEMS ON QUALITY OF LIFE

Urinary incontinence has multiple implications for the sufferer. All subjects (N=1030) completed Section B of the questionnaire in order to compare the impact of quality of life among the UI sufferers and non-UI sufferers. Table 4.15 shows some of the limitations regarding daily activities. For example, emotionally, UI participants are highly depressed 6.5% (n=67), moderately 9% (n=93) and slightly 12.9% (n=133) depressed.

Regarding anxiety UI participants reported themselves as highly affected (6.5%; n=67), moderately affected 8.4% (n=87 and slightly affected 14.4% (n=148). A few of the women 4.7% (n=48) reported wearing pads all the time and being very embarrassed greatly 5.7% (n=59).

Regarding social limitation, 5.1% (n=53) of the participants reported no real restriction when visiting friends, while 4.3% (n=44) reported restrictions.

Table 4.15 Impact of bladder problems on quality of life

Effects	Variables	Characteristics	No of participants	%
Role limitation	Households tasks	Slight	138	13.4
		Moderately	137	13.3
		A lot	51	5
	Job/activities outside	Slight	122	11.8
		Moderately	131	12.7
		A lot	46	4.5
Physical limitations	Physical activities	Slight	113	11
		Moderately	157	15.2
		A lot	50	5
	Ability to travel	Slight	109	10.6
		Moderately	107	10.4
		A lot	51	5
Social limitations	Restriction of social life	Slight	112	10.9
		Moderately	94	9.1
		A lot	44	4.3
	Ability to visit friends	Slight	111	10.9
		Moderately	86	8.3
		A lot	53	5.1

Table 4.16 Impact of bladder problems to quality of life

Effects	Variables	Characteristics	No of participants	%
Personal relationships	With a partner	Slight	71	6.9
		Moderately	48	4.7
		A lot	31	3
	Sex life	Slight	47	7.6
		Moderately	38	4.6
		A lot	497	3.7
	Family life	Slight	64	6.2
		Moderately	40	3.9
		A lot	27	2.6
Emotions	Depression	Slight	133	12.9
		Moderately	93	9
		A lot	67	6.5
	Anxiety	Slight	148	14.4
		Moderately	87	8.4
		A lot	67	6.5
	Feeling -bad	Slight	145	14.1
		Moderately	84	8.2
		A lot	43	4.2
Sleep/Energy	Sleep	Slight	148	9.1
		Moderately	94	4.3
		A lot	44	76.3
	Tired	Slight	135	13.1
		Moderately	81	7.9
		A lot	28	2

