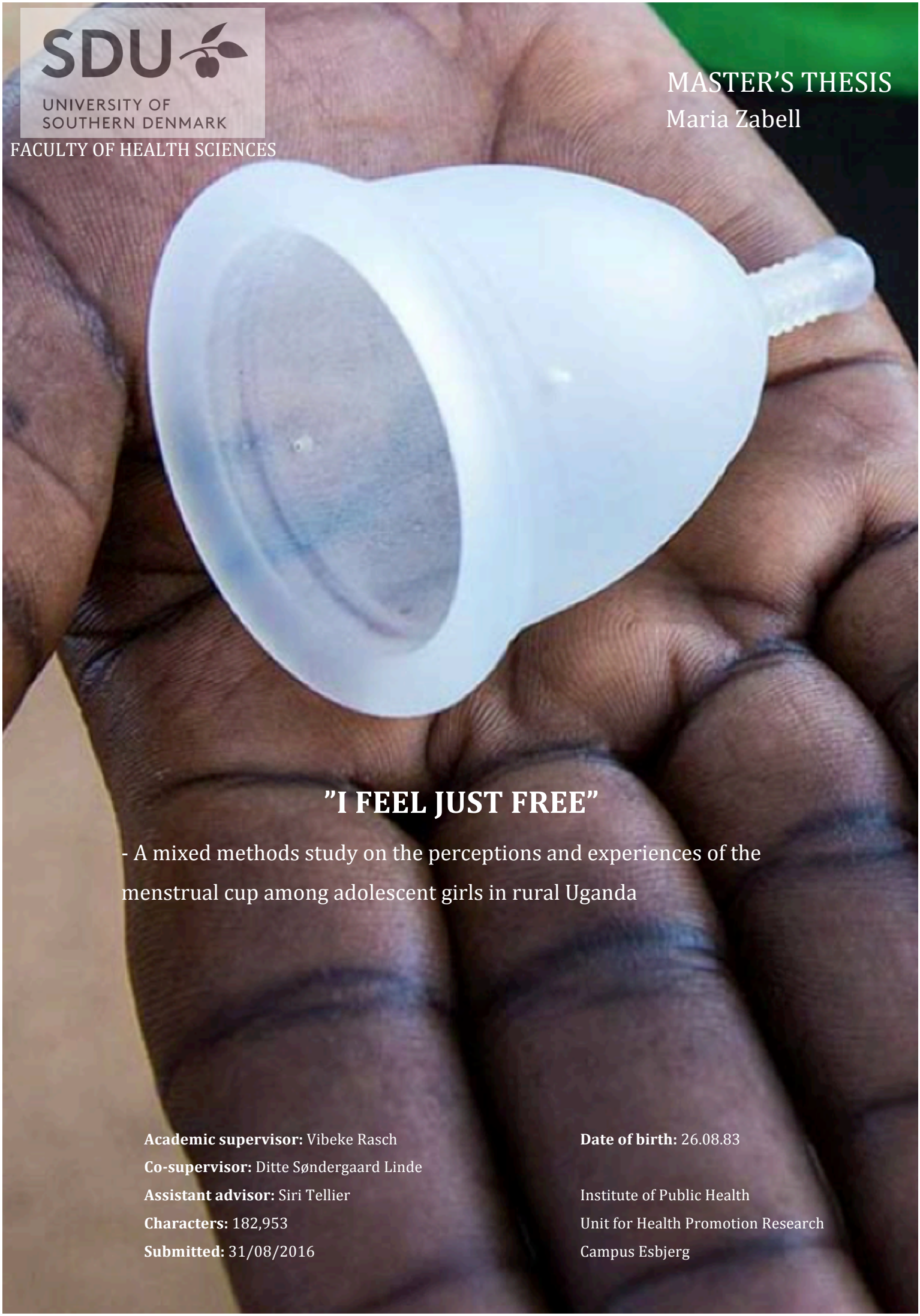

UNIVERSITY OF SOUTHERN DENMARK
FACULTY OF HEALTH SCIENCES

MASTER'S THESIS

Maria Zabell

"I FEEL JUST FREE"

- A mixed methods study on the perceptions and experiences of the menstrual cup among adolescent girls in rural Uganda

Academic supervisor: Vibeke Rasch
Co-supervisor: Ditte Søndergaard Linde
Assistant advisor: Siri Tellier
Characters: 182,953
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Date of birth: 26.08.83

Institute of Public Health
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FACULTY OF HEALTH SCIENCES
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”I FEEL JUST FREE”

A MIXED METHODS STUDY ON THE PERCEPTIONS AND EXPERIENCES OF THE MENSTRUAL CUP AMONG ADOLESCENT GIRLS IN RURAL UGANDA

MASTER’S THESIS IN PUBLIC HEALTH

MARIA ZABELL

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Danish title:

”Jeg føler mig bare fri” – Et mixed methods studie om perception af og erfaring med menstruationskoppen blandt unge piger i rurale Uganda

ABSTRACT

INTRODUCTION: Menstrual Health and Management (MHM) is a rising topic within the field of Sexual and Reproductive Health (SRH) research. Lack of access to menstrual management methods and sanitary facilities have an impact on the MHM for adolescent girls and women in Low- and Middle-Income Countries (LMICs). This study aims to investigate the impacts of poor MHM on adolescent girls in Sub-Saharan Africa (SSA) and to evaluate if the Menstrual Cup (MC) is an accepted menstrual management method among rural adolescent Ugandan girls.

METHODS: A systematic literature search was conducted and a total of 100 structured questionnaires and 10 semi-structured interviews were collected in two sites in rural northern and eastern Uganda. Study participants were adolescent girls in the ages 13-21 years. The questionnaire responses were univariate and bivariate analyzed while a QCA was carried out on the semi-structured interviews.

RESULTS: Adolescent girls are impacted by poor MHM in various ways, such as shame from or fear of leakage, school absenteeism, low spatial mobility, and lack of empowerment. Keeping the menstrual status hidden from the community, especially boys and men, is considered good 'menstrual etiquette'. The MC is an accepted menstrual management method, still used more than two years after being distributed in Uganda. However, the different cultural beliefs surrounding the two sites might affect the overall acceptance of the MC. It does however increase the girls' spatial mobility, school attendance, and feeling of freedom.

DISCUSSION: Girls in rural Uganda are challenged every month by their menstruation. Lacking proper and dignified MHM, they become vulnerable to shame and constant worrying, which affects their concentration in school among other things. Having the MC makes it easier for the girls to behave as they normally do, feeling free and not worrying about their menstruation. The MC presents itself as a sustainable menstrual management method that allows the girls to concentrate on developing and becoming empowered women.

KEY WORDS: Menstrual health and management, menstrual cup, perception, acceptance, adolescent girls, freedom, Uganda

DANISH SUMMARY

DANISH TITLE: "JEG FØLER MIG BARE FRI" – ET MIXED METHODS STUDIE OM PERCEPTION AF OG ERFARING MED MENSTRUATIONSKOPPEN BLANDT UNGE PIGER I RURALE UGANDA.

INTRODUKTION: Menstruel sundhed og håndtering af menstruation er et opblomstrende emne indenfor global seksuel og reproduktiv sundhed. Manglende adgang til menstruationsprodukter og sanitære faciliteter har en indvirkning på den menstruelle sundhed for piger og kvinder i lav- og middelindkomstlande. Dette studie undersøger indvirkningen af dårlig menstruel sundhed på unge piger syd for Sahara og evaluerer på menstruationskoppen som et accepteret menstruationsprodukt blandt unge piger to steder i rurale Uganda.

METODE: En systematisk litteratursøgning blev udført og sammenlagt 100 strukturerede spørgeskemaer og 10 semi-strukturerede interviews blev samlet i rurale Nord- og Østuganda. Studiedeltagerne var unge piger i alderen 13-21 år. Spørgeskemasvarene blev analyseret univariabelt og bivariabelt mens interviews blev analyseret med kvalitativ indholdsanalyse.

RESULTATER: Dårlig menstruel sundhed påvirker unge piger på flere forskellige måder, som for eksempel skam fra eller frygt for lækage, skolefravær, få fysiske bevægelsesmuligheder i samfundet og mangel på empowerment. At holde menstruationsstatus hemmelig fra samfundet, især drenge og mænd, er god 'menstruationsetikette'. Menstruationskoppen er et accepteret menstruations-produkt, der stadig bruges mere end to år efter den blev uddelt i Uganda. De forskellige kulturelle overbevisninger mellem de to steder kan dog påvirke accepten. Menstruationskoppen øger dog pigernes bevægelsesmuligheder, skolegang og følelse af frihed.

DISKUSSION: Piger i rurale Uganda er udfordret af deres menstruation hver måned. Manglende adgang til ordentlig menstruel sundhed og menstruationsprodukter gør dem sårbare gør skam og konstant bekymring, hvilket blandt andet påvirker deres koncentration i skolen. Menstruationskoppen gør det nemmere for pigerne at leve som de normalt gør, med en følelse af frihed og uden bekymring for menstruation. Menstruationskoppen præsenterer sig selv som et stabilt menstruationsprodukt, der tillader at pigerne koncentrerer sig om at udvikle sig og blive kvinder med empowerment.

NØGEORD: Menstruation, sundhed, menstruationskop, perception, accept, teenagepiger, frihed, Uganda

PREFACE

On November 13 2015 I went to the annual meeting in the Danish association for public health, FFSV. Given the FFSV-award for doing an extraordinary effort in the field of public health, was the Danish NGO, WoMena. Standing on the brink of writing my master's thesis, I needed a topic and there it was; reproductive health issues in low-income settings. My interest for global public health, development and reproductive health was merged beautifully together.
Less than six months later, I found myself in a hot bus on the dusty road from Kampala to Gulu to do research for my master's thesis as an intern for WoMena. With me I had a Swedish master's student and a Ugandan WoMena volunteer, both of whom I had only met days before. Ahead of us were three weeks of hard work, sunburn, posho and beans, confusion and frustration, steep learning curves, incredible people, and heartfelt laughs.

This thesis is the result of the research conducted in northern Uganda and concludes my master's education in public health at the University of Southern Denmark. It would not have been completed without the tireless and talented guidance from Ditte Søndergaard Linde, my valued supervisor, who made me strive for the stars and who managed me and my, at times, fumbled process perfectly. I want to thank professor Vibeke Rasch, for taking me under her skilled wings, and assistant advisor Siri Tellier, whose positive and engaged energy in my work and the field of reproductive health is contagious and admirable.
I also want to thank WoMena for providing the data for this thesis and for giving me an opportunity to learn and develop in the settings of Sub-Saharan Africa. I owe a big thanks to all my extraordinary WoMena colleagues who always provide new insight and perspective.

Finally, I want to give a special thanks to all the girls who participated. Their vulnerable honesty helped complete this thesis.

Maria Zabell

Faculty of Health Sciences, University of Southern Denmark, August 2016

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ACRONYMS AND ABBREVIATIONS

CI:	Confidence Interval
DCA:	DanChurchAid
HIC:	High-Income Country
ICPD:	International Conference on Population and Development
LIC:	Low-Income Country
LMIC:	Low- and Middle-Income Country
MC:	Menstrual Cup
MCI:	Menstrual Cup Intervention
MCIFUS:	Menstrual Cup Interventions Follow-Up Study
MCIS:	Menstrual Cup Intervention Study
MHM:	Menstrual Health and Management
NGO:	Non-Governmental Organisation
OR:	Odds Ratio
QCA:	Qualitative Content Analysis
RA:	Research Assistant
SRH:	Sexual and Reproductive Health
SSA:	Sub-Saharan Africa
TPO:	Transcultural Psychosocial Organisation
UNCST:	Uganda National Council for Science and Technology
URCS:	Uganda Red Cross Society
VHT:	Village Health Team
WASH:	Water, Sanitation, and Hygiene

OPERATIONAL DEFINITIONS

Informant

In this thesis, an informant is a girl participating in a semi-structured interview conducted for the study.

Menstrual Health and Management (MHM)

A term increasingly used in the research field. It covers issues related to conducting proper and dignified management when menstruating, including knowing about the healthy menstrual cycle. Easily confused with menstrual hygiene management, which is commonly used in the research field. In this thesis, the term MHM is preferred, as it best covers all the aspects of menstrual challenges faced by girls and women worldwide, especially in low- and middle-income countries.

Menstrual hygiene management

A term commonly used in the research field to explain the management of menstrual hygiene and the challenges to achieve it properly. The term is not preferred in this thesis, as it is considered too narrow, excluding to some extent menstrual health.

Menstrual management method

A method to manage menstruation. The term consists of common sanitary products, as well as improper methods, such as leafs, bark or old rags.

Respondent

In this thesis, a respondent refers to a girl participating in the survey questionnaire conducted for the study.

1.0 INTRODUCTION

This thesis is structured according to the IMRAD-format (Sollaci & Pereira 2004) and therefore has four main chapters: Introduction, Materials and Methods, Results, and Discussion.

This chapter introduces themes relevant to the focus of this thesis in the following order: Menstrual health as a public health issue, Sexual and Reproductive Health, Menstrual Health and Management: what we know, and finally the menstrual cup and WoMena. Then the research proposal is presented, followed by the preliminary understanding of the research field. Finally, an outline of what this thesis may add to the research field is presented.

1.1 MENSTRUAL HEALTH AS A PUBLIC HEALTH ISSUE

Menstruation is a reoccurring event for a quarter of the world's population (Phillips-Howard et al. 2015). This corresponds to more than 1,8 billion women of reproductive age (US Census Bureau 2016). Like respiration, pulse, temperature, and blood pressure, menstruation tells a story of a woman's overall health (Hillard 2014). However, knowledge about menarche (the onset of menstruation), the healthy menstrual cycle, and Sexual and Reproductive Health (SRH) education, including puberty and Menstrual Health and Management (MHM) education, remains scarce among adolescent girls (and boys), especially in Low- and Middle-Income Countries (LMICs) (Sommer, Hirsch, et al. 2015; UNESCO 2014). Knowledge about SRH, the menstrual cycle, and how to manage menstruation is valuable information that potentially can help girls and women take control over their bodies and their futures by staying in school, avoiding infections as well as early, unwanted pregnancies.

In the past decades, MHM has received little attention on the global public health agenda (Sommer, Hirsch, et al. 2015). Originated in the growing global concern for gender inequity, the educational and the Water, Sanitation, and Hygiene (WASH) sectors have started advocating for improved sanitary and hygienic facilities in order to keep girls in school (Sommer, Hirsch, et al. 2015). The public health sector became engaged in the multi-facetted challenge that is MHM due to the fact that improvement of girls' education can improve the overall population health (Sommer, Hirsch, et al. 2015; Caldwell 1994). This was additionally spurred on by the 2014 UNESCO Puberty Education & Menstrual Hygiene Management booklet, that among other things, suggests accurate and timely knowledge, sanitation and washing facilities, and referral and access to health services (UNESCO 2014). All areas that could possibly benefit from a public health approach.

According to Sommer et al., a reason for the lack of focus on MHM could be that menstruation has been surrounded with secrecy in both high- and low-income countries and girls have been taught a 'menstrual etiquette' to adhere to after

menarche (Sommer, Hirsch, et al. 2015). This etiquette recommends discreet management of menstruation, which indirectly teaches the girls the importance of keeping their status as a menstruating woman hidden from boys and men. This secret is easier kept in High-Income Countries (HICs) where puberty guidance, sanitary materials, and clean, private facilities to manage menstruation are available (Sommer, Hirsch, et al. 2015). Menstruation is also very often perceived as a personal issue to be handled by the individual and her family. Unfortunately, this has caused generations of girls being provided with limited knowledge about menarche and menstruation as well as improper sanitary materials (Sommer, Hirsch, et al. 2015).

Another factor to add to the lack of focus on MHM, is that the majority of LMIC governments have lacked women in leadership positions to advocate for tabooed issues such as menstruation and MHM (Sommer, Hirsch, et al. 2015). This has led to a lack of focus on the issue of SRH education in general, and MHM in particular.

Within recent years, research has emerged from multiple partners in the educational, WASH, and public health sectors and implementation strategies and intervention studies for improved MHM keep rising to the surface. This includes increased focus on the importance of SRH education for both girls and boys. Furthermore, governments in LMICs are starting to recognise the challenge of MHM and are more frequently addressing the issue of menstruation through policies for example in Kenya, efforts have been launched to subsidise taxation on sanitary products (Sommer, Hirsch, et al. 2015). Still, MHM remains an up and coming field within SRH and will need increased focus moving forward.

1.2 SEXUAL AND REPRODUCTIVE HEALTH

As described above, the issues of menstruation and menstrual health are global public health topics that lie within the field of SRH. On the global scene, SRH is a controversial area that has received increased attention over past two decades, partly due to the ground-breaking first International Conference on Population and Development (ICPD) that was held in Cairo, Egypt in 1994. There, delegates from 179 states finalised the Programme of Action (PoA) (ICPD 2012) and defined reproductive health as:

> "*… not merely the absence of disease or infirmity, in all matters relating to the reproductive system and its functions and processes. Reproductive health […] implies that people are able to have a satisfying and safe sex life and that they have the capability to reproduce and the freedom to decide if, when and how often to do so*" (UNFPA 2014b, p.58)

The conference was in many ways ground-breaking for the issue of SRH and emphasised women's rights and the need to reduce the inequity in health between men and women (ICPD 2012; UNFPA 2014a). According to ICPD, there is a clear connection between reproductive health, human rights and sustainable development.

The eight UN Millennium Development Goals (MDGs) addressed reproductive health in MDG number five: *Improve Maternal Health*, specifically in target 5.B: *'Achieve, by 2015, universal access to reproductive health'*[1] (United Nations 2008). However, the MDG 5 was part of the unfinished agenda for the post-2015 period (United Nations 2015b). In 2015, the UN replaced the eight MDGs with the 17 Sustainable Development Goals (SDGs) that are to be reached by 2030. One of the 17 SDGs addresses reproductive health in a target, namely the SGD number three: *Good Health and Well-Being*, target 3.7:

> *'By 2030, ensure universal access to sexual and reproductive health-care services, including family planning, information and education, and the integration of reproductive health into national strategies and programmes'* (United Nations 2015a)

[1] Target 5.b was not included in the MDGs originally, but added later in the process. This received some critique.

The SDG targets also include reducing maternal deaths, including antenatal care, all SRH topics (United Nations 2015a).

SRH refers to a range of different topics such as abortion, maternal and perinatal health, violence against women, and female genital mutilation to name a few (WHO 2016). Worldwide, SRH issues leads to female and child mortality and morbidity due to pregnancy-related issues, Sexual Transmitted Infections (STIs) including HIV/AIDS, unsafe abortions, etc. As SRH include a variety of topics, standardised figures on the epidemiology of SRH are difficult to access. However, in 2004, WHO estimated that reproductive ill health accounted for 18% of the total global burden of disease (Working Group on Sexual and Reproductive Health and Rights 2015). In 2014, the Guttmacher Institute estimated the number of maternal deaths alone to be almost 291,000 globally and of these deaths, more than 178,000 happened in Sub-Saharan Africa (SSA) (Guttmacher Institute 2014). As MHM is an upcoming topic with SRH, global estimates of the consequences of poor MHM are still scarce. In the following section, definitions and knowledge within MHM are outlined.

1.3 MENSTRUAL HEALTH AND MANAGEMENT: WHAT WE KNOW

There is a knowledge gap when it comes to the understanding of the impact of menstruation on especially adolescent girls (Sommer et al. 2016).

The Joint Monitoring Programme (JMP) of WHO and UNICEF refers to MHM as adolescent girls and women's understanding of the basic facts of the menstrual cycle and how to manage it without discomfort or fear, and with dignity. Also, it refers to girls and women using clean menstrual management material to absorb or collect menstrual fluid and having access to safe and convenient facilities to wash the body and/or dispose of the used menstrual management material (UNESCO 2014).

In most HICs, access to menstrual management materials is easy, affordable, and a matter of course for the majority of girls and women. Women's movements may have eased the ground in relation to gender equality and menstruation during the 20th century in most HICs. However, menstruation is generally still tabooed and girls and women around the world are hide their menstrual status and avoiding the topic. In some cultures and societies girls and women are even considered to be unclean during their menstruation (Christensen & Laub 2016; Sommer 2010b). Socio-cultural restrictions can entail that girls and women are not allowed to e.g. enter a praying room, look into a mirror, attend to guests, or touch holy books (Ranabhat et al. 2015). In Nepal, the Chhaupadi culture dictates that menstruating women are not allowed to consume dairy products, have restricted access to water sources, and are not allowed to touch men, children, fruit bearing trees, or cattle. Furthermore, they have to sleep outside the home, as e.g. in a cowshed (Ranabhat et al. 2015).

In SSA, menstruation is a highly stigmatised topic, and an unknown number of girls and women lack access to appropriate menstrual management methods that are effective, comfortable, convenient, affordable, and safe to use (Sommer 2010a; Sommer et al. 2016; Sommer & Sahin 2013). Furthermore, this often leads to girls and women using methods of poor quality, such as tissue paper, sanitary napkins,

strips of cloth, bark cloth, etc. Being unable to access proper menstrual management methods carries the potential risk of infections. This can impact the social, physical, and mental well-being of the girls and women as well as increase adolescent girls' vulnerability to coercive sex and the risk of girls engaging in transactional sex to obtain sanitary products or money to buy them (Mason et al. 2015; Acharya et al. 2006; Khanna et al. 2005; Tellier et al. 2012; Sommer et al. 2016; Phillips-Howard et al. 2015). Inappropriate or insufficient menstrual management has also been associated with school absence and exclusion from or reduced participation in income-generating and social activities (Sidze & Wawire 2013; Sommer et al. 2016).

Unfortunately, no validated numbers exist on the true number of girls and women affected by the lack of proper MHM. It is expected that the majority of girls and women lacking proper MHM live in the least developed countries in the world. In 2015, more than 231 million girls and women in the age of 15-49 were estimated to live here. Of these, more than 88 million lived in Eastern Africa (US Census Bureau 2016). Uganda is a Low-Income Country (LIC) in Eastern Africa, bordered by South Sudan, Tanzania, Kenya, and Democratic Republic of the Congo (see appendix I). In 2015, 8.3 million of the 37 million people living in Uganda were girls and women in the age 15-49 years (US Census Bureau 2016) and thus, expected to be affected by the menstrual challenges outlined above.

As mentioned, numerous scholars and NGOs in the field of reproductive health are increasingly focusing on MHM and how to meet the needs of the girls and women in LMICs (Sommer, Hirsch, et al. 2015). Several interventions have been applied to help girls and women access sanitary products, including the development of accessible sustainable sanitary methods, such as MakaPads or AFRIpads [2] (Sommer, Hirsch, et al. 2015; AFRIpads 2016; Technology for Tomorrow 2016). Furthermore, other sustainable sanitary products have reached the global market

[2] MakaPads are disposable pads made from papyrus and paper waste, it is 95% biodegradable, and produced locally in Uganda (Technology for Tomorrow 2016). AFRIpads are reusable pads that can be washed and reused. AFRIpads lasts for 12+ months (AFRIpads 2016). There are several reusable pad brands available.

in recent years, i.e. the menstrual cup, and implementation and intervention studies are slowly emerging in peer-reviewed journals.

In Uganda, governmental focus on MHM and SRH education has been established, as the Ugandan Ministry of Education, Science, Technology, and Sports committed to the Menstrual Hygiene Management Charter in 2015, (Government of Uganda 2015). Among other things, the charter resolves to politically consider menstrual health as a part of the SDGs to be met and

> *'to empower both boys and girls to understand and appreciate menstruation and manage the social and practical challenges associated with menstrual hygiene'*
> (Government of Uganda 2015, p.2)

Additionally, the charter urged the government to establish a National Menstrual Hygiene Management Steering Committee, which it did. The committee is working with NGOs and private partners in Uganda to ensure proper and dignified MHM for girls and women.

1.4 THE MENSTRUAL CUP AND WOMENA

The following section describes the Menstrual Cup (MC) as a sustainable menstrual management method. Furthermore, a description of a Danish Non-Governmental Organisation (NGO) WoMena that works with SRH and the MC in Eastern Africa, is presented.

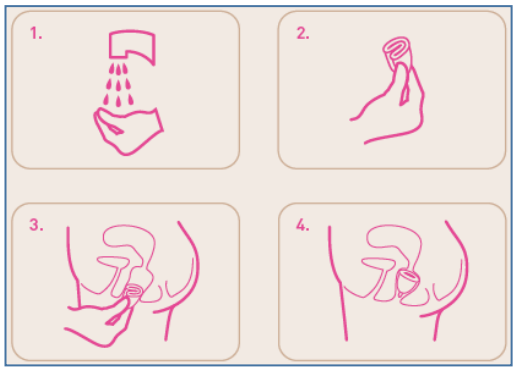
1.4.1 THE MENSTRUAL CUP

The MC is not a recent intervention though the extension of knowledge on the MC among women remains little. The first modern MCs were made of latex rubber and introduced in the late 1930s in America. Most women then were uncomfortable with emptying and cleaning the MC and it failed to be acknowledged as a menstrual management tool (Lunette 2015). However, the overall wish to live more sustainably within HICs has raised the awareness and usage of the MC over the past decade. Additionally, this has led to the belief that the MC can help assess some of the menstrual management challenges faced by girls and women in LICs.

The MC collects menstrual fluid and is worn inside the vagina during menstruation, see picture 1.1. It is a flexible, bell-shaped cup and most often made of medical silicone and can be washed, sterilised, and reused for up to ten years. Collecting three times as much fluid as the average tampon can absorb, and having a lesser risk of leakage, if used correctly, the MC has the potential of being an effective, reusable, and environmentally sustainable alternative to disposable sanitary products (Cheng et al. 1995). Depending on the menstrual flow, the MC needs to be emptied every 4-8 hours and should be sterilized after each menstruation period (Ruby Cup 2015).

PICTURE 1.1: LEFT: A Menstrual Cup (Tom Saater & WoMena 2014)

RIGHT: How To Insert The Menstrual Cup (Ruby Cup 2016)



The MC is folded before inserted into the vagina where it will unfold automatically and create a light seal against the vaginal walls (Ruby Cup 2015). When used correctly, the MC is safe to use and research, i.e. on the safety of the MC, has been conducted within recent years regarding potential health risks. So far, research has not identified any health risks related to the use of MCs (North & Oldham 2011a; Howard et al. 2011). Assuming that the cup can be kept for use for 5-10 years and is sold at approximately USD 8-21, the direct annual costs are only between USD 1-2.7. Therefore, the MC is increasingly being considered a cost-effective way to improve the menstrual management of girls and women in LICs (Cheng et al. 1995; North & Oldham 2011a; Stewart & Spencer 2002; Wiebe & Trouton 2012; Howard et al. 2011).

At this point, there are no documented figures on how many girls and women are using the MC worldwide. Through personal mail correspondences with the American non-profit organisation Program for Appropriate Technology in Health (PATH) who advocate for implementation of health technologies, especially in LMICs, awareness was given to a still unpublished user survey conducted by PATH on this issue. The survey estimates that the MC is used in more than 37 countries worldwide (PATH, unpublished work). Furthermore, estimates on the number of donated MCs were given through correspondences with the MC producer, distributer, and WoMena partner, Ruby Life Ltd.. According to Ruby Life Ltd., they

have donated more than 17,000 MCs to girls and women in Kenya and Uganda alone over a period of five years[3].

Even though there is limited evidence on the potential use, acceptability, and hygienic safety of MCs in low-income settings, awareness is increasing (African Population and Health Reseach Center 2010; Beksinska et al. 2015a; Mason et al. 2015; Tellier et al. 2012). Available evidence from a MC trial in urban and peri-urban Nepal (Oster & Thornton 2011; Oster & Thornton 2009) and a pilot study in rural Uganda (Tellier et al. 2012) suggest that there is a low risk of urinary tract infections and reproductive tract infections associated with the use of MCs in low-income settings. Furthermore, studies from HICs show that the MC is accepted and widely considered a safe, comfortable, and sustainable menstrual management method (Howard et al. 2011; Stewart et al. 2010; North & Oldham 2011a; Cheng et al. 1995).

1.4.2 WOMENA

WoMena is a young Danish NGO founded in 2012. The main focus is to ensure that SRH research is systematically applied and that evidence-based, effective, SRH technologies and innovative solutions are explored and supported (WoMena 2015a). WoMena's strategies are focused on menstrual hygiene and menstrual management, more specifically the MC. Currently, the NGO is involved in several projects, mainly in Uganda, on improving the knowledge of menstruation, MHM, and SRH among adolescents (WoMena 2015c).

In 2012, WoMena initiated a pilot study on implementation of the MC in rural northern Uganda. WoMena since followed it up with studies in 2013 and 2014 in Gulu, northern Uganda and Katakwi, eastern Uganda[4]. To evaluate the current usage and perception of the MC in these three settings, WoMena conducted a follow-up study in 2015 and 2016. This study will derive data from this overall WoMena follow-up study (see chapter 2).

[3] Ruby Cup sells the MC under the motto *"Buy One, Give One"*, meaning that they donate one MC to a girl in a low-income country for every MC they sell. The distribution of the donated MCs is undertaken by several partners, including Danish NGO WoMena.
[4] A map of Uganda and the setting of the study will be presented in chapter 2, section 2.3.2.

1.5 RESEARCH PROPOSAL

This section presents the rationale of the study and the research questions for this thesis.

1.5.1 RATIONALE

Poor MHM in LMICs has been an overlooked field in global public health, especially in SRH, for decades. However scarce, rising research and evidence in the field of MHM suggest, among other things, that impacts of poor MHM issues promote gender inequality and add unnecessary health risks to girls and women in these countries. A hypothesis is, that having access to proper menstrual management methods, such as the MC, could potentially empower the girls and women and break down a barrier to achieve gender equality and improved SRH.

Thus, the scope of this thesis is to understand the impacts of poor MHM and to evaluate if the MC is an accepted menstrual management method among rural adolescent Ugandan girls.

1.5.2 RESEARCH QUESTIONS

Specifically, this thesis aims to investigate the following:

1. *What is the current scientific evidence on the impacts of poor menstrual health and management on adolescent schoolgirls in Sub-Saharan Africa?*

2. *How has the menstrual cup overall been accepted and used among adolescent Ugandan girls in Gulu and Katakwi?*

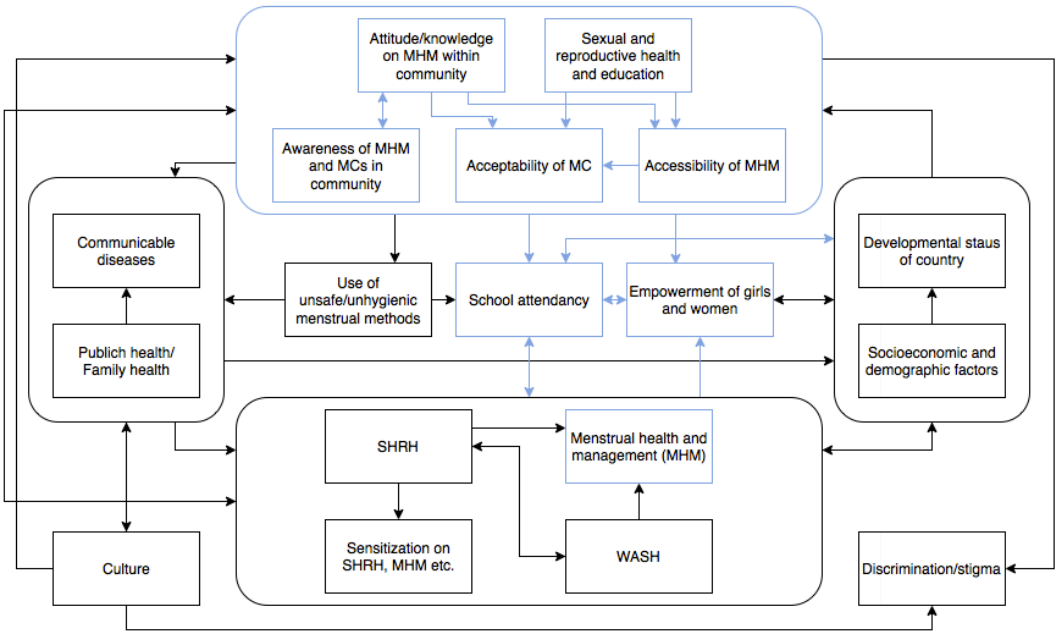
3. *How do adolescent Ugandan girls in Gulu and Katakwi perceive menstrual health and management and what are their experiences with the menstrual cup?*

1.6 PRELIMINARY UNDERSTANDING OF RESEARCH FIELD

In this section, the preliminary understanding of the research field is presented.

The following figure 1.1 displays the different factors and their association to the research field.

FIGURE 1.1: PRELIMINARY UNDERSTANDING OF RESEARCH FIELD



The boxes lined in blue illustrate the factors related to this study while the boxes in black illustrate factors related to the overall research field. However, they are not addressed, as they do not relate to the scope of this study. In the following, the understanding of the boxes in blue will be elaborated.

The boxes are interrelated on several levels: international, national, governmental, community, and personal level. The boxes in the middle of the figure are the essential factors that (im)proper MHM have the ability to lead to. The boxes in the sides are factors at the international, national, or governmental levels. *Culture* and *Discrimination/stigma* are factors at community and personal levels while the

boxes at the top and bottom are the factors related to increasing SRH in general and menstrual health in particular.

The entrance point to the research field is improving MHM within low-income settings. Having menstrual management methods like the MC is key to achieving dignified menstrual management and achieving this includes several interrelated factors. Overall, MHM needs to be in focus through SRH education. The attitude and knowledge about MHM within communities along with SRH education are considered main factors to achieve increased menstrual health. This means that the awareness of MHM and the MC is needed in the communities, as well as both being accessible and accepted. This has a potential to keep girls in school during their menstruation leading to a decreased dropout rate. An increase in girls finishing school can lead to a rise in the overall developmental status of Uganda through socioeconomic factors, because the girls increase their level of education, increase their level of employment, and increase the income of their future families and communities.

Of course, reality is more complex than outlined above and the arrows are meant as an indication of the relationship between the different factors more than a causal link. Furthermore, no timeline appears in the figure, as the different factors' placement time-wise can be discussed. Subject to these reservations, the figure can be seen as a tool to expose the underlying understanding of the research field prior to the study.

1.7 WHAT THIS THESIS MAY ADD TO THE RESEARCH FIELD

This thesis aims at providing a new perspective to the challenges faced by adolescent girls and women in a low-income setting like rural Uganda when it comes to MHM. Only limited research exists within the field of menstrual health, especially related to the MC, which makes this thesis an illustration of the acceptance and perception of the MC. The advantages of this study include the fact that the MC was distributed more than one to three years ago, thus adding on the time aspect. If the MC has become an integrated part of the menstrual management in the communities there is a chance, that this can be achieved in other settings and in other LMICs.

This thesis is considered to be able to add another piece to the puzzle on understanding MHM, and the uses of available menstrual management methods in low-income settings to better understand the challenges of menstruation and the possibilities of sustainable menstrual management methods. Furthermore, this thesis can hopefully provide important knowledge on the perception and acceptability of new menstrual management methods like the MCs, and help enlighten some of the many complex factors that are related to MHM in low-income settings.

2.0 MATERIALS AND METHODS

This chapter presents the materials and methods of the thesis.
Firstly, the literature search is described. Secondly, the data material used for this thesis is outlined, as it was derived from an on-going comprehensive study. Thirdly, an introduction to the research methods used is provided, including the study design and study setting. Fourthly, the quantitative and qualitative research methods are outlined. Finally, the ethical considerations for this thesis are explained.

2.1 LITERATURE SEARCH

In order to investigate research question 1[5] and to explore and clarify the field of interest including identification of the latest peer-reviewed literature, a literature search was carried out in the period May-June 2016.

2.1.1 SYSTEMATIC PEER-REVIEWED LITERATURE SEARCH

A systematic literature search was conducted in June 2016 (for search history see appendix IV). The following search-engines were searched for articles from peer-reviewed journals: PubMed, PsychINFO, Cochrane[6], Popline, Web of Science, and Scopus. The search was made according to the PICO-scheme (see table 2.1). The PICO-scheme helps to structure the systematic search through focusing the population (*P*), the intervention (*I*) to be explored, the alternative intervention or control (*C*), and finally, the outcome (*O*) to which evidence is sought (Higgins et al. 2008a). Relevant search terms were found using the MeSH term's search engine in PubMed and using the Oxford Dictionary thesaurus. Each search engine was searched to extract all relevant literature from each of the search groups in table 2.2 and 2.3. Each search group's terms was searched using the Boolean operator *OR*. To ensure a comprehensive search, all the groups from table 2.2 were combined with only one of the groups in table 2.3 using the Boolean operator *AND.*

TABLE 2.1: PICO-SCHEME FOR SYSTEMATIC SEARCH

Population	Intervention	Control	Outcome
Schoolgirls Low- and middle-income countries (Sub-Saharan Africa) Sub-Saharan Africa 10-25 years old	Menstrual cup Menstrual management	Alternative menstrual hygiene product Nothing	Freedom Empowerment School attendance Improved hygiene Acceptability Improved menstrual health

[5] **1.** *What is the current scientific evidence on the impacts of poor MHM on adolescent schoolgirls in SSA?*

[6] No relevant articles were identified in the Cochrane Library.

TABLE 2.2: SEARCH GROUPS AND TERMS (INCLUDED IN ALL SEARCHES)

Group 1	Group 2	Group 3
Menstruation	Menstrual cup	Menstrual health
Menstr*	Menstrual hygiene product	Reproductive health
Period	Menstrual management	
Menstrual cycle	Menstrual hygiene	
	Feminine hygiene product	

TABLE 2.3: SEARCH GROUPS AND TERMS (ONLY ONE GROUP INCL. IN EACH SEARCH)

Group 4	Group 5	Group 6	Group 7
Freedom	Attendance	Integrate	Empower
Emancipation	Attend	Take	Empowerment
Independence	Presence	Accept	Enable
Liberty	Appearance	Acceptability	
	Showing	Adopt	
		Embrace	
		Welcome	

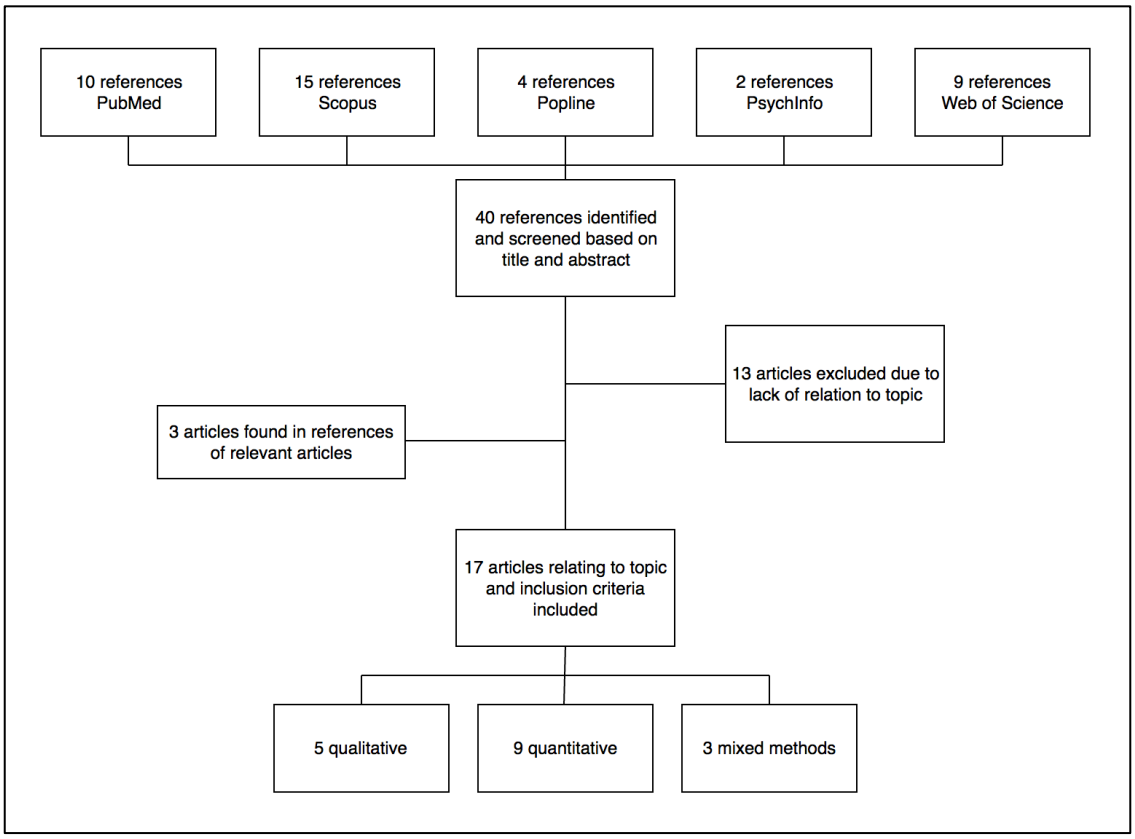
Inclusion criteria for the articles included that they should be: primary sources; published in 2005 or later; in English or translated into English; from LMICs in SSA; and address schoolgirls who have experienced menarche.

Forty articles were identified from the search engines. Of these, 13 were duplicates.

Thus, 27 articles were selected for further examination. From that, 14 articles were included (see figure 2.1).

Furthermore, a chained search was conducted from the relevant articles to identify relevant literature that had not been found through the search-engines. Three articles were included from the chained search.

FIGURE 2.1: FLOW CHART OF SYSTEMATIC SEARCH RESULTS



2.1.2 GREY LITERATURE

Grey literature, such as official reports and documents were identified, obtained, and chain searched through several media, such as e.g. websites of the World Bank, The Guttmacher Institute, WHO, UNFPA, UN Women, UNESCO, and UNICEF. Additionally, Danish, international and Ugandan newspapers, Google and Google Scholar, websites of Danish, international, and Ugandan NGOs, as well as blogs and other social media channels concerned with the field of SRH, menstruation, and the MC were searched for documents relating to this thesis.

Additionally, the literature database of WoMena was also accessed and investigated, as WoMena has collected comprehensive literature within the field of menstruation and MHM for several years. A great number of articles and reports were of importance to this thesis. In addition, several articles from the systematic literature search were also identified within the WoMena literature database.

2.2 BACKGROUND FOR THE METHODS IN THIS STUDY

This section outlines the background for the methods used for data collection in this study, as data was derived from an on-going study conducted by WoMena in Uganda.

2.2.1 WOMENA MENSTRUAL CUP INTERVENTIONS FOLLOW-UP STUDY

As mentioned, this thesis derives data material from a comprehensive WoMena study on MHM and MC use conducted in eastern and northern Uganda in 2015 and 2016. The study is named the Menstrual Cup Interventions Follow Up Study and will be abbreviated to MCIFUS.

2.2.1.1 BACKGROUND FOR CONDUCTING THE MCIFUS

To clarify the basis of the MCIFUS, the following briefly describes two Menstrual Cup Intervention Studies (MCISs) and a Menstrual Cup Intervention (MCI) carried out by WoMena and partners in 2012, 2013 and 2014 (see figure 2.2).

The MCISs consisted of training of the participating girls and women on the use of the MC. This also included SRH training as well as training on how to keep the MC clean and how to store it properly. The girls were all taken to a medical clinic for gynaecological examinations at baseline and, if needed, were provided with treatment for urinary or reproductive tract infections. This was done to be able to identify any possible infections related to using the MC at end line.

Three to five months after the training and distribution of the MCs, WoMena returned to the sites to obtain further information on the acceptability and perception of the usage of the MC and to provide support and further training if needed. All participants again underwent gynaecological examinations to assess and treat possible infections.

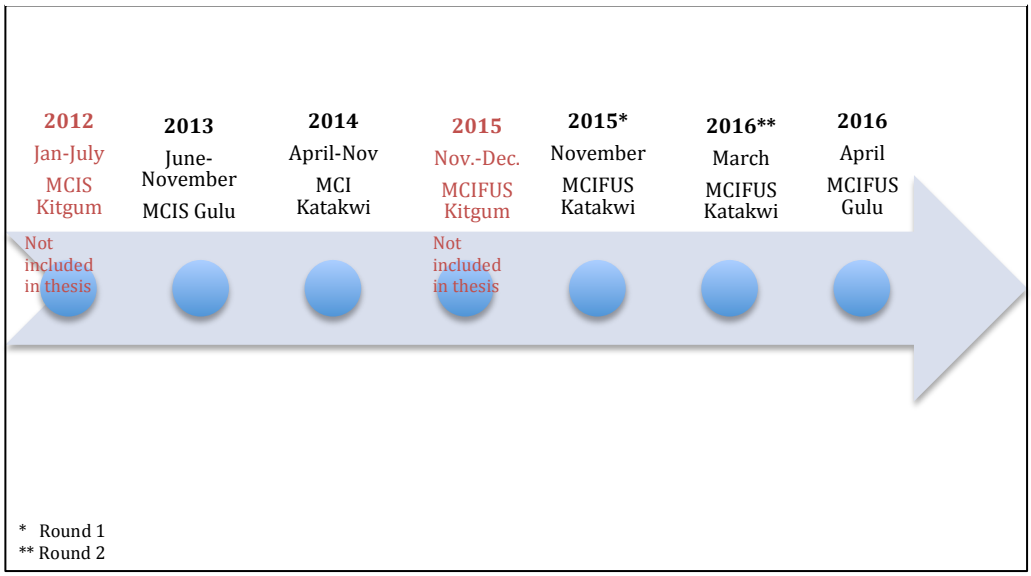
The first MCIS was a pilot study carried out in Kitgum town, Kitgum District in northern Uganda in 2012. Participants included only women who did not attend school, and were above the age of 18. The second MCIS in 2013 consisted of schoolgirls from three primary schools in Bungatira sub county, Gulu District also in northern Uganda. For Gulu, the participants were between the ages of 13-18 years.