Figure 4.7 Urge incontinence in relation to depression

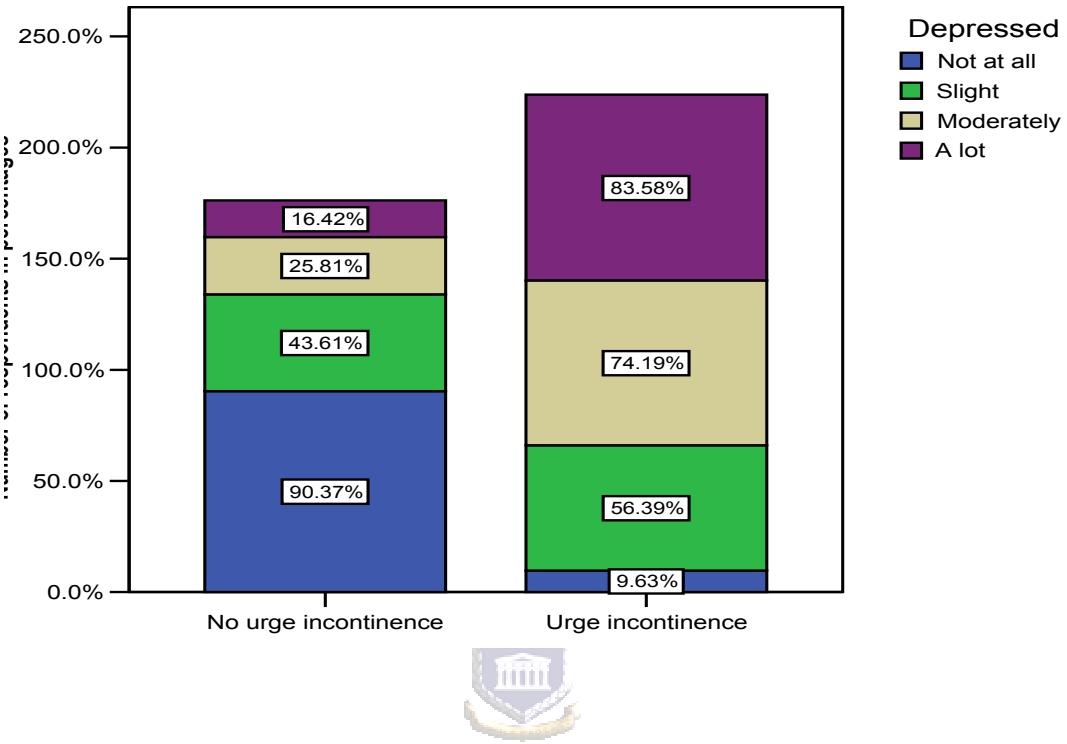


Figure 4.7 above shows that 90% of respondents who are not suffering from urge incontinence were not depressed, whilst 84% of respondents suffering from urge incontinence were depressed most of the time. 74% of respondents suffering from urge incontinence were moderately depressed whilst only 26% of the respondents not suffering from urge incontinence were moderately depressed. Depression as seen from Figure 4.6 increases as the urge incontinence increases

Figure 4.8 displays urge incontinence plotted against sex life. The aim is to see whether urge incontinence affects an individual's sex life. Most of the respondents (83%) who are not suffering from urge incontinence selected the 'Not applicable' option. It might be because they are sexually inactive or that they could not understand the question clearly. Of the people who are sexually active and are not suffering from urge incontinence, the majority (79%) indicated that their sexual life is not affected at all. Whilst 70% of the respondents suffering from urge incontinence have their sexual life affected by the urge incontinence.

Figure 4.8 Urge incontinence in relation to sex life.

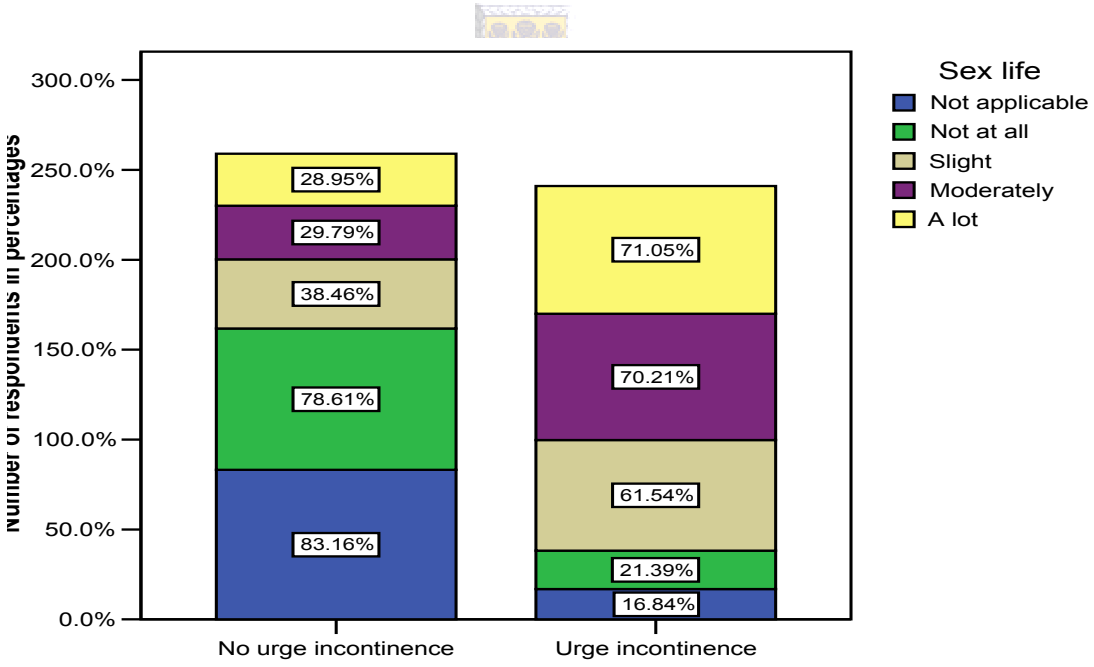


Figure 4.9 displaying the effect of urge incontinence with respect to the sleep of the respondents. Only 10% of the respondents affected by urge incontinence sleep soundly. The majority of the respondents 75% suffering from urge incontinence reported sleep disturbances.