The MCI consisted of SRH and MHM training combined with training on the use of the MC. The MCI was carried out in cooperation with DanChurchAid (DCA) and Transcultural Psychosocial Organisation (TPO). The MCI was carried out in 2014 in four schools in Magoro sub county, Katakwi District in eastern Uganda. In Katakwi, participants also included schoolgirls between in the ages of 13-18 years. DCA and TPO were responsible for the final training and distribution of the MCs with the help of senior woman teachers at the schools and were meant to finish in 2014. However, during the MCIFUS it was discovered that several girls did not receive the MC until 2015, which was more than six months later than planned and expected.

To assess the MC use among the girls and women one to three years after receiving it, WoMena decided to conduct the MCIFUS in all three sites. Data collection in Katakwi was carried out in two rounds due to the discovery of systematic errors in the data collected by two Research Assistants (RAs). Thus, a proportion of the data material was of too poor a quality and excluded from the analysis. WoMena decided to return to Katakwi to recollect the affected data in March 2016 (see figure 2.2). The excluded data concerned 45 questionnaires and two semi-structured interviews.

Data material for this study will be derived from the MCIFUS and only from Gulu and Katakwi, since the data from Kitgum include women out of school and is thus not relevant to this study.

FIGURE 2.2: TIMELINE OF MCIS AND MCIFUS



2.2.1.2 METHODS OF MCIFUS

To conduct the MCIFUS, a combination of different research methods were used:

- A structured questionnaire survey with both girls who continued and discontinued using the MC;
- Semi-structured interviews with both girls who continued and discontinued using the MC.
- Focus Group Discussions (FGDs) on community acceptance and impact of MC use from the teachers, the relatives, and the community leaders' perspective;
- Observations of menstrual management facilities accessible to the girls both in the primary schools and in the girls' private homes;

2.2.1.3 DELIMITATION OF DATA-USE

In order to explore the research questions of this study, only data from the structured questionnaire survey and the semi-structured interviews are included. All other data collected for the MCIFUS are excluded.

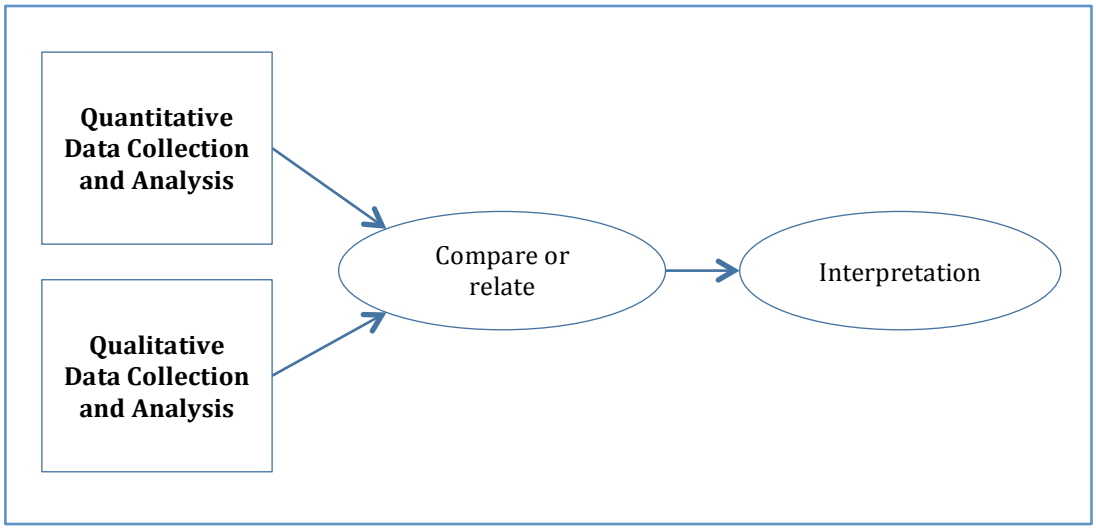
2.3 DESIGN AND STUDY SETTING

The following section describes the research design and the setting of this study.

2.3.1 RESEARCH DESIGN

The study design chosen was a mixed methods design. The mixed methods design is described by Creswell & Clark as a design where the researcher collects, analyses, mixes, and prioritises both qualitative and quantitative data (Creswell & Clark 2011). More specifically, the convergent parallel design was chosen for this study, see figure 2.3.

FIGURE 2.3: THE CONVERGENT PARALLEL DESIGN (Creswell & Clark 2011)



The convergent parallel design means that the researcher

> *"[...] uses concurrent timing to implement the quantitative and qualitative strands, during the same phase of the research process, prioritizes the methods equally, and keeps the strands independent during analysis and then mixes the results during the overall interpretation [...]"*
> (Creswell & Clark 2011, p.77)

In this study, the interaction level between the two strands of research (quantitative and qualitative) was independent, meaning that the research questions, data collection, and data analysis were kept separate from each other. Using concurrent timing means that both strands were implemented during a single phase of the study and equally prioritised in addressing the research

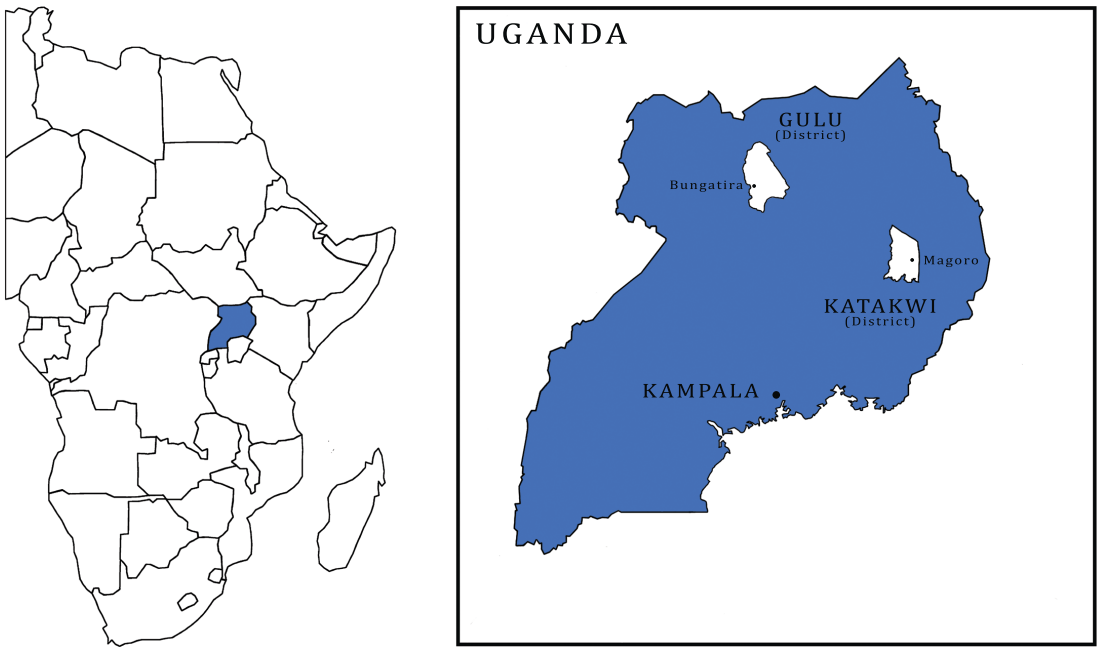
problem. Furthermore, the strands were mixed during the overall interpretation phase in the final step of the research process; the discussion (Creswell & Clark 2011).

The purpose of the convergent parallel design is *'to obtain different but complementary data on the same topic'* (Creswell & Clark 2011, p.77). This design was chosen because there was limited time for data collection and both qualitative and quantitative data needed to be collected during one field visit to each site. Furthermore, there was an equal value for collecting and analysing both types of data to better understand the problem (Creswell & Clark 2011).

2.3.2 STUDY SETTING

The study was conducted in Uganda in a total of seven primary schools in the sub counties of Bungatira, Gulu District (three schools) and Magoro, Katakwi District (four schools). See figure 2.4. Sub counties and schools were included in the 2013 MCIS and the 2014 MCI.

FIGURE 2.4: MAP OF UGANDA AND RESEARCH SITES



The schools were chosen by Uganda Red Cross Society (URCS), DCA, and TPO who are partners of WoMena and existing actors and supporters of schools in Gulu and Katakwi. The schools were identified mainly based on the accessibility and the teachers' motivation and acceptability of interventions (WoMena 2013; WoMena

2015b).

All questionnaire surveys were conducted by local RAs. All five interviews included from Katakwi and four of the interviews included from Gulu were conducted in the respective local languages by the local RAs. Furthermore a total number of five interviews, including one pilot interview, which is included in this study, were collected in English by a Swedish master's student with the assistance of a local translator. The remaining four English interviews were part of the master's thesis study of the Swedish colleague and thus not possible to include in this study. This will be elaborated in section 3.2.

2.4 INTRODUCTION TO RESEARCH METHODS

Besides the systematic literature search conducted to answer research question 1, two different research methods were used in order to explore the remaining research questions for this study. Thus, a cross-sectional survey and semi-structured interviews were conducted. The tools were a structured questionnaire and a semi-structured interview guide. In total, 100 questionnaires and 10 semi-structures interviews are included in this study. They were collected as part of the MCIFUS in the sub counties of Bungatira, Gulu District, northern Uganda and Magoro, Katakwi District, eastern Uganda in the period November 2015 to April 2016. This section begins with outlining the development of the research tools followed by a description of the training of the research team, the piloting of the tools, and the data collection quality assurance.

2.4.1 DEVELOPMENT OF RESEARCH TOOLS

An English questionnaire and semi-structured interview guide were developed from August to October of 2015 by the WoMena research team, which consisted of experienced people from social sciences and health sciences, including public health. Furthermore, feedback and approval were sought through DCA, Mbarara University of Science and Technology (MUST), Rigshospitalet, and Ruby Life. Neither of the tools have been validated externally.

Subsequently, the tools were translated into the respective local languages, which are *Ateso* for Katakwi and *Luo* for Gulu. This was done by Ugandans from WoMena, speaking the relevant languages, who acted as non-professional translators. All translators were paid a standard rate fee for their work. To ensure consistency the translation of both the Ateso and Luo tools was since double-checked. Furthermore, in the training phases prior to the piloting and actual data collections, both translated tools were further checked and modifications were made.

2.4.2 TRAINING, PILOTING, AND QUALITY CONTROL

The research team in Gulu consisted of two local RAs, a Ugandan WoMena volunteer from Kampala, and two researchers being this researcher and a Swedish

master's student and WoMena colleague. The non-local part of the research team stayed in Gulu during the data collection in April 2016 to train and supervise the local RAs and to overlook the data collection process. The data collection carried out in November 2015 and March 2016 in Katakwi, was conducted similarly by the WoMena study coordinator and senior research officer alongside two local RAs.

To carry out the data collection, local RAs were used at each site, all with a pre-graduate degree and with prior research experience. Several of the RAs are also WoMena volunteers and have worked with training and sensitising girls on the subject of MHM and MCs.

Prior to the field trip to Gulu, extensive training of the researcher was carried out by the responsible WoMena study coordinator. The training consisted of how to communicate with participants and the community, how to collect informed consent, appropriate ethical conduct, and discussion about possible challenges in the field. The same training was since carried out in Gulu by the researchers in order to make sure that the RAs collected data of high quality. Furthermore, the RAs received training on how to carry out the survey correctly and how to probe extensively when interviewing. Similar training and supervision, both prior to the field trip and during, took place for both of the Katakwi data collection rounds.

Before commencing the actual data collection, both RAs piloted questionnaires and interviews and feedback was given to each of the assistants to ensure high quality of the collected data.

Furthermore, quality control of both the collected quantitative and qualitative data was done continuously during the data collection period. The quality checking consisted of the researchers observing the initial phase of each questionnaire interview to ensure anonymity of the participant and since checking that the questionnaire had been filled out correctly.

2.5 QUANTITATIVE RESEARCH METHOD

A descriptive, cross-sectional study was done to investigate research question 2[7].

The cross-sectional study design is a descriptive observational epidemiological design. It collects data at a defined and fixed point in time (Berg-Beckhoff & Hellmeier 2013).

The questionnaire (see appendix II) includes questions regarding experience with use and non-use of the MC, cleaning and sanitation relating to MC use, and overall perception of using the MC. For this study, focus will be on the questions relating to the girls' general experiences (question 13-14) and overall perception of using the MC (question 22-23). For examples see figure 2.5. Furthermore, the Gulu data collection included additional questions related to the respondents' acceptance of the MC. The first question asked the respondents how they generally felt about using the MC using a five point Likert scale (see figure 2.6). Likert scaling is a way to measure attitudes using a multiple-item procedure (Fabrigar & Wood 2007). Respondents show their agreement to the question on a five-point response scale, in this case a visual scale of smiley faces, ranging from *"very happy"* to *"very unhappy"*. The respondents were shown only the smiley faces and not the related meanings of the five different faces. The second question asked the respondents if they would recommend the MC to a friend.

2.5.1 DATA COLLECTION

A total of 29 questionnaires were collected from Gulu and 71 questionnaires were collected from Katakwi (see chapter 3).

The RAs carried out the survey in the respective local languages, hence the respondents did not fill out the questionnaire themselves; the survey was interviewer-administered. While the RAs conducted the questionnaires, the researchers observed and noted the position of interviewer and interviewee, their body language, and consistency of the execution, though limited by the language differences.

[7] **2.** *How has the menstrual cup overall been accepted and used among adolescent Ugandan girls in Gulu and Katakwi?*

FIGURE 2.5: EXAMPLES OF QUESTIONNAIRE QUESTIONS INCL. FOR ANALYSIS

Examples of questions relating to:
EXPERIENCES WITH USE AND NON-USE OF THE MENSTRUAL CUP

14 .Did you ever try to use the menstrual cup?

1. Yes, I have tried using the cup several times GO TO QUESTION 14a
2. Yes, I tried using the cup, but did not continue using it GO TO QUESTION 14a
3. No, I never tried to use it GO TO QUESTION 14b
4. Other (specify):……

14a. If YES - Are you still using your cup?

1. Yes - GOT O QUESTION **15**
2. No - GO TO QUESTION **14b**

14b. If NO - Why not? *(Multiple answers allowed)*

1. I did not like using it
2. The cup leaked
3. The cup was difficult to clean
4. The cup smelled
5. It was difficult to find a private place to empty the cup¨
6. It was difficult to insert
7. It was difficult to take out
8. My family/friends did not like it
9. I had problems with infections
10. I experienced pain when using the cup
11. I misplaced it and could not get a new one - explain why ……
12. Other (specify): ……

Examples of questions relating to:
OVERALL PERCEPTION OF USING THE MENSTRUAL CUP

22. What do you <u>like</u> about using the menstrual cup? *[Multiple responses are allowed]*

1. I have saved money (as I don't have to buy or buy less products/soap)
2. It helps me to avoid leaking during heavy flow
3. It is comfortable to wear
4. It does not irritate my skin as with other products/methods
5. I can reuse it
6. I can do more things (e.g. go to school/work)
7. Do not know
8. Other (specify): ……

FIGURE 2.6: LIKERT SCALE – ACCEPTABILITY OF THE MC

24. In general, how do you feel using the menstrual cup?

I feel very happy | I feel happy | I feel neither happy nor unhappy | I feel unhappy | I feel very unhappy

The execution of the questionnaire surveys took place at private places on the school compound, i.e. under a mango tree at the back of the school grounds, away from other students. For the ones no longer attending school, the survey was executed in the girls' homes.

2.5.2 DATA ANALYSIS

After collecting the data, analysis of the data was conducted. Prior to the analysis, the data needed to be coded and cleansed.

2.5.2.1 CODING AND CLEANSING OF DATA

Data from the questionnaires was double-entered into the data-managing program EpiData version 3.1 and then exported using the statistical program Stata/IC version 14.0 (©1985-2015 StataCorp LP) for statistical analyses.

EpiData data entry forms were coded by the WoMena study coordinator. Survey answers were coded 0 for *"No"* and 1 for *"Yes"* for dichotomous variables. For categorical variables continuous numbering were used. If a question lacked a response it was coded 999 for *"missing value"*.

Since the survey was interviewer-administered, there did not occur invalid responses. Misinterpretations by the RAs of questions 3, 6, 7, and 8[8] led to exclusion of those responses since they were inconsistent.

The entered data was checked by a WoMena colleague before being exported to Stata.

Then data was cleaned. This was done by double-checking each variable against the questionnaires if an error was identified. Errors were corrected in the data set in Stata. Unusable data was excluded from the data set, for example data from one Katakwi questionnaire was excluded, as it was data relating from Kitgum, which was incorrectly entered with the data from Katakwi. Furthermore, data from one Gulu questionnaire was excluded, as the questionnaire was incomplete due to the respondent not having tried the MC before loosing it. Thus, a total of 29 questionnaires were collected from Gulu and a total of 71 questionnaires were collected from Katakwi, leaving the final data set with data from 100 survey questionnaires.

[8] Questions were: **3.** *What is your current status of employment?* **6.** *How many rooms are there in your household?* **7.** *How many people are there in your household?* **8.** *Who do you currently live together with?*

2.5.2.2 ANALYSIS OF DATA

Statistical analysis weas conducted after coding and cleansing the data, to see the outcome of the survey.

Depending on the type of survey variables and the sample size, different assessments can be done. Uni- and bivariate analysis can be made from nominal data, which means that the response categories in the survey are unordered. Univariate analysis describes the variables from the dataset and identifies the variables that can be used for bivariate analysis. Bivariate analysis describes a possible association between two variables. This is done either proportionally or through correlation tests. For more complex data like scaled data, more comprehensive analyses such as multivariate analysis can be conducted (Bowling 2010).

In this study, a univariate analysis of the survey data was made to describe the data material and explore the characteristics of the respondents. Secondly, a number of demographic variables were compared to the use/non-use of the MC and the liking/disliking of the MC using Fisher's exact test. Thirdly, bivariate analysis, using logistic regression for calculating the Odds Ratios (ORs), was done to explore possible correlations between socio-economic characteristics and continued/discontinued usage of the MC. Due to the limited sample size and the type of data, multivariate analysis was not made.

LOGISTIC REGRESSION ANALYSIS

Using the software Prism 7.0 (©1994-2016 GraphPad Software, Inc.) contingency tables were made and ORs estimated by doing logistic regression. Contingency, or two-by-two tables, are tables including binary data on exposure and outcome, see table 2.4.

TABLE 2.4: EXAMPLE OF CONTINGENCY TABLE (TWO-BY-TWO)

		OUTCOME		
		YES	NO	
EXPOSURE	YES	A	B	**A+B**
	NO	C	D	**C+D**
		A+C	**B+D**	**A+B+C+D**

The exposures were the socio-economic characteristics (see table 3.2), and the outcome was continued or discontinued use of the MC. For all exposures that did not already comply with a dichotomous scale, one was applied. This concerned:

Age (initially continuous)**:**

1. 13-15 years
2. >16 years

Educational level (initially, *'not finished primary', 'finished primary', 'not finished secondary'*)**:**

1. Finished primary school
2. Not finished primary school

Religion and ethnicity were divided into the two main religions and ethnicities in the research sites[9]. Other religions or ethnicities were excluded from analysis, as the number was too small to analyse.

Logistic regression is done to estimate the exposure effect when having a binary or categorical outcome. The model assumptions for doing logistic regression analysis are that the sample should exceed a minimum of 30 samples, data must be independent, meaning that the same person cannot be measured twice, and the outcome must be binary or categorical (Kirkwood et al. 2003a; Berg-Beckhoff & Hellmeier 2013). All assumptions are met in this study.
The analysis calculates OR using the following formula:

$$\text{OR} = \frac{\frac{A}{B}}{\frac{C}{D}} = \frac{A*D}{B*C}$$

The OR are most often used in case control studies where comparison is made of the risk of getting i.e. a disease in a control group compared to a case group (Kirkwood et al. 2003a). It can be applied in cross-sectional studies too. The OR value states the relative likelihood of getting the disease. The lowest OR value to be calculated is zero and the highest is infinite. An OR between 0 and 1 means that the likelihood of getting i.e. a disease is lesser in the case group than in the control group, which could be interpreted as a protecting factor. If the OR value equals 1 there is no difference between the groups for getting i.e. a disease and if the OR value is above 1 it means that the exposure compose a risk of getting i.e. a disease

[9] The main religions were Catholicism and Protestantism/Anglicanism. The main ethnicities were Acholi (Gulu) and Iteso (Katakwi).

(Berg-Beckhoff & Hellmeier 2013). For binary exposure, which is the case in this study, the OR states the expected number of times the risk is increased or reduced for an exposed person compared to an unexposed person (Kirkwood et al. 2003a). ORs are calculated with a Confidence Interval (CI). A CI indicates the interval in which the true value can be found in an overall population. The CI is connected to a probability, usually 95%. This means that the true value lies within the CI with a probability of 95% (Berg-Beckhoff & Hellmeier 2013; Kirkwood et al. 2003a).

Furthermore, p-values were calculated using Prism 7.0. This was done by Fisher's exact test, as this applies to small samples. The p-value indicates the effect and precision of the value, in this case the OR. More specifically, the p-value shows whether or not there is an effect of the exposure on the outcome and whether the power and precision of the sample is high and thus not a mere coincidence. A significant p-value helps to assure an effect if it is there. A p-value is commonly set to 5% (p=0.05). This means that with a probability of only 5% there is no causal relationship between exposure and outcome and the measured effect is coincidental (Berg-Beckhoff & Hellmeier 2013; Kirkwood et al. 2003a).

It should be noted that when analyzing data from cross-sectional surveys, causal relationships cannot be proven as cross-sectional surveys show a certain point in time and not i.e. cases and controls followed over time to assess the possible impact of an exposure on an outcome.

2.6 QUALITATIVE RESEARCH METHOD

In order to investigate research question 3[10] the semi-structured interviews were conducted.

The semi-structured interview is appropriate when having fixed research topics, that need investigation but at the same time giving space to probe the answers of the participants (Kvale & Brinkmann 2009). The interview guide developed by WoMena was used when conducting all interviews (see appendix III).

The interview guide was fairly comprehensive, not only addressing issues such as general use, acceptance and perception of the MC but also hygienic issues and overall community acceptance. Focus in this study will be on the elements that relate to general use, perception and acceptance. However, in order to make sure that no descriptions from the participants that could be of interest to the study are missed, all the transcribed data was explored thoroughly.