Figure 4.9 Urge incontinence in relation to sleep disturbances

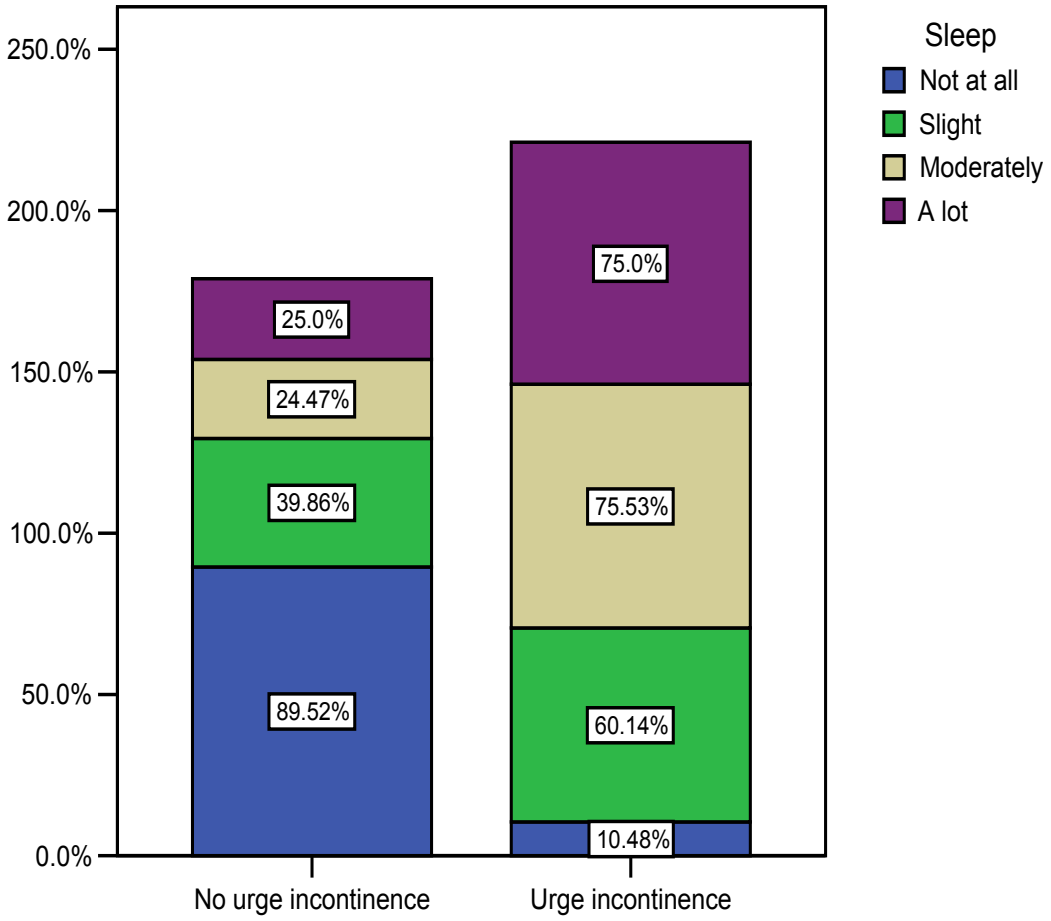


Figure 4.10 Urge incontinence in relation to embarrassment

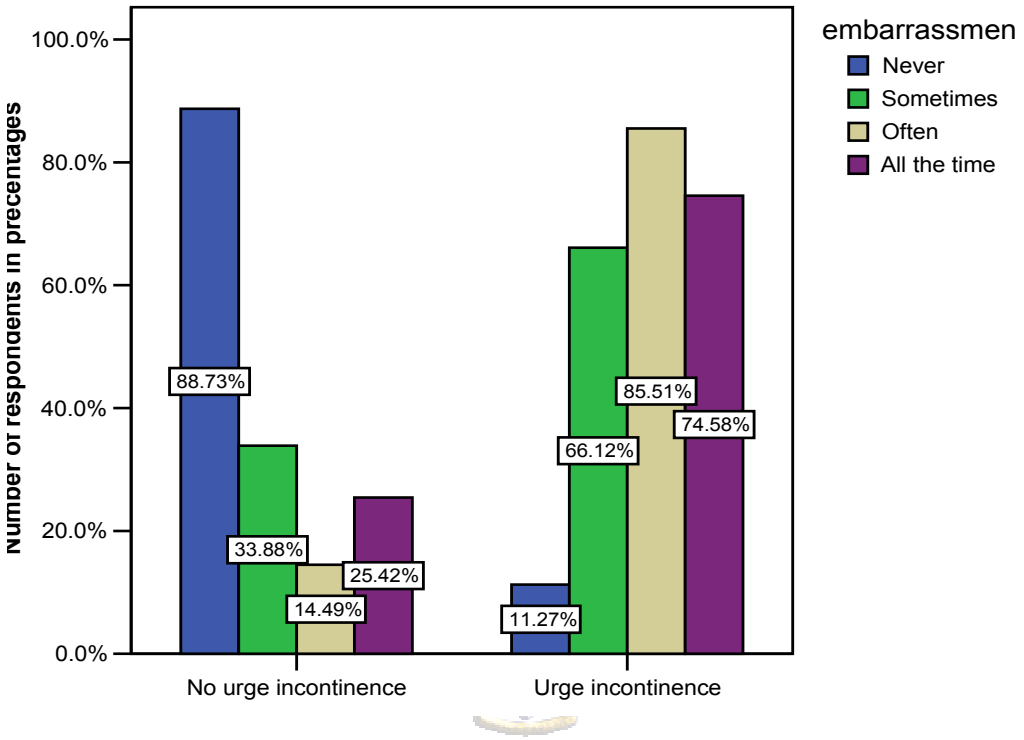


Figure 10 above shows that 75 % of women suffering from urge incontinence are embarrassed all the time compared to women who not suffering at all from UI. The latter are also embarrassed some of the time (25%) but for a number of reasons not including UI.

Respondents suffering from urge incontinence (85%) were often embarrassed while only 14% of the respondents not suffering from urge incontinence were often embarrassed.

SUMMARY

This chapter highlighted the findings of the study. The results showed that middle-age women are more affected by UI. Interpretation of results will be discussed in chapter five.

CHAPTER FIVE

DISCUSSION

5.1 INTRODUCTION

The objectives of the study were to determine i) the prevalence of UI among women in Kigali, ii) how the socio-demographic and risk factors are related to women suffering from UI, iii) how UI affects women's quality of life in their day-to-day social life activities.

In this chapter, the significant findings within the study will be briefly discussed. The limitations of the study are also highlighted

5.2 LEVEL OF PARTICIPATION IN THE STUDY

In this study the response rate was 85.8% in a sample of 1200 women. This is a high response rate compared to similar studies and reveals the participants' high awareness of women's health status. Similar findings have been revealed in other studies. In the principality of Andorra in Spain a response rate of 87.9% in a sample of 863 women was found (Avellanet, 2003), in the UK, a response rate of 82.6% in a sample of 384 women aged 20 to 59 years was found (Harrison & Memel, 1994).

Female incontinence is a subject that is rarely discussed among the Rwandan women. However the response to this study shows that the subject requires attention. It is a subject that is still considered taboo and not talked about or

discussed in public and women appear not to be aware of how exactly to address the issue. Rwandan women appear not to be aware of the available services. In addition Rwanda itself has neither a Urology centre nor a specialist in the area. Published information is lacking, but in informal discussions with the respondents it appeared that the problem is frequently not mentioned to the physicians and the women had a very low awareness of urinary incontinence. Similarly reported low awareness of urinary incontinence among the Japanese women (Tomohiro et al., 2000)

5.3 FEMALE INCONTINENCE IN KIGALI

Urinary incontinence appears to be a worldwide problem affecting women of all ages and across different cultures and races. Different prevalence rates have been reported in the literature. This has been attributed to differences in definitions, methodology and populations studied (Minassian et al., 2003).