A purposively sampling technique (Lewis-Beck et al. 2004; Bowling 2010) was used for participant selection for the interviews, as the MCIFUS wanted to interview both girls who continued and discontinued using the MC. The questionnaire survey respondents were used to identify relevant interview participants.

2.6.1 DATA COLLECTION

In Katakwi, one pilot interview of high quality and four interviews were used, done in the local language Ateso. In Gulu, one pilot interview and three interviews were collected in local language Luo. The Swedish student also conducted a pilot interview in English using a translator[11]. All above-mentioned interviews are included in this thesis.

The interviews were digitally recorded onto two different devices and were afterwards transcribed verbatim and translated into English.

[10] **3.** *How do adolescent Ugandan girls in Gulu and Katakwi perceive menstrual health and management and what are their experiences with the menstrual cup?*

[11] As mentioned earlier, the Swedish student conducted interviews in English using a translator as a part of her master's thesis study and hence, the data from these interviews were not possible to include in this study.

Although limited by the language differences, observations of the interview situation were noted and debriefing of the RAs and evaluation of the interviews was done after each interview. Observations were made from a distance in order not to disturb the confidentiality of the interviewer and interviewee.

Similar to the questionnaire surveys, the interviews were conducted at private areas around the school compounds or in the girls' homes.

2.6.2 DATA ANALYSIS

After the interviews had been conducted, the data was analysed. That entailed that the data recordings needed to be transcribed and translated into English, after which the transcriptions were coded and analysed.

2.6.2.1 TRANSCRIPTION OF DATA

Transcription and translation into English were done by RAs and WoMena volunteers speaking Ateso and Luo. The transcribers received thorough guidance on the process. This included them knowing to transcribe and translate verbatim and note pauses, sighs, laughs, etc. of the interviewer and interviewee. Furthermore, they were instructed in using time stamps at each question to make tracing in the recordings easier. The transcribers were able to contact the researcher or other WoMena colleagues involved in the MCIFUS at all times.

Two people were used for the Katakwi interviews, all in local language, and two people were used for the Gulu interviews, four in local language The pilot interview in English was transcribed by the researcher. The transcriptions were all double-checked and the recordings were listened through by the research team for change in tone, intonation when speaking, and to make sure that the length of the question or response matched the length of what was transcribed. All people transcribing and translating received a standard rate fee for each transcription.

All transcriptions were uploaded and structured for analysis using NVivo version 11.2.2 (©International QSR Pty Ltd.).

2.6.2.2 ANALYSIS OF DATA

Qualitative Content Analysis (QCA) (Drisko & Maschi 2015; Schreier 2014) was used to analyse the findings from the interviews. All transcriptions were read through several times in order to get well acquainted with the material (Drisko &

Maschi 2015; Schreier 2014). Then, a coding frame was made for coding and analysis.

CODING FRAME

The coding frame is the heart of the QCA (Schreier 2014). Coded categories should be credible, authentic, and persuasive to readers (Schreier 2012a; Schreier 2014). The coding frame consists of main categories and subcategories. Main categories are what the researcher wants to learn about while subcategories specifies what is said in the data material (Schreier 2014).

The process of building a coding frame consists of five sections done iteratively and, for some, in a cyclic manner.

The sections are:

1. Selecting material
2. Structuring and generating
3. Defining
4. Revising and expanding
5. Segmentation

(Schreier 2012a)

The categories were identified using both a deductive and inductive approach. Deriving categories deductively means that topics of interest have already been identified prior to coding the data material. Opposite deductive identification of categories is inductive identification, which means that categories are identified while going through the data material, being open to the meaningful words and topics that emerge (Drisko & Maschi 2015).

The identified categories from the coding of the data material were:

Deductive categories:

- Perception of the MC (two subcategories)
  1. (Dis)Contentment with the MC
  2. Community perception of the MC
- Menstrual Health and Management (two subcategories)
  1. Practice and knowledge
  2. Sanitary products

The deductive categories were identified based on the findings from the literature review on MHM and the perception and acceptance of the MC from the study survey (see section 3.1 and 3.4).

Inductive categories:

- Fear (two subcategories)
  1. Fear of 'rumour mongering'
  2. Hiding menstrual status
- Freedom (two subcategories)
  1. Free to be free
  2. 'Stay as if not on menstruation'

The inductive categories were identified based on the statements from the informants. Going through the transcriptions numerous times revealed reoccurring statements related to fear and freedom.

For examples of the category identification and coding process, see table 2.5.

For all categories, recoding the data led to merging and deletion of categories. This is an expected process in QCA, because analysis is a part of the coding process (Drisko & Maschi 2015; Schreier 2012a).

TABLE 2.5: EXAMPLES OF CATEGORY IDENTIFICATION AND CODING PROCESS

CATEGORY	PERCEPTION OF THE MC	FREEDOM
Sub category	COMMUNITY PERCEPTION OF THE MC	FREE TO BE FREE
Definition	Community and peer perception of the MC. Including misconceptions/misinformation related to the MC both within the community and from the outside.	Narratives related to statements about being free when using the MC. This includes saving money.
Coding unit example	*Others they were very rude. That they could say that 'you are using that cup, which is not good'.*	*When I was using the cup I was comfortable and I didn't have any problem, I could sit and relax and not think about whether my clothing gets stained.*

2.7 ETHICAL CONSIDERATIONS

The following outlines the ethical considerations of the study. As the study is a part of the MCIFUS, WoMena addressed the ethical issue of obtaining overall ethical approval.

2.7.1 STUDY APPROVAL

Overall study approval for the MCIFUS was obtained from the Uganda National Council for Science and Technology (UNCST). This also requires an ethical review and approval from a research ethics committee at a registered Ugandan university or research institution. In this case, the approval was sought through Mbarara University of Science and Technology. Furthermore, the National Guidelines for Research Involving Humans as Research Participants (version July 2014) were followed. These are developed and overseen by UNCST (WoMena 2015b).

2.7.2 INFORMING PARTICIPANTS

Prior to the data collection, we hosted separate information meetings for the girls and their parents or caregivers. During these meetings, the aim and methods of the study was explained carefully and time was set-aside for the participants or their parents or caregivers to pose questions. Furthermore, the girls received a letter containing information about the study and a list of contact information for both WoMena researchers and relevant study partners, including universities (see appendix V). All information was provided in local languages. Thus, the girls were extensively informed both orally and in writing before deciding whether to participate or not. The participants received no incentives for participating.

2.7.3 INFORMED CONSENT

Written informed consent was obtained from each research participant and appropriately documented (see appendix VI). In addition to participant consent, parental or caretaker consent was obtained for all minors (children under the age of 18).

Emphasis was put on the fact that the girls could withdraw from the study at any given time they would wish to do so and that they should not feel pressured neither by their parents, teachers nor WoMena to participate.

2.7.4 ANONYMITY AND CONFIDENTIALITY

Several measures were taken in order to ensure anonymity of the participants. Pseudonyms are used when quoting informants from the interviews. Neither questionnaires nor interview log forms contain any participant names, only participant number. Participant names have been deleted from transcripts. Only relevant MCIFUS research team members know the true names of the girls and schools included in the study.

Furthermore, data from the study containing confidential information are only available to a small number of MCIFUS researchers and are secured with a password.

3.0 RESULTS

This chapter presents the findings from the study analysis. Initially, findings from literature review are outlined. Secondly, the study population is presented. Thirdly, findings from the survey including additional findings are outlined. Fourthly, the findings from the interviews are presented. Finally, the chapter is summed up.

3.1 FINDINGS FROM LITERATURE REVIEW

The systematic literature search included 17 articles for further reviewing (see figure 2.1). Sixteen are peer-reviewed journal articles and one is a policy brief. The articles were published between 2010 and 2016. See table 3.1 and appendix IV.

3.1.1 THE MENSTRUAL CUP

Most recent peer-reviewed literature in the field of interest concerns menstrual management methods and menstrual knowledge and practice in general.

Overall, studies directly related to the usage of the MC are scarce. In relation to the PICO-scheme (see table 2.1) made for this literature search, only three articles involved the MC (Mason et al. 2015; APHRC 2010; Beksinska et al. 2015b). These articles assessed the experience, attitude, and acceptability of the MC as a menstrual management method in low-income settings. All were intervention studies.

The study from Kenya by Mason et al. compared the usage of the MC to sanitary pads or traditional methods and is supposedly the largest study to date documenting MC experiences of rural African schoolgirls (Mason et al. 2015). Mason et al. found enhanced quality of life and qualitative evidence of improved school attendance and performance (Mason et al. 2015). Also in Kenya, African Population and Health Research Center (APHRC) found that the MC was viewed as a sustainable, practical, and cost-effective menstrual management method and according to APHRC, it could furthermore help promote the dialogue on SRH (APHRC 2010). In South Africa, Beksinska et al. found that the MC was rated significantly better for comfort, quality, and preference compared to pads or tampons (Beksinska et al. 2015b). Furthermore, the acceptability of the MC is high and no health risks related with using it were assessed (Beksinska et al. 2015b; Mason et al. 2015). The findings in the articles are included in the following, as they investigate other MHM issues too.

3.1.2 KNOWLEDGE AND PRACTICE

Five of the studies sought to examine the knowledge and practice of menstrual management and SRH. A cross-sectional study from Ethiopia (Gultie et al. 2014a) was the only one to conclude that there was a high level of knowledge among the

participants, though this was influenced by socio-economic factors. The remaining four studies all concluded that the level of SRH knowledge was poor, especially around the time of menarche (APHRC 2010; Lawan et al. 2010; Tegegne & Sisay 2014; Upashe et al. 2015). A mixed methods study by APHRC (2010) was set in Kenya, a cross-sectional study by Lawan et al. (2010) was set in Nigeria, while a mixed methods study by Tegegne & Sisay (2014) and a cross-sectional study by Upashe et al. (2014) both were set in Ethiopia. The educational level of the parents played a role in the menstrual management practice of the girls and poor menstrual hygiene methods were most often applied when knowledge was poor (Upashe et al. 2015). All studies further showed that SRH education for adolescents of both genders, as well as their parents, could be an important factor for female empowerment and a way to decrease sexual harassment, teasing and humiliation.

3.1.3 SCHOOL ATTENDANCE

Six studies focused on MHM and school absenteeism. One study from Malawi by Grant et al. showed no gender difference in school absence, though there was a self-reported absence related to menstruation. The study concluded that MHM should be included in the life skills curriculum (Grant et al. 2013). Another study from Uganda by Boosey et al. found that there was a loss of education due to a lack of proper menstrual management facilities and that poor or lacking menstrual management methods led to poor concentration of the girls when in class due to fear of leakage or shaming by their peers or teachers (Boosey et al. 2014). The study by Mason et al. found qualitative evidence of increased school attendance and concentration when using the MC, which furthermore was supported by their parents (Mason et al. 2015). A study by Sommer et al. was a comparative study of four LICs and sought to examine the sanitation and hygiene needs of schoolgirls as well as their school attendance and relationship with peers, teachers, and parents on matters related to menstrual health and SRH. The study concluded that there was a negative attitude towards menstruation in all examined settings and that cultural myths and a lack of parental support affected the girls' menstrual management, which furthermore affected their school attendance (Sommer, Ackatia-Armah, et al. 2015).

TABLE 3.1: OVERVIEW OF ARTICLES INCLUDED IN LITERATURE REVIEW

Author(s)	Year	Overall aim	Setting	Methodology
APHRC	2010	To explore knowledge of and attitudes towards menstruation and associated practices	Urban Kenya	Mixed method
Beksinska et al.	2015	To compare acceptability and performance of the MC to pads or tampons and measure and assess the safety of each product.	Urban South Africa	Cross-over trial
Boosey et al.	2014	To assess and explore the extent to which schoolgirls can manage their menstruation and if it impacts their education.	Rural Uganda	Mixed method
Grant et al.	2013	To examine the factors associated with menstruation-related school absenteeism	Rural Malawi	Longitudinal study
Gultie et al.	2014	To assess the knowledge level and contextual factors related to menstrual hygiene management	Rural Ethiopia	Cross-sectional
Hennegan & Montgomery	2016	To summarise and critically appraise evidence for the effectiveness of menstruation management interventions on improving education, work, and psychosocial wellbeing	-	Systematic review
Jewitt & Ryley	2014	To investigate cultural and spatial limitations associated with menstruation and puberty	Kenya	Interviews and FGDs
Lawan et al.	2014	To examine the knowledge and practices around menstruation and menstrual hygiene	Rural Nigeria	Cross-sectional
Mason et al.	2013	To examine the menstrual experiences of adolescent schoolgirls	Rural Kenya	FGDs
Mason et al.	2015	To compare the effects of the MC, pads and traditional methods on schoolgirls' school attendance and overall life	Rural Kenya	FGDs
McMahon et al.	2011	To examine the perceptions and practices of schoolgirls related to menstruation	Rural Kenya	Interviews and FGDs
Montgomery et al.	2012	To assess the role of sanitary pads in girls' education	Rural Ghana	Intervention study.
Phillips-Howard et al.	2015	To investigate if the value and necessity of sanitary products affect the sexual exposures of impoverished females	Rural Kenya	Cross-sectional
Sommer et al.	2015	To examine school participation, parental/teacher/peer relationship, sanitation and hygiene needs, and the understanding of menstrual issues and taboos in girls	Tanzania, Ghana, Cambodia and Ethiopia	Observations and interviews
Sumpter & Torondel	2013	To systematically collate, summarise, and critically appraise the available evidence on different menstrual hygiene management approaches	-	Systematic review
Tegegne & Sisay	2014	To examine the level of knowledge about menstruation, determinants of menstrual management, and its influence on school attendance	Rural Ethiopia	Mixed method
Upashe et al.	2015	To assess the knowledge and practice of menstrual hygiene	Rural Ethiopia	Cross-sectional

A Kenyan study by Jewitt & Ryley found, that menstruation is likely to cause gender inequities in schools leading to girls missing school or dropping out. The study suggested that reducing the risk of shame related to i.e. menstrual leaks by improving the MHM facilities for the girls could lead to them attending school and concentrating better as well as allowing them greater spatial mobility within and outside school (Jewitt & Ryley 2014).

Finally, a pilot intervention study from Ghana by Montgomery et al. aimed to assess the effect of sanitary pads on girls' school attendance. The researchers supplied one group of girls with sanitary pads and SRH education while another group only received SRH education. The conclusion was that school attendance rose for both groups, though with delayed effect for the group receiving only SRH education (Montgomery et al. 2012).

3.1.4 MENSTRUATION RELATED PERCEPTIONS AND EXPERIENCES

Three articles sought to examine the experiences and perceptions about menstruation. In another study by Mason et al. from rural Kenya, it was found that even though girls were resourceful, they lacked optimal solutions to manage their menstruation. The study concluded, that the girls were ill prepared for menarche and generally unable to share thoughts on menstrual hygiene management with parents, teachers, and peers (Mason et al. 2013).

In a different rural Kenyan study McMahon et al. found that girls lacked empowerment when entering womanhood. The study concluded, that the girls needed knowledge when it came to menstrual management and SRH to gain power over their bodies (McMahon et al. 2011).

In a third study from rural Kenya, Phillips-Howard et al. found that young, impoverished girls were likely to have transactional sex for sanitary products, increasing their risk of STIs and unwanted pregnancies (Phillips-Howard et al. 2015).

3.1.5 SYSTEMATIC REVIEWS

A systematic review by Hennegan & Montgomery concluded that there was insufficient evidence of the effectiveness of MHM intervention studies, although the current results were promising (Hennegan & Montgomery 2016).

The other systematic review by Sumpter & Torondel concluded that menstrual management presents a significant challenge for women in low-income settings. The researchers concluded that further research is needed to understand the effect that poor menstrual management possibly has on school attendance. The study especially asks for high quality randomised controlled trials (Sumpter & Torondel 2013).

3.1.6 SUMMARY OF FINDINGS FROM LITERATURE REVIEW

Overall, the results from the literature review showed a lack of knowledge related to SRH and menarche/menstruation for both adolescent girls and their parents. The tendency in the literature review was that poor knowledge leads to poor menstrual management, an increased risk of infections, and a loss of bodily control and overall empowerment for the schoolgirls. Furthermore, poor access to menstrual management methods increased the risk of sexual exposures like transactional sex for disposable pads and thus increased risk of STIs and pregnancy.

The performance and acceptability of the MC, in the few studies identified, was high. Girls and women reported overall satisfaction and enhanced quality of life with using the MC as a menstrual management method.

Education and knowledge on proper MHM can probably lead to decreased school absenteeism and increase concentration and spatial mobility of girls in school, though the effect will be greater if combined with a hygienic menstrual management method and proper sanitary facilities.

The conclusion in all studies was that there is an overall need for further research on the field of menstruation and MHM, as well as knowledge on the perception from using the MC.

3.2 STUDY POPULATION

The study population consists of 100 current or former schoolgirls in the age 13 to 21 years from Magoro, Katakwi and Bungatira, Gulu in rural eastern and northern Uganda. The girls had all taken part in the previous MCIS or MCI conducted at the same two sites between 2013 and 2014, see figure 2.2.

The MCIFUS included data collected from a cross-sectional survey using a questionnaire and semi-structured interviews, which are included in this study.

A flow chart of the collected data material for this study is shown in figure 3.1.

3.2.1 BUNGATIRA, GULU

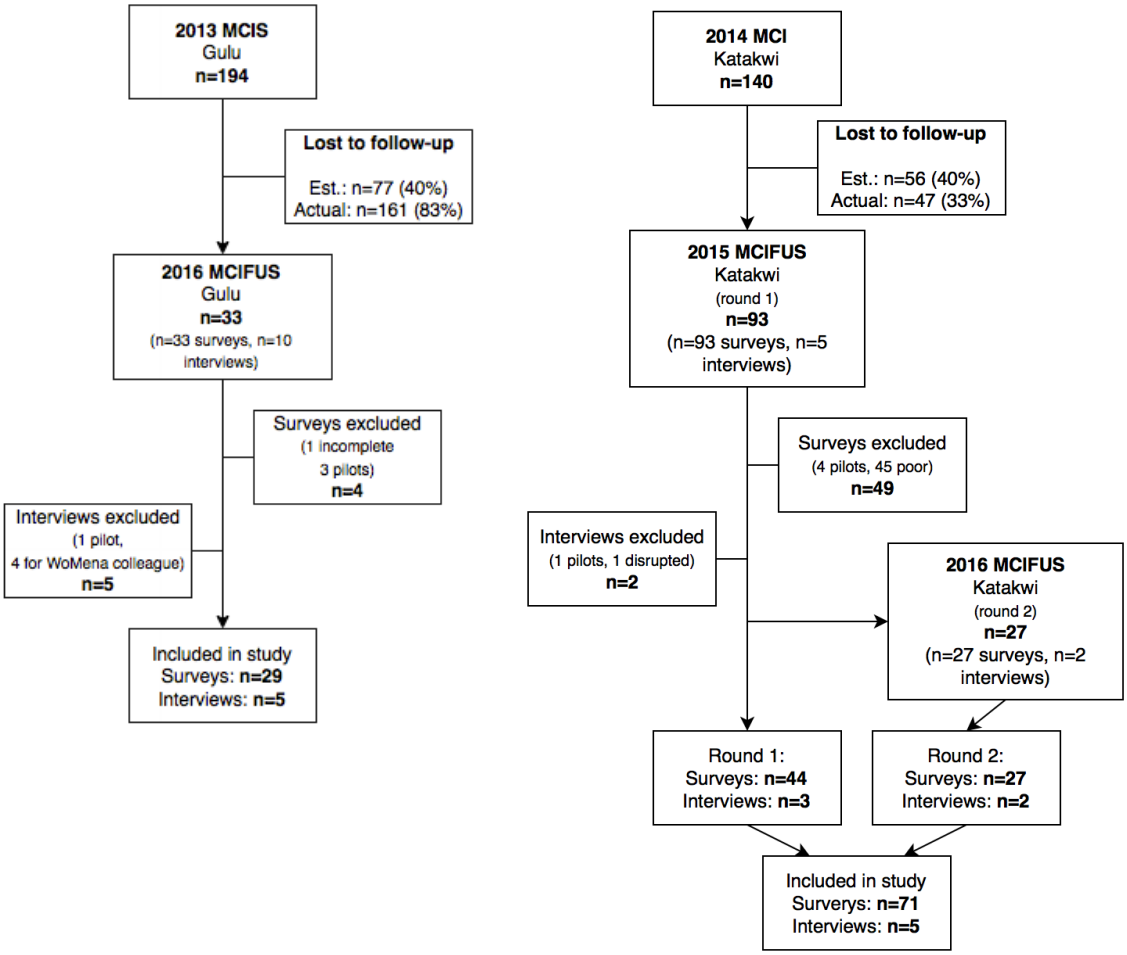
The 2013 Gulu MCIS included 194 girls. For the MCIFUS, an estimated loss to follow up was 40% (n=77), and the aim was to include a minimum of 90 girls from Gulu. The head teachers and senior woman teachers from each school helped access the girls still in school. In order to reach as many of the girls from the initial 2013 MCIS, who were no longer in school, two former teachers familiar with the study area helped mobilise girls in the villages. A total of 33 girls were mobilised, leaving 161 girls as lost to follow-up.

Thirty-three questionnaires and 10 interviews were collected in Gulu, five in the local language Luo and five in English using a translator[12].

Of the 33 questionnaires collected, three were pilots and thus excluded from analysis. An additional questionnaire needed to be excluded due to incompletion because the respondent lost the MC before trying it.

[12] As explained in section 2.3.2, one pilot interview and four interviews were conducted by the Swedish master's students for her thesis. The four interviews were not possible to include in this study. The pilot interview was excluded from the Swedish student's study and thus included in this study.

FIGURE 3.1: FLOW CHART OF COLLECTED DATA MATERIAL FOR THIS STUDY



Hence, the total number of survey responses included in the follow-up study from the Gulu site was 29.

One of the five interviews conducted in English were a pilot interview. However, it was decided to include it into the analysis as it provided a lot of useful information. Of the five interviews conducted in Luo, two were pilots. One of these was of poor quality and therefore excluded from the study analysis. The other pilot was included in the study analysis. All interviews were conducted with girls who had also taken part in the survey.

3.2.2 MAGORO, KATAKWI

The 2014 Katakwi MCI included 140 girls. The loss to follow up was estimated to be 56 girls (40%) but only 47 girls were lost to follow up partly due to the fact that it had only been around six months since some girls received the MC, thus making it easier to re-mobilise them, and partly due to mobilisation done by teachers and

volunteers from TPO in advance of the MCIFUS. Initially 93 girls were included in the MCIFUS and 93 questionnaires and five interviews were conducted. However, 45 questionnaires were excluded due to poor quality wherefore a second round of data collection was conducted to enhance the number of participants in the MCIFUS[13]. Four questionnaires from the first round of data collection were pilots and thus excluded for analysis. The total number of questionnaires used in this study was 71 (see figure 2.2).

Of the five interviews collected in round 1, two were pilots, one of which was of too poor quality to be included in the analysis. One interview was disrupted due to the participant wishing to withdraw from the study and thus excluded. Hence, after the second round of data collection a total number of five interviews were used from the Katakwi site. All interviews were conducted with girls who had also taken part in the survey.

[13] After collecting the data in 2015, data quality of parts of the data material turned out to be of poor quality due to illness of one of the local research assistants and 45 questionnaires and two interviews were excluded. Hence, WoMena decided to return to Katakwi in March 2016 to recollect 27 questionnaires and two interviews in a second round of data collection (see figure 2.2). Only 27 questionnaires of the 45 excluded were recollected as not all participants could be mobilised again.

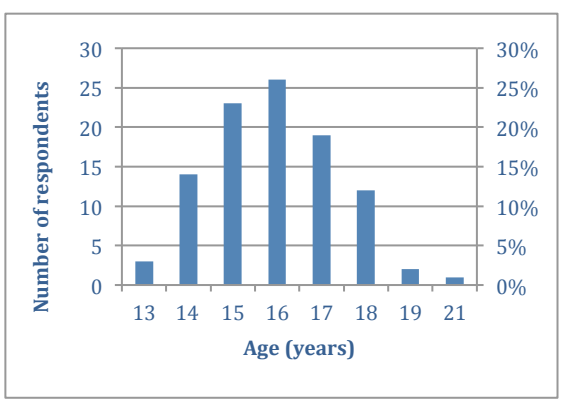
3.3 SOCIO-ECONOMIC CHARACTERISTICS OF RESPONDENTS

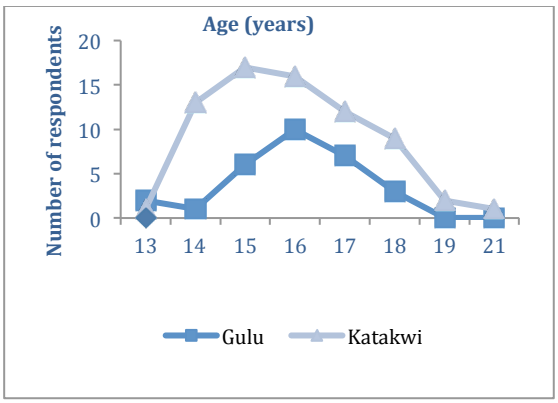
This section outlines the socio-economic characteristics of the respondents in the cross-sectional survey. For a comprehensive overview see table 3.2. The survey questions related to this section are questions 1a, 2a, 4, 5, and 9-10[14] (see appendix II for complete questionnaire).

3.3.1 AGE

The mean age of the respondents was 15.94 years. The age distribution is shown in figure 3.2 and 3.3. The distribution of age between the two research sites is not differing (p=0.28), though looking at figure 3.3 it seems like there is a difference between the two sites. The discrepancy might be due to the small sample size, which will be discussed in chapter 4.

FIGURE 3.2 AND 3.3: AGE DISTRIBUTION OF RESPONDENTS INCL. DIVISION ON RESEARCH SITE





3.3.2 MARITAL STATUS AND CHILDREN

Only 2% (n=2) of the respondents were married. Both were 18 years old and from Katakwi. Six percent (n=6) had one child at the time of the survey. The age of the mothers ranged from 14 to 18 years. The mothers were equally divided between the sites; 50% (n=3) at each site but as the sample in Gulu was smaller, the number was proportionally higher here, which could be a tendency towards more adolescent mothers in Gulu compared to Katakwi. However, there seem to be no difference between the sites (p=0.54). This might be comprised by the sample size.

[14] Questions 1a, 2a, 4, 5, 9, and 10: **1a.** *What is your age?* **2a.** *If yes, what is your level of education?* **4.** *What is your current marital status?* **5.** *Do you have any children?* **9.** *What is your religion?* **10.** *What ethnic group do you belong to?*

TABLE 3.2: SOCIO-ECONOMIC CHARACTERISTICS OF RESPONDENTS

Characteristics	Overall N=100		Gulu N=29 (29%)		Katakwi N=71 (71%)		P-value[a]
	N	% or mean ± SD	N	% or mean ± SD	N	% or mean ± SD	
Age (years)	100	15.9±1.5	29	16.0±1.3	71	15.9±1.6	0.28
Marital status							
Married	2	2.0	0	0.0	2	2.8	
Not married	95	95.0	29	29.0	66	93.0	0.59
Missing	3	3.0	0	0.0	3	4.2	
Children							
Yes	6	6.0	3	10.3	3	4.2	
No	93	93.0	26	89.7	67	94.4	0.54
Missing	1	1.0	0	0	1	1.4	
Level of education							
Not finished primary	54	54.0	19	65.5	35	49.3	
Finished primary	25	25.0	2	6.9	23	32.4	
Not finished secondary	16	16.0	5	17.2	11	15.5	0.02
Missing	5	5.0	3	10.3	2	2.8	
Religion							
Catholic	68	68.0	26	89.7	42	59.2	
Anglican/protestant	28	28.0	2	6.9	26	36.6	
Pentecostal	2	2.0	0	0	2	2.8	
Muslim	1	1.0	0	0	1	1.4	
Other	1	1.0	1	3.5	0	0	0.02
Ethnicity							
Acholi	27	27.0	26	90.0	1	1.4	
Iteso	70	70.0	0	0.0	70	98.6	
Other	3	3.0	3	10.3	0	0.0	<0.001

[a] Fisher's exact test.

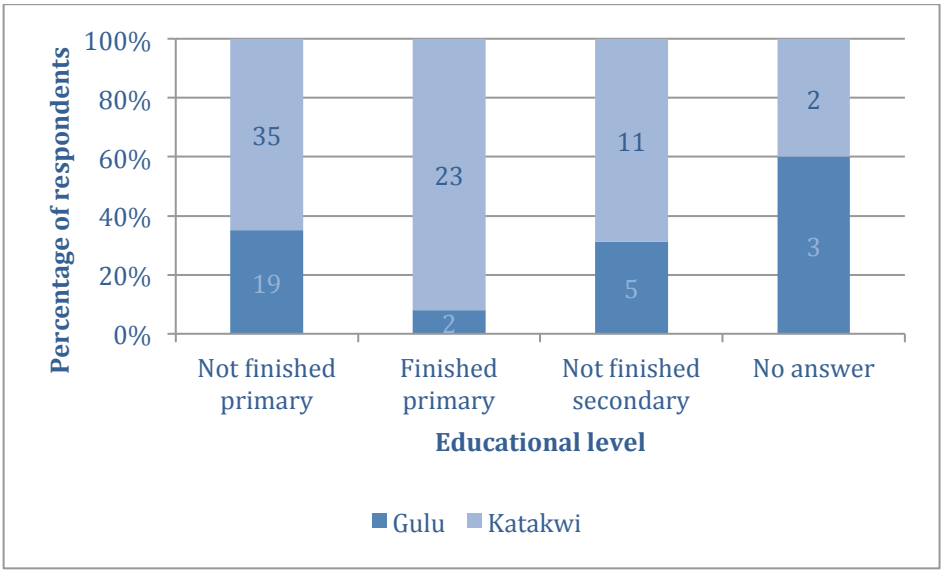
It should be noted, that a likely reason for not finding more married girls or adolescent mothers, is that the girls move away from the villages when they get married or do not return to school after given birth.

3.3.3 LEVEL OF EDUCATION

Overall, all respondents have attended primary school at some point as the MCIS and the MCI were carried out at primary schools. The majority of the respondents (54%; n=54) had not finished primary school, which means that they were either still attending primary school level or had dropped out. Twenty-five percent (n=25) had finished primary level but did not advance to secondary school. Only 16% (n=16) were attending secondary school but have not yet finished. No respondents had an educational level above secondary. Five percent (n=5) did not disclose their level of education.

Figure 3.4 outlines the level of education of the respondents divided on research sites. There is a significant difference on the level of education for the respondents at each site (p=0.02). It seems that there are more respondents with a higher level of education in Katakwi. As mentioned earlier, there is a possibility that the p-value is affected by the small sample size.

FIGURE 3.4: LEVEL OF EDUCATION DIVIDED ON RESEARCH SITE



3.3.4 RELIGION

Sixty-eight percent (n=68) of the girls were Catholics and 28% (n=28) were Anglicans/Protestants. The remaining 4% (n=4) were Muslim, Pentecostal or other. In Gulu, the majority, more than 89% (n=26) of the respondents, were Catholic while this was 59% (n=42) for Katakwi. In Katakwi, more than 36% (n=26) of the respondents were Anglican/Protestant while this was only 7% (n=2) in Gulu. There is thus a difference between research sites, which is supported by a significant p-value of 0.02. Again, this might be affected by the small sample size.

3.3.5 ETHNICITY

In Katakwi, the main ethnicity is Iteso, and 70 out of 71 respondents from Katakwi identified themselves as Iteso. In Gulu, the main ethnicity is Acholi and 27 of 29 respondents identified themselves as such.

3.4 FINDINGS IN THE SURVEY

This section outlines the findings from the survey. Firstly, the respondents' experiences with the use and non-use of the MC are outlined followed by their overall perception of the MC. Secondly, a comparison, using the OR, is made between the continued and discontinued use of the MC based on the socio-economic characteristics of the respondents.
The survey questions related to this section include questions 13 and 14[15] for section 3.4.1 and questions 22 and 23[16] for section 3.4.2 (se appendix II).

3.4.1 EXPERIENCES WITH USE AND NON-USE OF THE MENSTRUAL CUP

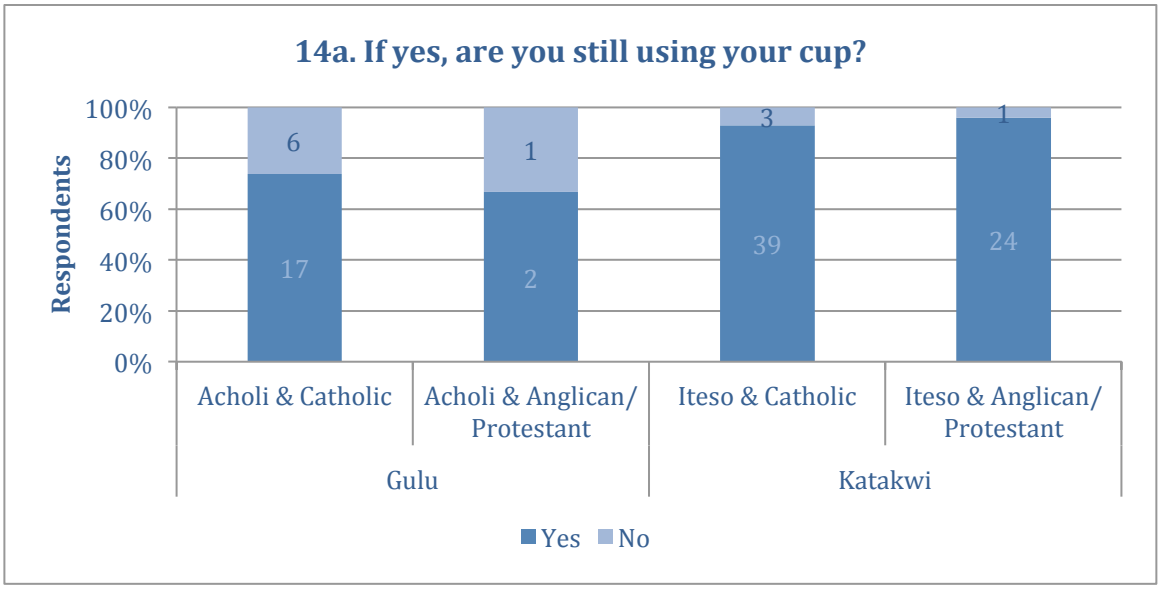
The MC was distributed in Gulu in 2013. It was to be distributed in Katakwi in 2014 but during the MCIFUS in Katakwi it was discovered that more than 40% (n= 30) of the respondents from Katakwi did not receive the MC until 2015 due to miscommunication between DCA, TPO, and WoMena. However, the respondents who received the MC later all tried to use it for several menstrual cycles and they are thus included in the analysis.

Ninety-four percent (n=94) of the respondents reported still having the MC and 87% (n=87) of these girls said they still used it.

Religion does not seem to correlate with the usage of the MC as both Catholic and Anglican/Protestant respondents still use it. Figure 3.5 outlines the respondents' answers to whether or not they still use the MC, divided by the main religions and main ethnicities.

[15] Questions 13 and 14: **13.** *Do you still have your menstrual cup?* **13a.** *Did you use a menstrual cup during your last period?* **13b.** *If no, why not?* **14.** *Did you ever try to use the menstrual cup?* **14a.** *If yes, are you still using your cup?* **14b.** *If no, why not?*
[16] Questions 22 and 23: **22.** *What do you like about using the menstrual cup?* **23.** *What do you not like about using the menstrual cup?*

FIGURE 3.5: RESPONDENTS STILL USING THE MC DIVIDED ON RELIGION AND ETHNICITY



Educational level does seem to affect the usage of the MC. More than twice as many respondents (n=6) who have not finished primary school have also stopped using the MC compared to the respondents who finished primary school and stopped (n=2) and the respondents who have not finished secondary school and stopped using the MC (n=3). Thus, the tendency is that the lower the educational level, the poorer the adoption of the MC, though it cannot be concluded that educational level influenced the reasons for losing the MC as is the case for six of the overall respondents.

Of the 6% (n=6) who lost their MC, two say they lost it to rats, one had it stolen from her, one dropped it in the latrine and another dropped it in the mud. One lost it in a house fire.

Thirteen percent (n=13) of the respondents said they do not use the MC anymore. The reasons stated for most respondents were that it was difficult to clean or difficult to insert/remove.Of the 13 respondents, seven responded *other*. Looking into these responses, it was found that two respondents had the MC spoiled by rats, one lost it in a house fire, and one dropped it in the latrine pit. These responses all match the reasons stated by the respondents who lost their MC. Furthermore, one respondent was pregnant, one had forgotten it in a neighbouring district and one lived at boarding school and could not access a place to boil it, so she only used it when at home. In the latter regard, it is worth noting that two

other respondents attended the same boarding school. However, these respondents did not express similar difficulties with boiling the MC. The reason might be, that the respondent felt shy boiling the MC in a rather public place.

3.4.2 OVERALL PERCEPTION OF USING THE MENSTRUAL CUP

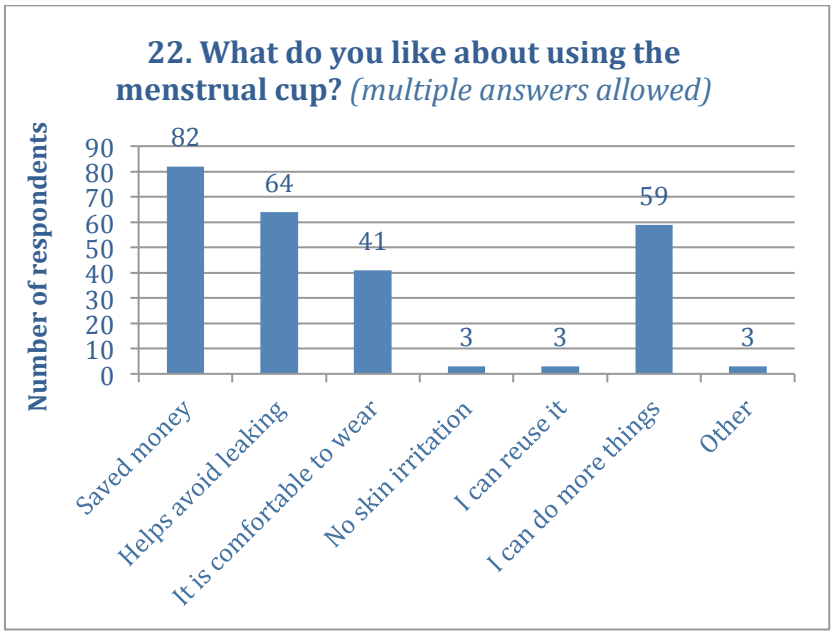
The respondents' general perception with using the MC was positive. Figure 3.6 shows the reasons for liking the MC.

Overall, 75% (n=75) of the respondents say that there is nothing they dislike about the MC and the main thing the other respondents disliked was the difficulty of inserting and removing it (n=25). Only 5% (n=5) disliked it because their family or friends disliked it.

No respondents experienced problems with finding a private place to empty the MC, as they neither found it uncomfortable to wear.

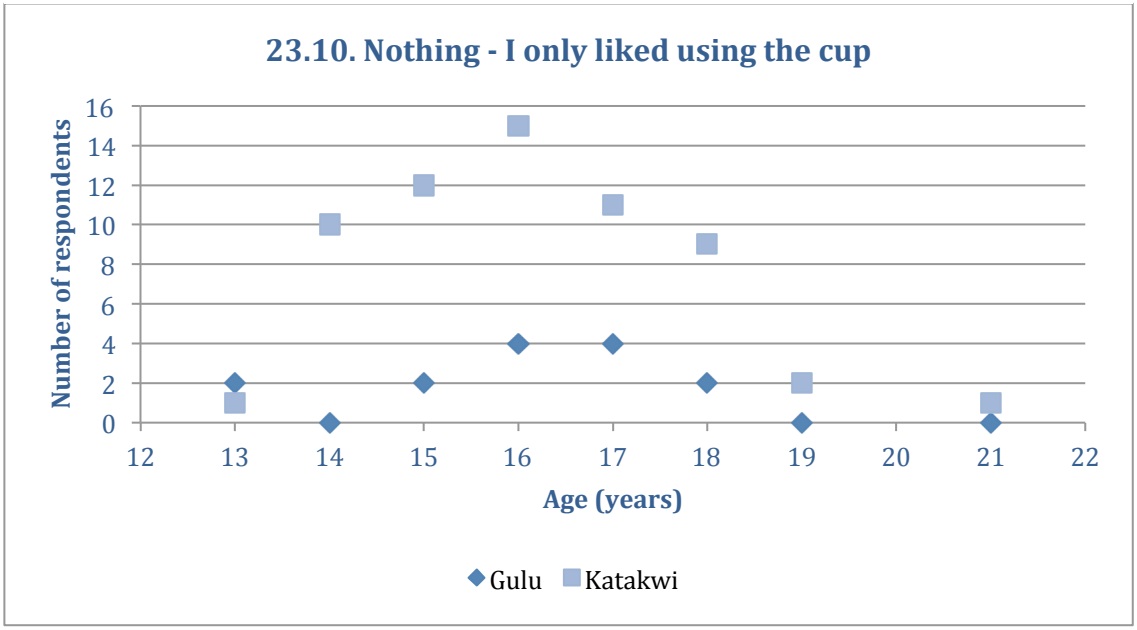
The main reasons for liking the MC were that the respondents saved money (n=82), that it helped them avoid leakage (n=64), that they could do more things (n=59), and that the MC is comfortable to wear (n=41).

FIGURE 3.6: LIKES FROM USING THE MC



In Gulu, less than 50% (n=14) *only* liked using the MC while this is more than 85% (n=61) for the Katakwi respondents, see figure 3.9[17]. Thus, the tendency is that the perception of the MC is affected according to the region the respondents live in. According to figure 3.7, age was not related to this, as the distribution seems equal between sites. The reasons for this are unclear. It could be because of cultural differences related to the different ethnicities in the two sites. It could also just be due to coincidence. The small sample size makes this difficult to assess.

FIGURE 3.7: SCATTER PLOT OF RESPONDENTS *ONLY* LIKING THE MC



3.4.3 COMPARISON BETWEEN CONTINUED AND DISCONTINUED MENSTRUAL CUP USE

The statistical analysis done for this comparison was a logistic regression analysis as described in chapter 2. Table 3.3 outlines the results from the analysis.

Using the OR and a CI of 95%, a comparison between continued and discontinued MC use was made based on the socio-economic characteristics of the survey respondents. Overall, statistical significance in the comparisons was only found for the ethnicity and research site variables[18] (OR 0.2; CI 95%: 0.1-0.6; p=0.01 for both), meaning that if the respondent was from Gulu/was Acholi the likelihood of her continuously using the MC was only 20%.

[17] The number **23.10** relates to **question 23:** *What do you not like about using the menstrual cup?* **Response option 10:** *Nothing – I only liked using the cup*

[18] It being these two variables matches the fact that ethnicity is overall divided on research site.

TABLE 3.3: COMPARISON BETWEEN CONTINUED AND DISCONTINUED MC USE BASED ON SOCIO-ECONOMIC VARIABLES

		Continued MC user N=87 (87%)		Discontinued MC user N=13 (13%)			
		N	%	N	%	Crude OR (CI 95%)	P-value[a]
Age	Less than 16	38	38.0	2	2.0	4.3 (0.9-19.9)	
	16 and above	49	49.0	11	11.0	1.0 (referent)	0.07
Marital status	Married	1	1.0	1	1.0	0.15 (0.01-2.9)	
	Unmarried	83	83.0	12	12.0	1.0 (referent)	0.25
	Missing	*3*	*3.0*	-	-		
Children	Yes	6	6.0	0	0.0		
	No	80	80.0	13	13.0	Invalid	>0.99
	Missing	*1*	*1.0*	-	-		
Level of education	Finished primary	36	36.0	5	5.0	0.9 (0.2-2.9)	
	Not finished primary	48	48.0	6	6.0	1.0 (referent)	>0.99
	Missing	*3*	*3.0*	*2*	*2.0*		
Religion	Catholic	59	59.0	9	9.0	0.5 (0.1-2.2)	
	Protestant/Anglican	26	26.0	2	2.0	1.0 (referent)	0.50
	Missing/omitted	*2*	*2.0*	*2*	*2.0*		
Ethnicity	Acholi	19	19.0	8	8.0	0.2 (0.1-0.6)	
	Iteso	65	65.0	5	5.0	1.0 (referent)	0.01
	Missing/omitted	*2*	*2.0*	*0*	*0.0*		
Research site	Gulu	21	21.0	8	8.0	0.2 (0.1-0.6)	
	Katakwi	66	66.0	5	5.0	1.0 (referent)	0.01

[a] Fisher's exact test.

Even though this is significant, the small sample size makes it difficult to assess the actual effect of these variables. This does not mean that they are not of meaning though. Additionally, the features within the Acholi ethnicity or Gulu community that connects to the lesser likelihood of continued usage are difficult to assess. There could be several cultural aspects that make the Iteso respondents continue using the MC over the Acholi respondents. An argument could also be, that twice as many respondents from Gulu (being Acholi) lost their MC (n=4) compared to respondents from Katakwi (being Iteso) (n=2).

Unfortunately, no other results showed statistical significance and it is thus difficult to assess any correlations between the socio-demographic characteristics and the continued or discontinued use of the MC. This means that no conclusions can be made based on the bivariate analysis. As mentioned, this might be due to the small sample size.