The overall prevalence of UI in the sampled subjects of the study was 42 in every 100 women in Kigali. One would be cautious to extrapolate these findings to the whole population. It is noted that sampled total populations in a certain geographical location with a high response rate reflect the prevalence of UI more accurately than samples taken from doctors' offices with a low response rate (Minassian et al., 2003). This is evidenced by the findings of this study. The incontinence prevalence in this study was high and resembles findings from other researchers. Lagace et al. (1993) found UI rates in women to be 43%, Morkved et al. (1999) found UI rates in pregnant women to be 42%, Avellanet et al. (2003,) found the proportion of UI in women with regular UI (not sporadic) to be 45.3%,

Peyrat et al. (2002) reported UI rates in women to be 38.5% in France. While prevalence of UI in this study was found to be 42%, other studies similarly have reported a higher UI prevalence. In Somes previous studies such as Tomohiro et al. (2000) found 53.7% in Japan , Parazzini et al. (2002) found 56% in Southern Italy, Avellanet et al. (2003) found 71% in Spain , Dolan et al.(1999) found 57% in the UK. There are others studies that reported low UI rates in comparison with these findings and ranged from 20% to 36% and was conducted in Asia, Europe and Middle East (Luna et al., 2000, Chiarelli et al., 1999, Foldspang et al., 1999). The lowest prevalence (20.3%) was reported in United Arab Emirates (Ritz et al., 1999).

According to these findings, the 20 to 34 years old age group had a high prevalence of women suffering from UI and decreased amongst the 35 to 49 years old age group. The trend of the prevalence in these different age groups could probably be explained by the fact that the 20-34 year old group constitute most women delivering for the first time. Vaginal delivery causes partial denervation of the pelvic floor in most women having their first baby (Allen, Hosker, Smith& Warrell, 1990). Another explanation could probably be the high physical activity in these young women. There is evidence in the literature that physical activity is a risk factor to UI. It is known that young, highly fit women who have never been pregnant can still have symptoms of UI when exercising. About one third of women experience urine loss during physical activities. Causes of incontinence may include inadequate abdominal pressure transmission, pelvic floor muscle fatigue, and changes in connective tissues or collagen of the pelvic floor muscle.

Sports most likely to provoke UI include those that create a sudden increase in intra-abdominal pressure (Moore, 2001).

However, the prevalence rate also increases from 50 years of age and above. Women, aged 50 and above are at increased risk of developing urinary incontinence. Several studies have shown that within the adult age range, prevalence figures for any urine loss increase with increasing age, because major organ systems gradually decline with advancing age (Merkelj, 2001). Moller et al. (2000) observing a trend of a maximum prevalence of UI at the age of 50 years. These authors could not find an explanation for the trend. From the results of our study 99 out 143 (69.2%) respondents aged 50 years and above were found to have urinary incontinence. This accounts for approximately 10% of the sample (1030). The finding is in agreement with Moller et al. (2000). An explanation could be decreasing level of oestrogen which causes weakness in the bladder, urethra and pelvic muscles with increasing age, and systemic diseases such as diabetes and the anatomical changes in the structure of the pelvis. Jackson et al. (2004) in their study found UI to be associated with arthritis, oral estrogen use, a high body mass and obstructive pulmonary disease. The findings of this study coupled with the findings of other researchers are suggestive of UI being a multietiologic disease and a management approach that includes multiple strategies is needed. Incontinence is considered to be normal with aging because it comes with changes in bladder and pelvic structures. Pelvic muscle relaxation accelerates rapidly and may progress with aging in general (Moore, 2001). This causes prolapse of pelvic organs in women. Estrogen depletion is associated with diminished urethral mucosa vascularity and thickness. This deterioration and a

decline in mucus production within the urethra weaken the urethra's ability to maintain a tight seal, especially when intra-abdominal pressure increases (Moore, 2001). However, with proper management and preventive strategies the incontinence can be controlled.