3.4.4 SUMMARY OF FINDINGS IN THE SURVEY

Overall, the usage and perception of the MC were good. The findings in the survey related to usage of the MC showed that 94% (n=94) still had it and that 87% (n=87) still used it. Furthermore, the survey findings showed that religion did not affect the use. Educational level did seem to affect the MC use, however. Thus, more than twice as many respondents who had not finished primary school had stopped using the MC compared to respondents with a higher level of education.

Additionally, the perception of the MC was positive. Seventy-five percent (n=75) had no dislikes related to the MC. The reasons for liking it were mainly that the respondents saved money, that it helped them to avoid leakage, and that they could do more things.

Finally, the statistical analysis comparing the continued/discontinued usage of the MC based on socio-economic characteristics found that being from Gulu/being Acholi decreased the likelihood of continued to use of the MC. No further conclusions could be made on behalf of the analysis since the remaining results showed statistical insignificance.

3.5 ADDITIONAL FINDINGS IN THE SURVEY

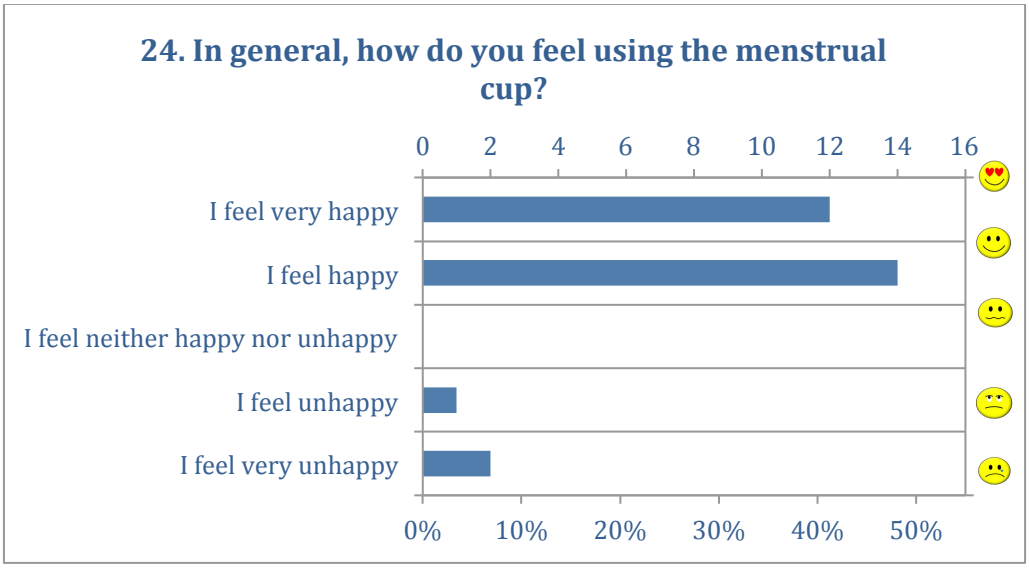
This section outlines the additional findings from the survey, which include findings on acceptance of the MC from Gulu.

3.5.1 ACCEPTABILITY OF THE MENSTRUAL CUP - GULU

For the Gulu survey, two additional questions (questions 24 and 25)[19] were added to the questionnaire. These questions related to acceptability of the MC. As described in section 2.5, the respondents were asked how they felt about using the MC in general using a five point Likert scale (see figure 2.6). Additionally, they were asked whether they would recommend it to a friend. More than 89% (n=26) felt either happy (n=14) or very happy (n=12) about using the MC. Three percent (n=1) of the respondents felt unhappy and 7% (n=2) respondents felt very unhappy about using it, see figure 3.8. All 29 respondents (100%) from Gulu replied that they would recommend the MC to a friend.

Overall for Gulu, the tendency is that the acceptability of the MC is high suggesting that it serves as a sustainable tool to menstrual management.

FIGURE 3.8: ACCEPTABILITY OF THE MC



[19] Questions 24 and 25: **24.** *In general, how do you feel using the menstrual cup?* **25.** *Would you recommend using the menstrual cup to a friend?*

3.6 CHARACTERISTICS OF INFORMANTS

Overall, the informants share the characteristics with the respondents, as they are a sub-sample of the survey respondents. Specific characteristics of the informants are outlined below.

The age of the informants ranged from 13 to 18 years.

Two (20%) of the informants had one child, both of them from Gulu. None of the informants were married.

Fifty percent (n=5) of the informants had finished primary school but not advanced to secondary. This was the case for only one of the informants (10%). Thirty percent (n=3) had not finished primary school. Information on educational level was missing for one informant (10%).

Eighty percent (n=8) of the informants were Catholic, while 20% (n=2) were Anglican/Protestant. All Anglican/Protestant informants were from Gulu.

3.6.1 MENSTRUAL CUP USE

When asked in the interviews, 20% (n=2) of the informants were discontinued users but still had the MC. Fifty percent (n=5) had lost the MC but liked using it. This meant that the informants included five out of the six respondents who, according to the survey data, lost the MC. This coincidence led to looking at the informants' responses in the survey. It was then found that two of the informants who in the interviews stated that they lost the MC, stated in the survey that they still had it and even that they used it during their last period. Both said in the interview that the MC was stolen from them. The reason for this finding was unclear and could have multiple answers. Maybe the informants actually lost the MC but did not dare to say so when asked by the interviewer in the survey. Maybe they still had the MC but hoped to receive another for them to sell, as these informants also described how peers had sold their MCs off. Finally, it is also possible that this is an error related to the execution of the survey.

3.7 FINDINGS IN THE INTERVIEWS

In the following, results from the interviews are outlined.

First, an overview of the categories (figure 3.9) and a table (3.4) with the pseudonyms, age, MC status, and research site is outlined. Then, results from the deductive and inductive categories and subcategories are presented. Finally, a brief summary of the findings from the interviews is presented.

FIGURE 3.9: OVERVIEW OF CATEGORIES AND SUBCATEGORIES

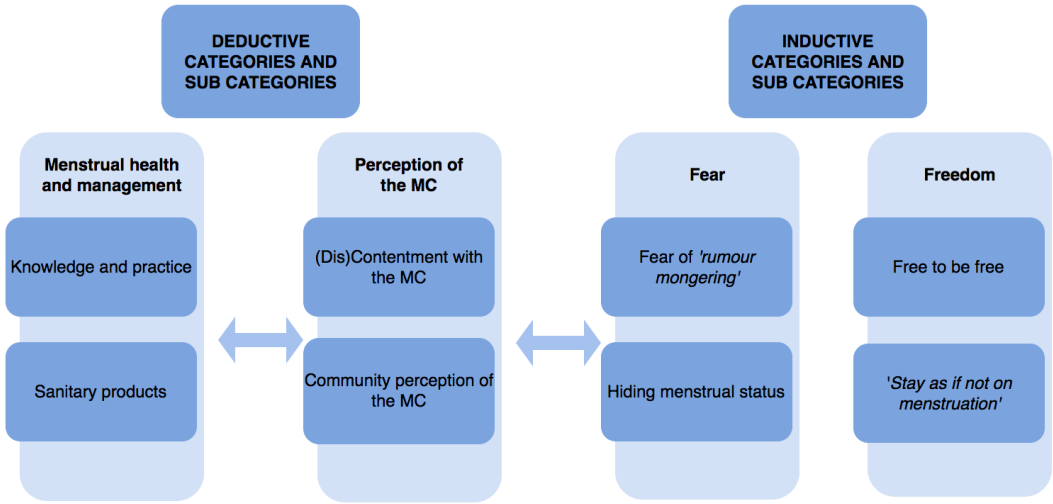


TABLE 3.4: OVERVIEW OF PSEUDONYM, AGE, MC STATUS, AND SITE

Name	Age	MC status*	Site
Josh	18	Discontinued	Gulu
Prossy	16	Discontinued	Gulu
Stella	16	Discontinued	Gulu
Eunice	17	Discontinued	Gulu
Prisca	17	Continued	Gulu
Patricia	14	Continued	Katakwi
Dianah	17	Discontinued	Katakwi
Joyce	13	Discontinued	Katakwi
Mercy	16	Continued	Katakwi
Gertrude	19	Discontinued	Katakwi

*According to interviews

3.7.1 DEDUCTIVE CATEGORIES

This section outlines the results from the categories and subcategories identified from coding the qualitative data material deductively. Categories were developed based on the results from the systematic literature review (see section 3.1) and the results from the quantitative data material (see section 3.4). The categories are *Perception of the menstrual cup*, and *Menstrual health and management*.

3.7.1.1 PERCEPTION OF THE MENSTRUAL CUP

Perception was identified as a category due to the findings related to MC perception and acceptance from the literature review, and from the quantitative findings of acceptability of the MC from Gulu (see section 3.5.1). The category includes narratives related to the overall perception of using the MC. The category also embraces community perception of the MC and the narratives related to acceptance or rejection of it. The category is divided into two subcategories: *(Dis)Contentment with the menstrual cup*; and *Community perception of the menstrual cup*.

(DIS)CONTENTMENT WITH THE MENSTRUAL CUP

Overall, most informants felt content with the MC and thought of it as being *'good'* and *'easy'* to use. Good because it did not *'allow blood to leak'* and easy because it did not need emptying as often as sanitary pads need changing. The MC was seen as a tool to help the girls remain clean during their menstruation. This resembles the findings in the articles in the literature search (Beksinska et al. 2015b; APHRC 2010; Mason et al. 2015) as well as the additional findings in the survey, where more than 89% of the Gulu respondents felt *'happy'* or *'very happy'* with using the MC. Most narratives that mentioned difficulty from using the MC were related to the first insertion or removal where most informants described pain related to the initial insertion and/or removal of the MC. All but two of the informants described that the pain related to the MC reduced over time, as they got familiar with using it. The MC became comfortable to use because it *'became used to your body'*,

The initial reaction to the MC was a fear that it was going to be too big for them to insert or that it would be difficult to use. According to the informants, familiarity and experience made it easier for them to use the MC and there were then no challenges related to using it.

> What I like most is that it's easy to use because
> at first I thought it was difficult to use, yet it is good
> and easy to use
> *(Joyce, 13 years. Katakwi)*

> […] on that very first day, like every new thing,
> that day was quite hard but I got used to it with
> time and right now have no issues using it.
> *(Patricia, 14 years. Katakwi)*

COMMUNITY PERCPETION OF THE MENSTRUAL CUP

The community and peer opinions about the informants using the MC were diverse. Overall, the informants' close relatives were most often positive towards the MC. They found it useful, helpful, and good, though it was not clear in what particular ways. There was also support from one informant's male relative and the notion seemed to be that the MC helped the families to save money from buying sanitary pads. The community of one informant thought that it was good that '*they brought it [MC] to help children'* (Prisca, 17 years. Gulu). Furthermore, informants often explained that their peers wanted the MC too and kept asking if they could share it. No informants had agreed to share the MC, as this was advised against due to the risk of infections.

Other informants had experienced different reactions to the MC, such as female peers who dismissed it due to misinformation and mistrust in the community. This mistrust was aimed both at the MC and at the people/organisation bringing it. Girls had thought of the MC as useless or disease infectious and people in the communities had said that the MC was only for women who already had given birth, that it could make the girls infertile or that it was a way for white people to kill African people. Informants from Gulu, where the mistrust and rejection was more pronounced, knew girls who had sold off their MCs or thrown them away because they were *'shaming'* objects.

> […] the people used to say that the cup, when you
> insert it (…), sometimes it will go and (…)[it]
> will not let you give birth. To get pregnant.
> Others were saying that maybe that is the way the white
> people they want to kill us Africans and also [starts laughing]
> and also they used to assume that maybe this thing when
> you (…) insert it inside you it will go (…) and
> it will kill you straight away.
> *(Prossy, 16 years. Gulu)*

The informants from Gulu tended not to engage in negative discussions about the MC. They *'kept quiet'* and decided to use it despite the community mistrust because they found the MC useful.

The suspicions, misconceptions and rejections in communities might stem from lack of knowledge about the MC, as it is an uncommon menstrual management method.

> […] they ask me about the size saying "is it as big as the cup we use for taking water?"
> *(Gertrude, 19 years. Katakwi)*

3.7.1.2 MENSTRUAL HEALTH AND MANAGEMENT

MHM as a category was identified deductively to include narratives from the informants that match the findings from the literature review regarding menstrual knowledge and practice. The category includes narratives of the informants' menstrual knowledge, menstrual practice, and their perception and use of other menstrual management method than the MC. It also includes narratives of the informants' perception of menstruation and sharing this subject with others. Additionally, it includes statements related to school absence due to menstruation. The category is divided into two subcategories: *Knowledge and practice*; and *Sanitary products*.

KNOWLEDGE AND PRACTICE

Overall, the conducted interviews addressed both menstrual perceptions and practices, however perceptions of menstruation were more prominently present in the informants' responses. The perception was that menstruation is a good thing that is supposed to happen to girls and women and that it is ok to talk about it to other females, even if it makes one of the informants feel *'shy'*. Though menstruation is perceived to be something to keep private, talking to other women, such as female relatives or peers, about menstruation is considered ok. On the other hand, talking to boys or men about menstruation is considered inappropriate because they *'may not know what is happening in you'* (Eunice, 17 years. Gulu). One informant thought of menstruation as something good but at the same time something that should not be talked about, as it is *'bad to listen to'*. There seems to be a 'menstrual etiquette' maintained within the community by the women themselves.

> This thing [menstruation] is not good for boys. Better to

> discuss it with your fellow girl who […] also goes through [it].
> […] it is good to tell the girls, not the boys.
> *(Prisca, 17 years. Gulu)*

The informants' knowledge about menstruation was only present in a few interviews. Two informants explained that they knew about menarche and menstruation in advance and that their mothers had said that menstruation is normal, should be expected every month, and that they *'should not be afraid of asking any questions'*. These informants were from Katakwi.

One informant expressed that she knew nothing of menstruation or menarche before it happened.

> When I first started menstruating I was ignorant about it.
> I went and showed her [mother], she said, "you have now
> started menstruating". I asked her what menstruation is.
> She said, "the blood that flow every month from a woman".
> *(Eunice, 17 years. Gulu)*

The level of knowledge about menstruation that the informants had received from home seemed to be differing from family to family, which must be considered normal.

Narratives related to menstrual practice were also few. One informant shared how her grandmother taught her to manage her menstruation when not having sanitary products available.

> […] [grandmother] told me that in case I started
> experiencing [menstruation] maybe I could use
> a handkerchief […] and I fold it like two
> to three times and then I put it in my knickers […]"
> *(Prossy, 16 years. Gulu)*

When menstruating, what seemed important to the informants was to keep clean and bathe frequently to avoid leakage and bad smell. Also, bathing before doing chores or other activities was considered good menstrual practice. Remaining standing when menstruating due to lack of sanitary products was considered normal, though uncomfortable. Three informants said that they used to miss school due to menstruation issues.

> I used stay at home for three days because those
> are the days I am in my period. Then I get back
> to school after those three days.
> *(Patricia, 14 years. Katakwi)*

SANITARY PRODUCTS

Most informants found the usage of other menstrual management methods hard or difficult compared to the MC. Informants stated, that when using sanitary pads there was a more frequent need to bathe and change compared to the MC.

Statements were made of the limitations faced, such as walking, biking or travelling, during a period when no sanitary product was available. This included how that made them feel. Experiences of painful chafing related to the usage of sanitary pads, cotton cloth or when not using any product were also described.

> Walking will be hard because between your [thighs] will be sticky as you walk. Within a short distance, you will develop wound and [be] sore there. […] If I don't walk, I feel like it is not nice to be myself.
> *(Eunice, 17 years. Gulu)*

Sanitary products are considered to be expensive. Furthermore, leakage and chafing from using sanitary pads or cotton cloth was a concern and made the informants prefer the MC to other types of menstrual management methods.

> When using pads [they] leak but the cup is good especially for those who have over flow of blood since it does not leak.
> *(Josh, 18 years. Gulu)*

3.7.2 INDUCTIVE CATEGORIES

This section outlines the results from the categories and subcategories identified in the process of inductively coding the qualitative data material. Categories emerged during an iterative process initially based on the interview guide (see appendix III). The categories are *Fear* and *Freedom*.

3.7.2.1 FEAR

Fear as a category was identified from the inductive coding process as a sum of narratives describing issues that all related to fear as an overarching category.

Narratives in this category described informants' perceived and experienced fears related to menstruation and menstrual management. This includes fears created by myths, or vice versa, about menstruation, as well as misconceptions or misinformation about the MC. The category is divided into two subcategories; *Fear of 'rumour mongering'*; and *Hiding menstrual status*.

FEAR OF 'RUMOR MONGERING'

The overall permeating fear related to menstruation was the fear of rumours, gossip and name-calling from the community, especially peers and other pupils. One informant used the term *'rumour monger'* when she was asked what would happen if someone were to know about her on-going menstruation.

Rumours related to menstruation had occurred to several informants personally in both Gulu and Katakwi. The informants who had experienced gossip and name-calling felt less confident and one informant kept to herself after it happened. Other informants only feared the risk of being called names or gossiped about. The feelings related to being victim of rumour mongering were described as *shameful, bad* or *name spoiling*. It seemed that the fear of rumours was more prominent in Gulu.

> […] they [the people knowing about the menstruation] will
> shout with your name, you will realise that your name is
> everywhere. Everybody will be talking about you.
> *(Eunice, 17 years. Gulu)*

The fear of rumours was expressed both related to menstrual leakage or staining and to people noticing that the informants emptied the MC, thus girls went back to their homes to empty it. Many latrines at the schools did not have doors that could shield the girls properly when emptying the MC. It remained unclear whether any of the informants had been seen while emptying the MC. Hence, there is a chance that this was mostly a perceived fear.

Having an object like the MC that needs to be inserted into the vagina in a community that is sensitive to issues related to sexuality, combined with teenage girls that may feel self-conscious and awkward, makes it understandable that the informants wished to not be seen removing and re-inserting the MC.

> "It is bad because everyone keeps saying,
> 'huh, look at what that girl [is] doing'"
> *(Stella, 16 years. Gulu)*

Leaking or staining during menstruation was also a reason for 'rumour mongering' and it made the informants feel *'shameful'*. According to the informants, the staining was likely to create a feature of identification for girls.

> I fear because (…) they (…) stigmatise you
> with it. When the stain comes out,
> it is (…) kind of stigma. They know you
> with that. […] "this one is the person who had blood
> the other time", so even these young kids would start
> following you and disturbing you and saying bad things about you.
> *(Prossy, 16 years. Gulu)*

The feelings of the informants connected to leakage or staining were feelings of constant concern or not *'feeling easy'* with themselves around other people when experiencing their period.

As already described, several informants from both Gulu and Katakwi reported that they sometimes chose to stay home from school during their entire period because of the fear of rumours or gossip if they had a menstrual stain.

> Assume that you are seated and not bothered then you
> realize that the all of your dress is stained with blood […]
> That makes life very hard.
> *(Stella, 16 years. Gulu)*

HIDING MENSTRUAL STATUS

The fear of others knowing about the informants' on-going menstruation was founded in the fear of 'rumour mongering' and it was a large concern that made them go to great lengths to hide the fact that they menstruated, as far as to stay home from school completely. It also led to a lack of focus and concentration when in school, as the informants would leave the classroom often to check that no leakage or staining occurred but then leading to the fear that the constant leaving the class would make peers suspect an on-going menstruation. There was a perceived fear that the community would suspect an informant being on her period by her behaviour, such as bathing more frequently, having mood swings or menstrual cramps. It was important to the informants to act as usual and not show signs of *'weakness'* due to i.e. cramps because it could reveal their menstrual status and be used against them.

> When I am in my periods, I keep it secretively […]
> it's only you who knows that you are in your periods.
> *(Mercy, 16 years. Katakwi)*

Besides the immediate fear of people knowing about them menstruating, the informants also expressed fear of witchcraft connected to menstruation. In Gulu, two informants unrelatedly and reluctantly expressed this fear and one informant's mother had told her to keep her menstruation a secret because people would *'do something'* to her. What this *something* entailed was unclear but it could be sexual harassment, violence or infertility by witchcraft.

> There are some people who cannot be
> trusted, they take and hide it [menstrual blood] […] I heard
> that (…) you [then] will never be in position to give birth.
> *(Stella, 16 years. Gulu)*

3.7.2.2 FREEDOM

The category *Freedom* was identified as narratives that all related to the subjective sensation of freedom related to using the MC. It was the most prominent category and all informants from both Gulu and Katakwi used the word *free* or *freely* at

some point during the interviews. Overall, the category outlines how the MC helped the informants to feel free from menstruation related issues, such as i.e. leakage, staining, chafing, and rumours. The category includes informants' experience/statements about freedom related to MC use. The category is divided into two subcategories: *Free to be free*; and *'Stay as if not on menstruation'*.

FREE TO BE FREE

The informants described how the MC let them *stay freely*, *relaxed*, and *without fearing* compared to how they felt when menstruating before they received the MC. They sometimes even forgot being in their periods, as the MC did not leak nor was it felt physically once inserted into the vagina. The informants explained how they were no longer ashamed, did not feel chafing, and *'only felt happy'*. Furthermore, the MC helped the informants keep their menstrual status a secret and they could *'stay in the public and nobody will notice that [they were] menstruating'* (Eunice, 17 years. Gulu). The MC allowed the informants to act like they would do when not in their period.

> **Interviewer:** How do you feel when you are using the menstrual cup?
> **Informant:** [*sighs*]… I feel good. […] If my period is there, I live like I do all the other days. […][*Laughs*] I feel just free. […] the cup alone makes me feel easy and I stay free […] That is the goodness of this cup to me.
> *(Prisca, 17 years. Gulu)*

Money for sanitary products was not always available when *'days are dry'*. Having been given the MC was related to a sense of financial liberty, since the informants no longer needed to ask for or spend money to buy sanitary products, which was verbalised by several informants from both research sites. The MC *'saves your life'* and provided the informants with independence and they expressed that it was a comfortable way to keep their menstrual status private.

> Why would I waste time buying pads when there are Ruby [MC brand] cups?
> *(Mercy, 16 years. Katakwi)*

'STAY AS IF NOT ON MENSTRUATION'

The informants described how the MC helped them to stay natural and relaxed among their friends and peers, not fearing that someone would notice them menstruating and start 'rumour mongering' or gossiping. This included being able to happily attend school when menstruating, something informants described abstaining from during their period.

Almost all informants mentioned the freedom the MC gave them when it came to doing everyday activities like walking, playing or doing chores when experiencing their menstruation. Many informants expressed the feeling of relief that the MC provided from leakage and staining and this made them worry less. Riding a bicycle was frequently mentioned as an activity that the informants were able to do in their periods after receiving the MC probably because riding a bike without a sanitary product will stain their clothes.