5.4 FINDINGS RELATED TO SOCIO-DEMOGRAPHIC AND RISK FACTORS

5.4.1 Age

The findings of this study reveal a significant relationship between age and UI ($p<0.005$). It appears that women of all ages in kigali are affected by UI this is in agreement with findings from other studies. Clayton et al., 1998 in their study found women from different walks of life to be affected by UI. The finding in this study of women aged 50 years and above showed a high prevalence of UI is not a coincidence. It has been evidenced by several other studies (Peyrat et al., 2000, Abrams et al., 1999, Ritz at el., 1999).

5.4.2 Parity / number of birth

The findings of the present study support a link between UI and parity and an increased number of births may increase the prevalence of UI. The chi-squared test revealed a strong association between parity and UI. Rwandan women in Kigali have a very high fertility rate. On average there are six children per woman of reproductive age (National Demographic and Health Survey, 2000). In Kigali where the present study was done, the average woman of childbearing age has 5 children (Rwanda Demographic & Health Survey, 2000). Therefore it appears that Rwandan women stand a very high risk of UI. Another argument is the African

culture and traditions encourage a woman to give birth to as many children as God gives. In the aftermath of the Rwandan genocide it may appear that many women will want to give birth to more children to compensate for family members that were lost. Awareness might help and guide women into taking responsibility and avoiding the risks and as a consequence reducing the prevalence. There are findings in the literature reporting similar findings to those in this study, with regard to parity (Luna et al., 2000 & Abrams et al., 1999). These authors were of the view that multiparous women were more likely than nulliparous to experience UI. They reported an increase in the prevalence of urinary incontinence among women who had given birth to one or more live children. Milson et al. (1993) and Foldspang et al. (1992) also noted a direct relationship between parity and prevalence of incontinence. They found an increase in prevalence of incontinence with the increasing number of live births.

5.4.3 Level of education and income

The findings of this study reveal an association between education and UI prevalence. Women with a lower level of education manifested a higher UI prevalence ($p<0.005$). In addition women with no education were at high risk of UI (OR=1.2).

In Rwanda there is a higher proportion of women with no education. It is reported that only 58% of women in Rwanda are literate (National Demographic &Health Survey). The findings of this study correspond with those of Parazzini et al. (2003). The fact that the findings in this study are similar to those of Parazzini could emanate from the fact that women with higher levels of education can hide

the condition better than women with a lower level of education, who appeared to be glad to find someone interested in their bladder control problem. UI is usually a hidden problem, either because women consider the problem as normal or are embarrassed to point it out. In Rwanda, the misconceptions and cultural taboos surrounding issues of bladder control could possibly make it difficult for people suffering from the problem to talk openly about it. Another contributing factor to the findings in this study could be the low response rate of women with high education compared to that of women with low education levels, despite the study being anonymous.

In Kigali city, 8% of the women have no education, 54% have a primary level of education and 38 % of women have a secondary or tertiary level of education (National Demographic & Health Survey, 2000).

Avellanet et al. (2003) in their study noted that women with a high level of education manifest a higher UI prevalence. Possibly, the high level of education leads to a higher degree of awareness of the presence of UI and hence the high reporting which could account for the high prevalence. This is in contrast with another study conducted by Parazzini et al. (2003) who found that the risk of UI was lower in more educated women than in women of lower education levels.

The majority of participants earned less than 100.000 Rwandan francs, the equivalent of Rands1250 per month. Thus, the level of education determines the socio-economic status. In this study, the lower level of income, and education contribute to a higher level of UI experience. Among the lower classes, the nature of work may be more physically demanding than that of more sedentary work of

women with a higher level of education and may have an effect on bladder health. Similar findings have been reported in America (Palmer & Fitzgerald, 2002) among working women.