> I can stay freely […] I can put it [MC] and ride a bicycle because I stay as if I am not on menstruation. […] no stain will touch your knickers. You will find them as clean as [when] you put it on […] I talk and mix freely with people; I take water jerry can to the water source and fetch water without any problem.
> *(Eunice, 17 years. Gulu)*

Informants also experienced travelling to be easier and the MC would be *'put in the bag'* because menstruation can start '*abrubtly*'. The MC becomes a 'safe keeper' to the girls, a tool to maintain the 'menstrual etiquette'.

Staying as if not on menstruation because of the MC allowed the informants to keep their menstrual status secret and provides them the spatial mobility that, in rural areas, according to Jewitt & Ryley (2014), can be limited due to menstruation.

> I can go to the centre, play well and it has removed all the fear away […] All things are easy to do. Especially going to school. I can't miss a day when I'm in my periods because I do even forget [I'm] in them.
> *(Joyce, 13 years. Katakwi)*

3.7.3 SUMMARY OF FINDINGS IN THE INTERVIEWS

The general perception of the MC was good among the informants and acceptance came along with familiarity and experience. The communities seemed to have more diverse opinions of the MC. Furthermore, general access to proper menstrual management methods besides the MC was lacking according to the informants. The findings in the interviews showed contentment and freedom from using the MC. Many informants said that when using the MC they did not feel like anything was going on in their bodies and they even forgot that they were menstruating.

The interesting findings were the narratives on fear and freedom. Menstruation seemed to be viewed as something shameful and something that needed to be hidden away. According to the informants, menstruation was a taboo and being known as a menstruating girl could lead to 'rumour mongering' in the communities. Thus the informants explained how they would go to the extreme of

staying home from school when menstruating due to the fear of staining their clothes and becoming victim of rumours. The MC would help them act and do as usual, which seemed of great importance to the informants. Overall, it seemed to be agreed that the MC was a sustainable menstrual management tool.

Additionally, the findings in the interviews showed congruence with the findings in the survey when it came likings of the MC. According to the respondents, they liked the MC because it helped them to save money (82%; n=82), avoid leakage (64%; n=64), and do more things (59%; n=59). Furthermore, the findings also showed congruence with the existing literature from the literature review on spatial mobility, lack of MHM and SRH knowledge and facilities, school absence, and menstrual management methods.

3.8 SUMMARY OF RESULTS

Overall, the findings of the literature review showed a general lack of evidence and knowledge in the field of MHM though there seemed to be consensus from the researchers on the importance of menstrual management on girls' lives. Additionally, there seemed to be a tendency towards menstruation leading to increased school absenteeism though this was not significant and studies found that girls' knowledge on SRH and menstrual management was poor.

Furthermore, the survey found that 87% (n=87) of the respondents still used their MC one to three years after receiving it. The general acceptance of the MC as a menstrual management method was high, since 75% (n=75) did not have any dislikes about the MC. Additionally, continued usage of the MC was conditioned to some extent by the ethnicity of the respondents, as the likelihood of continuously using the MC was lower for the respondents from Gulu, compared with Katakwi (OR 0.2, CI 95% 0.1-0.6).

Finally, the study found that perception and experience of the MC to be good with the informants but varying with the communities. The study found a permeating feeling of fear related to menstruation among the informants. This fear was mainly founded in the fear of 'rumour mongering' among peers and within the community. The MC on the other hand, led the informants to feeling free and able to interact, as they would do when not experiencing their menstruation. The findings in the study aligns with the findings from the literature review.

4.0 DISCUSSION

This chapter contains the discussion, recommendations, and the conclusion of the study. Firstly, a discussion of the overall findings in the study is made. Secondly, the new understanding of the research field is outlined. Thirdly, a methodological evaluation is made based on the design and methods used to conduct the study. Fourthly, suggestions for further research are presented followed by the recommendations for the future. Finally, the conclusion of the study is presented.

4.1 OVERALL DISCUSSION OF FINDINGS IN THE STUDY

In the following section, findings from the study will be discussed in relation to the findings from the literature review in order to see if an aligned result can be reached.

4.1.1 THE PHYSICAL AND SOCIAL IMPACTS OF MENSTRUATION

The literature review showed that shame and physical limitations follow menstruation (McMahon et al. 2011; Jewitt & Ryley 2014; Mason et al. 2013; Sumpter & Torondel 2013; Hennegan & Montgomery 2016). The informants in the interviews stated similar experiences of limitations such as not travelling when lacking access to sanitary products or staying home from school when on their period. Furthermore, the literature review found that schoolgirls feared leakage when menstruating. They were afraid of rumours and name-calling from peers and even teachers (Boosey et al. 2014; Jewitt & Ryley 2014; Mason et al. 2013; McMahon et al. 2011; Mason et al. 2015; Gultie et al. 2014b). This was also an issue among the informants in the interviews. The pervasive fear of the informants was the fear of rumour mongering, which was most likely to happen if people knew about their on-going menstruation or if the girls leaked during their menstruation and thus stained their clothes for everyone to see. The respondents in the survey indirectly backed this up, as 64% stated that one of the reasons why they liked using the MC was that it helped them to avoid leakage. The study findings indicate that menstruation in rural Uganda is related to fear of rumours and name-calling, which is backed up by the existing literature. This suggests that the findings are general menstrual related issues existing in LICs. Additionally, the study findings indicate that the MC has the ability to relieve the girls from these fears and help them feel free to do things they would otherwise do when not on their period.

4.1.2 MENSTRUAL MYTHS AND THE MENSTRUAL CUP

The literature review found that lack of parental support combined with cultural myths affected the menstrual management practice of adolescent girls negatively (Sommer, Ackatia-Armah, et al. 2015). The informants in this study revealed similar experiences. Rejection of the MC happened more often in settings where myths about menstruation were pronounced and where the community seemed

less accepting of the MC. The survey found that less than 50% of respondents from Gulu only liked using the MC while the relating figure in Katakwi was more than 85%. In Gulu, myths about the MCs had led to girls throwing them away or to selling them off. This indicates that the individual's acceptance of the MC is affected by the community perception and the culture surrounding these communities. However, the informants from Gulu also described how they continued using the MC despite the community opinion, which is in line with what Mason et al. (2013) found, namely that adolescent girls are resourceful and can gain power over their bodies if they are provided with solutions.

The articles on acceptance of the MC by Beksinska et al. (2014), APHRC (2010), and Mason et al. (2015) all showed high acceptance with usage of the MC in low-income settings in Kenya and South-Africa. This survey showed similar tendencies in rural Uganda. Eighty-seven percent of respondents stated that they still used the MC and 89% felt either *'happy'* or *'very happy'* with using it. Informants also revealed positive feelings with using the MC. They stated that it helped them feel free, relaxed, and comfortable and that it is good and easy to use. The MC helped them to forget that they were menstruating and allowed them to remain, as they would do all other days. Compared to other sanitary products, the informants overall found the MC better to use, as it did not leak, which helped them to keep their period invisible to others; a great concern for many informants.
Overall, the MC findings from this study match the findings from the literature review on the MC, suggesting that it has potential to act as the menstrual management method that can help adolescent girls to proper and dignified menstrual health.

4.1.3 MENSTRUATION, EDUCATION, AND CULTURE

According to the survey, the educational level seems to affect the usage of the MC, as twice as many without primary level education stopped using the MC compared to girls with primary school education or above. None of the three articles about the MC from the literature review directly address the possible effect of educational level on MC use. However, one article by Sommer et al. (2015), suggests that parental SRH education can affect the menstrual management of adolescent girls and another article by McMahon et al. (2011), showed that proper

MHM and SRH education are factors that have the ability to allow adolescent girls in low-income settings to regain power over their bodies.

The study also found that ethnicity possibly affects continued usage of the MC (OR: 0.2; CI 95% 0.1-0.6; p=0.02). However, this was not tested for confounding factors, which will be discussed later. None the less, the tendency was that respondents with Acholi background were less likely to keep using the MC compared to respondents with Iteso background. This might be due to the cultural differences embedded in the two ethnicities. These cultural differences were not addressed, as they lie outside the scope of this study. However, ethnicity's affect on MHM is in some ways supported by the literature review, as findings from Sommer et al. (2015) show that cultural beliefs can affect menstrual practice of girls in low-income settings.

4.1.4 MENSTRUATION, SCHOOL ABSENCE, AND EMPOWERMENT

Articles by Boosey et al. (2014), Grant et al. (2013), Hennegan & Montgomery (2016), Sommer et al. (2015), and Tegegne & Sisay (2014) all address the issue of menstruation and school absenteeism. Even if the articles found no statistical significance, there was a tendency to girls missing school due to menstruation related issues. Three informants from this study's interviews verbalised that they had stayed home from school due to menstruation related issues, which supports the findings in the literature. The informants also stated how menstruation displays them and makes them feel weak. Revealing their menstrual status could be used against them, so it was kept secret as recommended by the 'menstrual etiquette'. The MC provided the relief that the girls needed to be able to stay freely among their peers without being afraid and without feeling shame. The MC could also act as a tool to become less weak and more equal, as it also provided the informants with a sense of financial liberty. Hence, this indicates that MC can act as an empowerment tool – a 'safe keeper' - for menstruating girls to stay in school and give some relief to the burden that menstruation is to them.

4.1.5 SUMMARY OF OVERALL DISCUSSION OF FINDINGS IN THE STUDY

The study findings indicate that the MC presents itself as a menstrual management method that has several functions for girls in rural Uganda. It can relieve

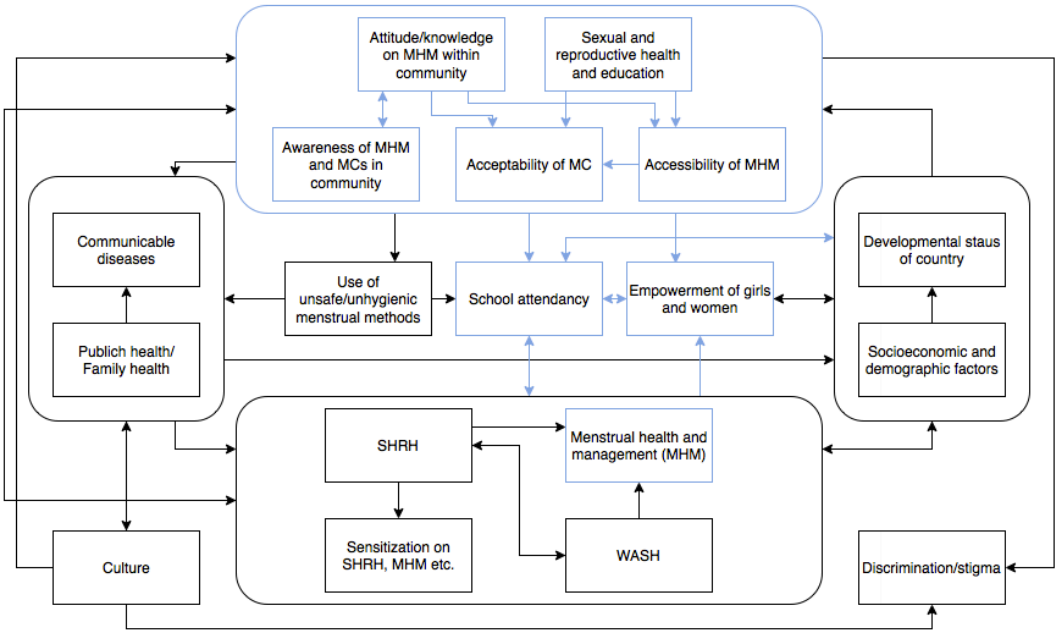
adolescent girls from the fears that menstruation entails for them, help them regain power over their bodies, and free them to remain in school even though they are menstruating. The study also found that culture and community perception of menstruation affect the usage of the MC and the conduct that the girls apply to their everyday life. Furthermore, the study shows tendencies similar to findings from studies in other rural, low-income settings in SSA. Hence, proper, dignified MHM – such as MC use – can empower adolescent girls in low-income settings and help them overcome the burden that menstruation currently put on these girls. Furthermore, the study findings aligns with the existing knowledge on MHM in SSA.

4.2 NEW UNDERSTANDING OF RESEARCH FIELD

In chapter 1, the preliminary understanding of the research field was outlined (see section 1.6). As a result of the analyses throughout this study, the understanding of the research field has changed. The following outlines a discussion of this changed understanding and the implications.

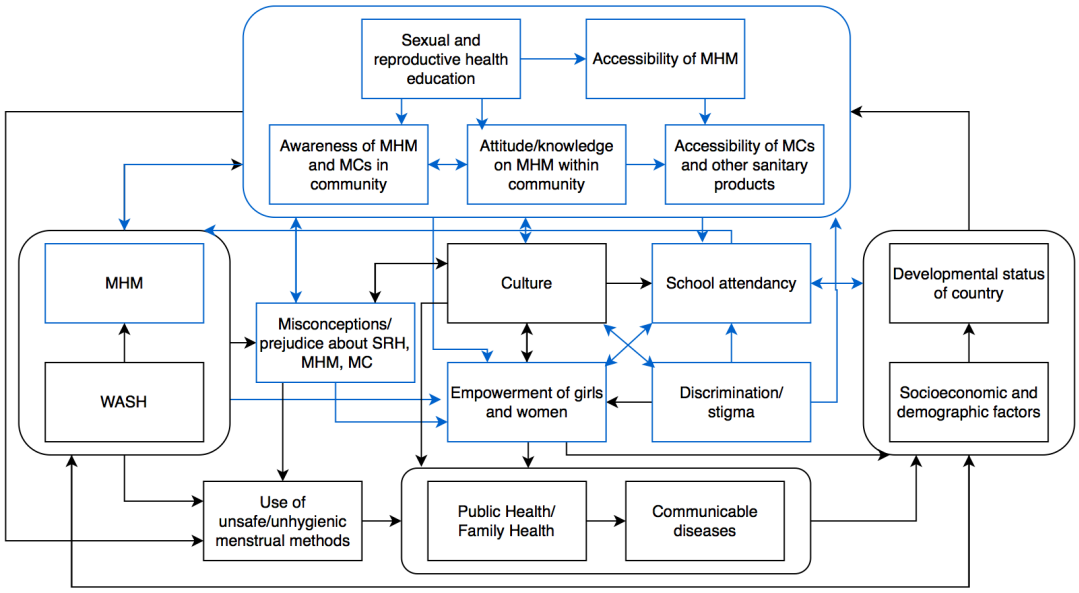
Firstly, the figure of the preliminary understanding of the research field is presented (figure 4.1) and secondly, a new figure displays the new understanding of the research field (figure 4.2).

FIGURE 4.1: PRELIMINARY UNDERSTANDING OF RESEARCH FIELD



In figure 4.2, the boxes lined in blue continue to illustrate the factors related to this study while the boxes in black illustrate factors related to the overall research field. As with the initial description of the research field, they are not addressed, as they do not relate to the scope of this study.

FIGURE 4.2: NEW UNDERSTANDING OF RESEARCH FIELD



The boxes are still interrelated on several levels: international, national, governmental, community, and personal level. The boxes in the middle now represent the essential factors supposedly affecting adolescent Ugandan girls' menstrual management combined with the factors that proper MHM has the ability to lead to. SHR education takes part at a community level, which is displayed in the top box. International, national, and governmental factors are still displayed in the boxes in the sides and now also at the bottom.

The new understanding of the research field has the same entrance point: improving MHM within low-income settings. The MC is considered a sustainable menstrual management method and can become key to achieving dignified MHM. The factors remain closely interrelated and the field of research is more complex than previously depicted. To put focus on MHM, it needs to be included in SHR education. In the light of this study, trying to address the cultural and traditional misconceptions and prejudice of menstrual health within the communities could be a key factor for allowing the MC to become a sustainable menstrual management method. Addressing this could then lead to increased knowledge about MHM, increased school attendance, increased educational level of the adolescent girls, and, over time, a rise in the overall developmental status of Uganda. Acceptance and attitude towards the MC within the communities will then become an integrated factor of MHM at the community level.

Reality remains more complex than outlined above but this discussion exposes the complex field of SRH and MHM research as understood both before and after conducting this study. The new understanding evaluates the importance and significance of research and inclusion of MHM in the field of SRH.

4.3 METHODOLOGICAL CONSIDERATIONS

Overall, the process of this study has been a learning experience when it comes to conducting research in general and especially in a LIC. The methodological choices have had implications for the outcome of the study and some things could have been done differently. Thus, this section evaluates the research methodology.

Firstly, the systematic literature search and the study population are discussed. Secondly, the design is discussed followed by a discussion of the training, piloting, and quality assurance. Thirdly, the quantitative research method is discussed including a discussion on the quality and consistency of the cross-sectional survey, the questionnaire, and the sample. Fourthly, a discussion on the qualitative research method is done including a discussion on the execution of the semi-structured interviews and the data analysis. Finally, the ethical considerations of the study are discussed.

4.3.1 DISCUSSION OF SYSTEMATIC LITERATURE SEARCH

The systematic literature search was conducted according to the PICO-scheme (Higgins et al. 2008b), which helped to structure the search. The search was conducted at a stage in the study process where the search terms related to the limited knowledge of the research field. This means that other relevant search terms could be used if the systematic search was to be conducted again. The limitations in the inclusion criteria excluded potential articles from before 2005. However, evidence suggests that research within the field of MHM has only existed for the past decade (Sommer, Hirsch, et al. 2015) and within this period, knowledge has evolved immensely. Furthermore, the searches in the databases provided large amounts of articles including duplicates of articles, and literature was also identified in the comprehensive literature database of WoMena. Based on this, the systematic search is considered exhaustive in order to discover relevant peer-reviewed articles to investigate research question 1.

4.3.2 DISCUSSION OF STUDY POPULATION

In order to explore the long-term use of MCs, this study only concerned girls who previously were given a MC in connection with the former MCIS or MCI. It is

possible that participants in the MCIFUS mainly include girls that felt they had a positive effect of the MC and the training conducted in relations to the MCIS and MCI. Hence, this study may find an overall more positive attitude towards using MCs than the general perception in the Ugandan society. However, findings from studies about the MC in similar settings also found a high acceptance and a positive attitude towards the MC as a menstrual management method (Beksinska et al. 2015a; Mason et al. 2015; African Population and Health Reseach Center 2010). Hence, the study population in this study does not bias the findings.

Additionally, this researcher's knowledge and understanding of Ugandan culture is limited. It is therefore possible that more thorough knowledge of Uganda and the challenges faced by the population may provide valuable inputs to the perception of the findings from this study and help to see the MC and MHM in a larger cultural and social perspective. The perception of menstruation and the MC may differ in different communities and based on the limited scope of this study, and the fact that evidence about adoption of the MC remains scarce, it is most unlikely that the results can be generalised to other communities.

4.3.3 DESIGN

The overall design chosen for this study was a mixed methods approach and as described by Creswell there are several ways to design a mixed method study. The design for this study was the convergent parallel mixed methods approach (Creswell 2014).

Even though the mixed methods design in this study is commonly applied when doing both quantitative and qualitative research, the convergent parallel mixed methods approach does not combine the two data sources until the discussion section of the study (see chapter 2) (Creswell 2014). Other mixed methods approaches allow the research to combine the two methods in the data collection and/or the data analysis. All approaches have their disadvantages though. Considering both the inexperienced research team and the time restraints that this study was subjected to, the convergent parallel mixed methods approach was considered to be a useful and sufficient method for answering the research questions. Furthermore, this study was a part of the larger MCIFUS, which meant that there additionally were constraints to the designs possible to use.

4.3.4 DISCUSSION OF QUANTITATIVE RESEARCH

This section provides a discussion of the quantitative research. Firstly, a discussion of the choice of conducting a cross-sectional survey is done followed by a discussion of the survey tool. Finally, implications of the sampling technique and the sample size are evaluated.

4.3.4.1 CROSS-SECTIONAL SURVEY

To answer the research question 2, a descriptive, cross-sectional survey was chosen, as it was believed to be an appropriate research method (see section 2.4). Choosing this method was limited by the fact that WoMena had already chosen this method for the MCIFUS. The advantage of the cross-sectional survey is that it is able to reach many respondents in a convenient manner (Bowling 2010). However, as the MCIFUS study aimed to follow up on participants from previous studies/interventions, this naturally limited the number of potential informants. There was also a higher than expected loss to follow up, which as will be discussed later in this chapter.

The survey might also be limited by the fact that SRH in general is an area surrounded by taboo and myths making MHM a difficult field of research. Thus, it is important to remember that the survey results are challenged by the feelings of the respondents related to menstruation and SRH, possibly influencing their responses.

Overall, the cross-sectional survey is considered a proper tool for answering research question 2.

4.3.4.2 TRAINING, PILOTING, AND QUALITY ASSURANCE

Overall, time and budget restraints limited the execution of the study. The fieldwork in Katakwi was conducted in one week for round 1 and three days for round 2, and fieldwork in Gulu was done in two weeks. These time restraints limited the preliminary training of the RAs. Still, training was done along with piloting of both questionnaires and interviews to make the RAs familiar with the tools and give them an opportunity to ask clarifying questions. Additionally, daily debriefings were done to address questions and inconsistencies. However, the data material still showed some inconsistencies and misinterpretations, which could have been minimised through further training and piloting.

Though the final recordings and transcriptions indicated misinterpretations of questions by both the interviewer and the informant, extensive measures were taken during the training to limit these. Thus, the conception is that misunderstandings or misinterpretations cannot be completely diminished.

The study showed some complications related to the conduction of the questionnaire survey and the interviews, as mentioned above and to be elaborated in the following sections. Even so, the execution of this study was overlooked throughout the field visit and daily debriefings with the RAs were made to address questions and possible inconsistencies. Hence, the data material of the study is considered valid and valuable.

4.3.4.3 INTERVIEWER-ADMINISTERED QUESTIONNAIRE

The underlying principle of a structured questionnaire is that the researchers and respondents need to have the same frame of reference, as words and concepts should be interpreted in the same way (Bowling 2010). WoMena has experience when it comes to doing research and interventions in Uganda, but the districts of Uganda are also fairly different from each other with different languages, ethnicities, and cultures. Hence, the translation and interpretation of the original English questions in the questionnaire may differ from site to site leading to inconsistencies in the execution of the survey. This leads to the risk of comparing sites on a disadvantageous foundation.

QUESTIONNAIRE AS A TOOL

The results from the survey showed a level of inconsistency and differing interpretations of some questions by the RAs both within and between the research sites, despite piloting and interpretation training. This led to exclusion of results from socio-economic questions number 6-8 [20] as the results were inconsistent. Using an already developed and validated instrument would have increased the internal validity, as already validated tools have been thoroughly and repeatedly tested in the population they were designed for and on the topic they are supposed to measure, such as i.e. questionnaires measuring quality of life (Bowling 2010). The problem in this regard is that no existing instrument covers

[20] Questions 6-8: **6.** *How many rooms are there in your household?* **7.** *How many people are there in your household?* **8.** *Who do you currently live together with?*

the field of MHM yet. Thus, the tool used for this study is considered to meet the aims of the MCIFUS, which was to evaluate the overall long-term usage of the MC. Since this was a precondition for this study, the questionnaire meets the aims for this study too.