5.4.4 Mode of delivery

In this study, it was demonstrated that vaginal delivery carried a risk for UI (OR=1), while caesarean section carried very low risk (OR=0.2). The analysis to establish whether there was any association between caesarean section and UI was insignificant (p=0.803). The literature has reported vaginal delivery to one of the major risk factors for stress incontinence among multiparous women (Goldberg et al., 2003; Parazzini et al., 2003; Eason et al., 2004). These studies support the idea that women who have a caesarean section are less likely to experience incontinence of urine than women who deliver vaginally. Dolan et al. (1999) noted that the rising demand for elective caesarean and a trend towards smaller families might influence the prevalence of UI in the future. Some of the reasons why there is a reported high prevalence of UI with vaginal delivery could possibly be that vaginal birth may result in pelvic floor laxity as a consequence of deteriorating and stretching of the muscles and connective tissues during delivery. These factors compounded with lack of post-partum physical exercise of the pelvic muscles, which could be a contributor to their failure to return to the original level (Eason et al., 2004). In addition, injury to tissues of the pelvic floor can occur as a result of perinea trauma during the different processes of delivery (episiotomies, forceps, vacuums, birth weight, the duration of active pushing in the labour period). The result of these events can impaired the support of the

pelvic organs and change their position. These neurophysiologic changes could lead to UI (Eason et al., 2004).

5.6 QUALITY OF LIFE IN WOMEN WITH URINARY INCONTINENCE

In the present study quality of life information was obtained using a validated QoL questionnaire (KHQ), a survey of women without other medical complaints completed that. This study investigated how UI affects the QoL of women in their daily activities. The findings are interesting in that they revealed women's reported perceptions of QoL with a well-recognized QoL questionnaire. In general, UI appears to adversely affect daily activities, social relationships and emotional well being in women of all ages. It is also possible that UI may affect the young and old differently. For example, exercise restriction or sexual dysfunction due to UI may be more problematic in young women than in much older adults. Depression, disturbances in sleeping, and anxiety were common in women who suffered from UI irrespective of age or marital status. This finding is similar to findings from other studies conducted in America (Meade-D'Alisera et al., 2000; Melville et al., 2002, & Lagace et al., 1993).

There are previous studies that reported that there might be a physiological link between depression and incontinence since women with urge incontinence suffered from depression, which explain the effectiveness of antidepressants in treating some types of UI, especially urge incontinence. The authors pointed out the dilemma: "Do depressed persons become incontinent or does the incontinence cause depression?"(Zorn et al., 1999 & Broome, 2003). If depression can cause UI in this particular case, the depression rate can be biased because the

information was collected shortly after the commemoration of the genocide (April-July 1994-to April-July 2004). During these periods many orphans and widows manifested some degree of psychosocial traumatism and depression, which may lead to UI.

SUMMARY

The discussion dealt with the major finding of the study. Similarities with other studies were found with regard to the socio-demographic characteristics related to the risk factors of UI and the prevalence study. The summary of the study, conclusion and recommendations based on the findings will be explained in the next chapter.

CHAPTER SIX

RECOMMENDATIONS, LIMITATIONS AND CONCLUSIONS

6.1 SUMMARY

The aim of the study was to ascertain the prevalence of urinary incontinence as well as its impact on the quality of life among adult women aged 20 to 64 years in Kigali.

Urinary incontinence has been identified and described at a global level over the years as a health problem affecting essentially women. It can to interfere with their overall quality of life. Urinary incontinence has not been adequately addressed in Rwanda. This we noted is either because of lack of expertise, or because of cultural traditions. Talking about incontinence is taboo in Rwanda. Indeed, it seems apparent that the socio-cultural conditions of Rwandan women facing this problem and their lack of knowledge of the problem hinders them from seeking adequate medical assistance. It is, therefore, as earlier stated in Chapter 1, of utmost importance that urinary problems confronting Rwandan women be addressed, as it may lead to disability, social seclusion, psychological stress and economic burdens.

This study aimed to assess UI prevalence and associated factors. Results revealed a high prevalence of UI among Kigali Women demonstrating the pressing need to educate and care for these women.

6.2 RECOMMENDATIONS

Recommendations for government

- The high prevalence of urinary incontinence among women in Kigali, and the need to address the problem of different physiotherapy is for intervention programmes need to be addressed. Evidence shows that incontinence can have a devastating effect on the quality of life of sufferers and can cost the nation enormous amounts.

- The Rwandan government should be encouraged to take an interest in and to support the development of continence services by developing an active planning policy. This should include a prevention strategy such as health promotion and health education. Family planning as a health policy must be implemented to reduce the risk of UI.

- Continence should be a compulsory subject for all medical, nursing, and physiotherapy curriculae.

- An increased degree of awareness, both in the female population and among health professionals on urinary incontinence should be promoted. This will go further in assisting to break down taboos and to empower health-seeking behaviour.

- The formation of a national continence organisation is fundamental in order to provide the focal point for development of comprehensive continence services. This organisation should provide the structure for

partnerships between sufferers, health care professionals and the institutions, for example hospitals.

- Public health programmes should provide information to all women, and strategies for prevention and treatment should be implemented, especially in the younger population.

Recommendations for research

- Collaborative research between clinicians and basic scientists should be encouraged. International collaboration is also essential in order to build up a database

- It is highly recommended that validated measures of quality of life and symptoms of urinary incontinence should be included in research.

- Clinical research and epidemiological studies must be encouraged.

- A longitudinal study should be encouraged in order to provide more information regarding the instruments to measure health related quality of life in incontinent women.

- The use of a number of validated questionnaires is recommended for a more detailed assessment of the symptoms of incontinence and their impact on quality of life.

Recommendation for health professionals

- Establishing the prevalence is the first step in the development of a public health strategy for the management of UI in the community. Different types of urinary incontinence must be identified by initial continence assessment.

- Health promotion programmes as well as life style intervention (which includes weight reduction, stopping smoking, fluid intake, regulating food) in addition to therapies must be included in the initial treatment.

- Prophylaxis should be provided against the occurrence of UI, for example pelvic floor exercise classes for women especially during the perinatal period in order to reduce possible urinary incontinence in the future.

- Physiotherapy management of urinary incontinence like pelvic floor muscle training must be encouraged.

- All women should undertake a prescribed programme of pelvic floor rehabilitation exercises after childbirth irrespective of lack of symptoms of UI.

- It is important to increase the competence of the doctor who first sees the patient and also the staff/ physiotherapists working or assisting this doctor.

- There is a need to educate health professionals and Physiotherapists within Primary Health Care in different districts, therefore, disseminating knowledge about UI and its management.

6.3 LIMITATIONS OF THE STUDY

This study is not free from limitations, which affects the generalisation of the findings.

- The study population consisted only of women in the general population in Kigali city, not men and elderly women over 65 years. In addition, because no data on pre-existing conditions for the participants existed, the lack of epidemiological study and the lack of a clinical history of women with UI, the prevalence rates in this study may not be considered as representative of the Rwandan population neither can they be generalised to the population.

- Some women, especially those with a higher level of education were frequently reluctant to discuss urinary incontinence and especially whether it occurred with sexual intercourse. It should however, be pointed out that this could be associated with cultural taboos in Rwanda as issues of sexual intercourse are considered sensitive and not discussed in public.

- Another limitation is that data was collected with a questionnaire and no medical investigations or assessment of UI was done. Quality of life was also only self-reported and no assessed.

- Since the questionnaires used in the study were adapted, reliability was not established.

6.4 CONCLUSION

A total of 42% of our sampled respondents experienced urinary incontinence in varying degrees. It seems plausible, therefore, that urinary incontinence amongst Kigali women may be considered as being more prevalent or a major concern like the other chronic diseases such as HIV/Aids, coronary artery disease and diabetes. We found a number of social demographic factors, which predispose Rwandan women to developing UI, and these should be addressed before initiating treatment for UI. Age is therefore a predisposing risk factor a risk of UI. Even though prevalence increased with age, UI is never normal and it remains treatable regardless of age. Parity is also a very strong determinant of the predisposition of UI. Finally, UI is a symptom, which decreases a person's overall quality of life many lives. Assessing the quality of life as a whole is important in the field of promoting continence, rehabilitation and physiotherapy management.

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APPENDICES

Appendix A: Letter from the ethics and research committee of the University of the Western Cape.

Appendix B: Letter to the Rwandan Minister of Health

Appendix C: Letter to the Minister of gender and women promotion.

Appendix D: Letter to the Mayer of Kigali city.

Appendix E: Letter of permission from the Rwandan Minister of Health

Appendix F: Letter of permission from the Mayer of Kigali

Appendix G: Letter to respondents.

Appendix H: The resident population in the Kigali districts

Appendix I: Questionnaire in English

Appendix J: Questionnaire in Kinyarwanda

Appendix K: Questionnaire in French

Appendix L: Map of Kigali city