INTERVIEWER ADMINISTRATION

There are both advantages and disadvantages with interviewer administration of questionnaires. One of the advantages was that none of the questionnaires turned out invalid due to faults from respondents filling out the questionnaire by themselves. One questionnaire was unfinished but this was due to the fact that the respondent had lost the MC prior to trying it for the first time and was thus excluded from the study. On the other hand, there was a tendency of inconsistency from one RA to another meaning that interpretations of questions differed, which led to some inapplicable responses in the analysis, as explained earlier.

The interviewer administration is advantageous if conducted right because it helps the respondents to answer consistent and according to the purpose of the survey. In the MCIFUS, exclusion of data was done and inconsistency from the different RAs detected. This might be due to differing interpretations of the questions and a lack of training. Acknowledging this led to a second round of data collection to ensure high quality of data. Using the same RAs in both research sites would have increased the quality of the survey data collection but due to language differences in the two sites, this was not a possibility.

4.3.4.4 SAMPLE TECHNIQUE AND SIZE

The respondents in the study survey were sampled from participants from the previous MCIS and MCI. Having distributed MCs in various settings in Uganda provides WoMena with the opportunity to follow these recipients over time. Initially, the participating schools where chosen by DCA, TPO, and URCS, all partners of WoMena. This resembles convenience sampling where participants are sampled from known, easily accessible populations (Bowling 2010).

Convenience sampling is a non-random sampling technique, which makes it impossible to estimate if the sample is representative for the study population in rural northern and eastern Uganda. Estimation on representativeness of a study population can be done from random sampling methods, which allow each unit in

a population a calculable probability to be selected to take part in the survey. Thus, researchers can estimate whether this study participants are proportionally represented according to their distribution in the overall population (Bowling 2010). Since the sampling technique in the study does not meet the requirements of randomness, it cannot be assessed whether the sample is representative or not. The interviews showed that some previous MCIS participants might not have wanted to participate because they saw no benefit in participating in the MCIFUS and may have had negative experiences with using the MC. Thus, the respondents in the survey might be girls with a positive attitude towards WoMena and the MC leading to selection bias and a *'false positive'* response when it comes to the perception of the MC.

The sample size was smaller than anticipated. Mainly Gulu left a large number of possible respondents as lost to follow-up. This was largely explained by the difficulty in mobilising the girls, especially those who no longer lived in the communities close to the schools due to marriage or being at boarding school. Another reason for this considerable loss to follow-up in Gulu, compared to Katakwi, could be explained due to the fact that neither WoMena nor any other partner had been present in Gulu for more than two years, while in Katakwi, DCA and TPO were and remain present in the communities. This could possibly explain the difference in acceptance of the MC. Overall, the external validity of the survey is limited and the results from the survey cannot directly be transferred to the general population of Uganda or Eastern Africa.

4.3.4.5 QUANTITATIVE ANALYSES

The main analyses done for the survey are descriptive analyses of the data material. Though using the Fisher's exact test for p-values and the fact that logistic regression can be done with samples above n=30, finding significant ORs is difficult when dealing with small samples, as is the case in this thesis (n=100) (Bowling 2010; Kirkwood et al. 2003b). This does not mean that there is no effect, though. It could mean that the effect is too small or, as might be the case in this study, the sample size (power) is too small. However, no sample size calculation/calculation of strength was made for the survey. These issues combined limit the survey reliability.

However interesting it would be to draw the conclusions that the district, educational level, or other characteristics affect the perception or use of the MC, no conclusions like that can be drawn and the findings from the survey might be coincidental.

Additionally, it should be taken into consideration that no measures were taken towards confounding variables. The fact that statistical significance was found for ethnicity and research site and continued use of the MC does not equal a causal relationship since there was not accounted for confounding variables.

4.3.5 DISCUSSION OF QUALITATIVE RESEARCH

This section provides a discussion of the qualitative research. Firstly, the research method is discussed. Secondly, the implications of the conduction of the semi-structured interviews are discussed and finally, the analysis of the qualitative data is discussed.

4.3.5.1 SEMI-STRUCTURED INTERVIEWS

The research method found to be suitable to answer research question 3 was qualitative methods, in particular the semi-structured interview. This was also inflicted by the fact that this method was chosen by WoMena to conduct the MCIFUS.

ADVANTAGES OF SEMI-STRUCURED INTERVIEWS

Semi-structured interviews provide the researcher with in-depth knowledge about social phenomena and the true meaning and perspective of a topic assigned by the informants. It allows the informants to tell their own story with their own words – being subjects rather than objects (Bowling 2010). It also allows following up on interesting and relevant issues that emerge during the interview. Furthermore, the delicate and personal topic of MHM was considered to better be verbalised by the informants when alone with the RA than i.e. in a focus group discussion. Also, the interviews as a method were a precondition for this study, as it was the method chosen in the MCIFUS.

SENSITIVITY OF RESEARCH FIELD

The research field is a rather tabooed issue among adolescent girls in Uganda as it would be in many other settings in the world. SRH and MHM are topics that many girls find difficult to discuss openly. The tendency in several of the interviews were

that the RAs often had to ask the questions more than once and often they were given short answers, which gave the impression that the informants did not feel comfortable talking freely about the issue. The sensitivity of the research field might have limited the information gathered in the qualitative data since the research assistants needed to probe extensively to get information from the informants.

It is often difficult to account for reliability related to replication in qualitative research. The interviews in this study will in all probability be difficult to replicate, as they are a construction of interaction between the interviewers and the informants. Other researchers are likely to find different answers though investigating the same research questions. This is considered to be a precondition for qualitative research and this study is not considered any worse in its ability to be replicated.

4.3.5.2 CONDUCTION OF INTERVIEWS

In relation to conducting interviews, there are several practical factors that need to be considered. The following will present a discussion of these factors.

THE USE OF RESEARCH ASSISTANTS

Using the RAs for conducting the interviews was meant to increase the willingness of the informants to speak freely, as they would be talking to a person of their own origin and one speaking their own language. This was a deliberate decision made by the MCIFUS study coordinator, as the power imbalance between *mzungus* (white people) and the girls could create even bigger response bias. The RAs were all local, Ugandan females already acquainted with the sensitive field of MHM and the MC.

The perception of the interviews when listening to the recordings in local language and reading through the translated transcriptions revealed a somewhat patronising tone by the RAs towards the informants. This might very well be due to the culture in Uganda where young students are meant to be submissive to people older than themselves or having greater social status than them. The experience in Gulu was that young girls knelt before their teachers in offices and to the research team when approaching them. For a few informants it could seem from the recordings and transcripts that the interview was more an examination than a conversation, as the RAs sometimes have to ask the same question

repeatedly but still getting no answer, as discussed above. However, experience from the field visit was, that the tone and language when making conversation in Uganda seem more direct than in Europe, which could affect the researcher's interpretation of the recordings and transcriptions. The same transcriptions might be interpreted differently by Ugandans. Furthermore, the reserved responses could be due to the fact that menstruation is a sensitive topic and that it takes a while before the informants feel comfortable discussing this with a stranger, although female.

Using the RAs as translators might have strengthened the consistency of and overall quality of the interviews, though it is possible that it would have led to a different unequal power balance between the informant and interviewer.

THE SETTING

The interviews were carried out in the open at remote locations most often close to the schools. Some interviews were carried out in the informants' homes. Both settings could have limited the informants' willingness to share openly since there was a risk of other people seeing the interviews take place and thus identifying the informants, which compromised the anonymity of the informants. Interviews were interrupted both by other children trying to eavesdrop and family members asking the informants questions but the interviews were paused until privacy was re-obtained. To ensure further privacy, the researchers could have assigned specific places or rooms for the interviews so that no identification of the informants or interruption of the interviews would have happened. This could prove fairly difficult in a research setting though, as most school buildings lack proper doors and windows. Overall, interviews were conducted in places that were sufficient private to maintain confidentiality and anonymity.

SAMPLING

The sampling method used for the qualitative research was purposive sampling. This type of sampling is a deliberate non-random method to achieve a sample with certain characteristics (Bowling 2010). As the MCIFUS wished to include both girls who continued and discontinued using the MC, purposive sampling was considered an appropriate method for sampling and thus a precondition for this study.

It is important to stress that every effort was made to ensure that the participants understood the voluntary nature of the study, which was in line with the ethical requirements set by UNCST. However, there is a risk that the informants felt pressured to participate either by the research team, the teachers, or their parents because of having received a benefit, such as the MC and feeling obliged to 'give something back' or because the teachers or parents want to come across as a hospitable community. Additionally, there is a risk that the informants only told the research team 'what they wanted to hear', though all of the above cannot be definitively assessed in this study. The only indication was that two informants gave conflicting answers about their continued use of the MC in the survey and the interviews. As mentioned, it could also be that they gave wrong answers in the survey out of fear for negative consequences or did not understand the questions.

This discussion aside, the data material revealed narratives about both advantages and disadvantages from using the MC, which means that the data was useful and provided insight into the girls' perceptions and experiences of the MC.

A total of ten interviews from the MCIFUS were included in this study; five from Gulu and five from Katakwi. Compared to quantitative research, the sample sizes are rather small in qualitative research. However, as the aim of qualitative research is to provide comprehensive insight to social phenomena or experiences, small sample sizes are accepted, though being uncertain of when a sample is sufficiently large enough to meet the scope of the research is a well-known issue. No clear guideline exists as an appropriate cut-off point but it is widely accepted as a 'rule of thumb' that when the same stories, issues, narratives, and topics are provided by the study subjects (informants) reveal no new findings, the sample can be considered sufficient and a proper sample has been reached (Bowling 2010; Kvale & Brinkmann 2009).

4.3.5.3 ANALYSIS OF QUALITATIVE DATA

The analysis of the qualitative data was a QCA (Drisko & Maschi 2016; Schreier 2012b) as described in chapter 2 and 3. The following outlines a discussion of the trustworthiness of the qualitative data analysis.

SELF-REFLECTION

The following outlines a self-reflection described by Drisko and Maschi (2016). This is done to address personal biases or viewpoints and larger social issues that may affect the decisions and analyses made during the study (Drisko & Maschi 2016).

This researcher is a white, Danish, female, nurse, and student researcher with limited experience in the field of research, MHM or low-income settings – let alone Ugandan culture, society or history. It was the first trip to SSA and it was only for three intense weeks. This time included trying to understand and take in the setting and impressions of a LIC, as well as training of RAs and execution of MCIFUS data collection in Gulu. Due to the insurgency in northern Uganda, relating to the horrifying stories of the people also became an issue to relate to.

Additionally, personal values related to gender equality might have caused this researcher to overlook valuable nuances in the community interactions.

Furthermore, being *mzungu* (a common and fairly cordial African nickname for white people) increased the personal awareness of skin color and applied a perception of power due to the, to Ugandans, expected education and wealth. Being approached by impoverished Ugandans who wanted money, advice, assistance, or simply contacts was thus another aspect to relate to during this intense trip. However, the data is considered valuable, as the researcher's theoretical knowledge on research and ethics led to a proper conduct during the Gulu data collection.

CREDIBILITY, DEPENDABILITY, AND TRANSFERABILITY

To gain trustworthiness in qualitative research it is important to apply a high level of *credibility*, *dependability*, and *transferability* during the analysis procedures (Graneheim & Lundman 2004). Credibility deals with the research focus and means to show the confidence with which the data and analysis processes address the research focus (Graneheim & Lundman 2004). One part of credibility is the sampling of informants, which has been discussed previously. Another part is choosing meaning units and categories and ensure that they cover the data included satisfactory. In this study, the initial coding frame was modified and a second round of coding was then conducted, as categories was identified

interpretively during the first round and other categories were combined since they were similar or had the same overall theme. Furthermore, as recommended by Drisko and Maschi a *formative* reliability check was done after coding approximately 30% of the data material (three interviews) and a *summative* reliability check was done after the coding was completed. This was done in both rounds of coding. These reliability checks were done to review the coding frame and make revisions accordingly to ensure a transparent and comprehensive coding frame that covers the data material (Drisko & Maschi 2016). Ideally, the coding frame should be used to code the data material by several researchers independently to ensure credibility. Supervisors, advisors, and a lector in anthropology with ethnographic experience were consulted during the coding process but due to time restraints the data material was not subjected to additional coding by other researchers. This limits the overall credibility of the data analysis, though it is trusted that the coding of the data was comprehensive and covers the main themes of interest to the research question. Additionally, the findings from the coding were subjected to critique and questions from WoMena colleagues and increased the credibility of the findings in the qualitative data material.

Another aspect of trustworthiness is dependability, which seeks to take into account factors of instability and factors of phenomenal or design induced changes during the data analysis process (Graneheim & Lundman 2004). This applies to the interview phase of this study. Using the same interviewers in Gulu and Katakwi, respectively, increase the dependability of the data material collected. Furthermore, the interview recordings and transcriptions show that the interviewers generally improved their interviewing skills during the data collection period, which led to some change in the probing questions and length of the interviews. This is to be expected, though, and despite the discussed factors, the data material is overall considered to be homogenous, as the categories are identified and coded from all interviews.

The final aspect of trustworthiness is the question of transferability. This refers to the extent to which the results can be transferred to other settings or groups (Graneheim & Lundman 2004). Though it is ultimately the readers decision to

decide of the results are transferable (Graneheim & Lundman 2004), the following attempts to outline the transferability of this study. The setting of rural northern and eastern Uganda are two specific geographical areas in Eastern Africa with each their own cultural and religious traditions, as Uganda is a very diverse country. Before anything can be concluded, more studies similar to this should be applied in different low-income settings. However, the findings in the interviews overall show the same fears and feelings of freedom in both research sites, which suggests that there are some core issues that could be applicable on a more general level.

4.3.6 DISCUSSION OF ETHICAL IMPLICATIONS OF THE STUDY

All participants in both the survey and the semi-structured interviews filled out informed consent (see appendix VI) and received comprehensive information related to the aim of the study in advance and repeatedly. As discussed earlier, all measures were taken to ensure proper ethical conduct as required by UNCST. This meant a strict process to obtain informed consent and excluding girls from participation if they did not have consent, even if they wanted to join the study. Hence, it is considered that the study meets the ethical guidelines as required.

4.3.6.1 CONSIDERATIONS OF IMPLEMENTING UNAVAILABLE TECHNOLOGIES

Even though WoMena has distributed MCs in Uganda for more than three years, a national market availability of the MCs is not yet realised. An on-going effort is being made to make it available and affordable to Ugandan women at the time of writing this thesis.

Thus, introducing a new technology into a poor, rural setting in a somewhat isolated manner as done in the MCIS and the MCI poses some disadvantages. For example, the girls can be confronted with difficult situations in relation to their female family members and friends who did not receive the MC, which was also mentioned by the informants in the interviews. If for some reason a girl looses the MC, she has an awareness of a sanitary product that is not available for her to re-adopt. Several girls mentioned this during the data collection in Gulu, where both girls and women approached the research team for replacements of lost MCs or more MCs to distribute to the community. To meet the needs of replacements, WoMena provided new MCs to all the girls, who had lost it by accident and who wished to receive a new. Furthermore, since the local communities in both Katakwi and Gulu have had a high acceptance of the MC, the partners considered

the intervention successful and scaled up the intervention with an additional 400 MCs in Katakwi in 2014. WoMena are planning to do the same in Gulu with an additional 1,000 MCs in the fall of 2016.

4.3.7 LIMITATIONS OF THIS STUDY

This thesis handles several methods and data from a systematic literature search, a survey, and interviews. It could be argued that within the limited frame of the thesis, choosing only one method and analysis would have allowed for a more thorough investigation.

Furthermore, keeping only to SSA limits the study, as there has been conducted MHM studies in Asia and South America too. However, since the data was collected in SSA, limiting the study to SSA seemed logic, as time restraints were also a significant aspect to consider.

Additionally, it would have been interesting to apply a theory on the findings from this study. If time had allowed it, a theory such as The Theory of Gender and Power by R.W. Connell (Gina M. Wingood & Ralph J. DiClemente 2002; Connell 1987) could have added another level of understanding to the results.

4.4 SUGGESTIONS FOR FURTHER RESEARCH

This thesis gives insight to the challenges faced during menstruation by adolescent girls in rural Uganda. Furthermore, it also provides an insight into the challenges of conducting research and data collection on a sensitive topic in a LMIC.
However, time restraints both during the data collection and in the writing of the thesis have limited the exploration of all the relevant issues in the study. The following outlines aspects of interest to be explored in future research.

The field of MHM is not reduced to only a matter of access to sanitary products. There are multiple factors involved in women's MHM and this thesis only focused on a small part of them.
Barriers to overall MHM such as i.e. access to WASH are key features to break down when wanting to improve schoolgirls' MHM. The feature of WASH in relation to the MC is especially interesting to explore further, as it could provide the knowledge needed to achieve especially the SDG 3. It would have been interesting to address these features too, as they were applied in the MCIFUS through both the survey and the interviews, as well as through sanitary facility assessments made in the schools and in private homes. However, looking at this exceeded the limited scope of this thesis.

Additionally, the issues of using the MC was often related to pain and it would have been interesting to elaborate on this to see if the pain experience is intensified by cultural and/or religious beliefs as well as the fact that the girls might expect the insertion and removal of the MC to be painful and thus experiencing it to be just that. Studies in the field of pain research connected to placebo and nocebo treatments[21] show that an expectation of pain increase the experienced pain and vice versa (Petersen et al. 2014; Benedetti 2014). Furthermore, there is a possibility that religion and culture can affect the pain experience, which could be interesting to further investigate. Studies on religion and religious rituals like praying have shown to have a pain relieving effect (Jegindø et al. 2013; Jegindø

[21] Placebo is used in medicine to describe a patient's positive effect of a medical treatment using an inactive drug. Nocebo is a sub-field of placebo research using negative expectations in the patient to increase the negative effect of a medical treatment using an inactive drug or other treatment.

2012) and thus it could be hypothesised that the reverse effect could be possible too. This is led on by findings from studies from HICs, mostly USA, which have not found pain as an issue from MC use, though the women in these settings also report issues with initial insertion and removal (Howard et al. 2011; Cheng et al. 1995; North & Oldham 2011b; Stewart et al. 2010), suggesting that culture and/or religion affects the perception of menstruation and menstrual related issues, such as pain.

Overall, this study does not address the issue of culture and religion and how they affect the respondents and informants' understanding and interpretation of menstrual health related terms. Future studies in the field of MHM, i.e. in-depth anthropological or ethnographic studies, could benefit from exploring these issues to gain further understanding of how menstruation and menstrual management is perceived in and affected by the culture of the research setting. This could improve the strategies and the success rate for future MHM implementation interventions in low-income settings.

4.5 RECOMMENDATIONS

The study revealed numerous challenges within the field of MHM for adolescent girls in rural Uganda. These challenges create barriers for the girls and possibly their future development. This section outlines the recommendations for Uganda's approach to dealing with and overcoming these challenges and barriers in order for the girls to reach gain dignified MHM.

4.5.1 ADDRESSING THE GAPS

Achieving proper and dignified MHM in Uganda calls for action on addressing the gaps that so far exists. Some of these gaps are outlined in the following.

SRH education is an issue that should be in focus by the Ugandan government, as it could improve dignified MHM for adolescent girls. SRH education should include relevant puberty education for all adolescents in primary schools. As mentioned in chapter 1, MHM has been put on the national agenda in Uganda with the MHM Charter in 2015 (Government of Uganda 2015). International as well as national NGOs and private partners have the responsibility to make the government keep its promise and reach the goals set in the charter. Furthermore, addressing the lack of parental knowledge on SRH and MHM has a possibility to increase the empowerment of adolescent girls, as mentioned by Jewitt & Ryley (2014).

Another recommendation is to subsidise taxes on sanitary products, like in Kenya, or making them free of charge. Eliminating the economic burden of buying sanitary products breaks down another barrier towards achieving gender equality. Using sustainable menstrual management methods like the MC or reusable pads could help minimise the expenses facing the government if making sanitary products free for girls and women. Furthermore, it could save the communities the issue of disposing the sanitary waste from i.e. disposable pads.

The previous interventions in Uganda showed, that the teachers that were trained to assist the girls, were often transferred to other schools. To ensure that the girls receiving the MC remain to have trusted guides or 'experts' available consistently,

WoMena has decided to engage the Village Health Teams (VHTs)[22] in the future. Working closely with Village Health Teams (VHTs) on the issue of MHM and SRH education is an opportunity to create the trickle-down effect that is needed to reach the population of rural Uganda, as the VHTs are available in all communities. WoMena is planning on doing just that in the future intervention studies planned. As an example, Gulu will frame a MC scale up intervention in the fall of 2016, where VHTs are going to play a key role.

Additionally, overall male involvement from brothers, fathers, male teachers, and local politicians has the potential to engage male relatives and community members positively and enhance the support provided to girls by these actors. WoMena has also commenced a project relating to male involvement.

Furthermore, WoMena is beginning to combine school and income generating activities, as they, besides teaching SRH and MHM, train girls and women in how to make soap so they have soap to maintain proper hygiene and soap to sell and earn money. Similar projects are done with reusable pads, where girls and women are taught to make their own pads to use and sell. In the long-term, this could be a sustainable intervention in the communities, engaging women in income generating and empowering activities and has the potential to be transferred to similar low-income settings.

4.5.2 FURTHER RESEARCH IS NEEDED

It is important to stress that the recommendations outlined above are based solely on the findings from this thesis. As the areas of MHM in general and the MC especially, are still fairly new research fields the existing knowledge on these areas is limited. Additional research is needed to further investigate the acceptance and usage of the MC in different settings before general consensus about perception and usage can be reached. Further studies similar to the MCIFUS are needed to establish evidence of the long-term sustainability and acceptance of the MC in low-income settings like rural Uganda. A recommendation is to apply different quantitative and qualitative research methods, as they each have their own strengths and limitations.

[22] VHTs are voluntary teams consisting of local and respected community members who are trained in general public health guidance. The VHTs are managed by the District Health Offices, which are decentralised from the overall Ugandan government.

4.6 CONCLUSION

This thesis sought to answer questions related to MHM in SSA as well as MHM perception and MC use in rural Uganda. It was based on existing knowledge in the field of MHM alongside the perceptions and experiences of adolescent girls from rural northern and eastern Uganda. The questions were explored through a systematic literature search, a cross-sectional survey, and semi-structured interviews.

The study showed that poor MHM impacts adolescent girls everyday life and mobility as well as leads to risk behaviors, such as transactional sex. SRH education, menstrual management methods, and proper sanitary facilities are key factors to increase the access to proper and dignified MHM for girls and women.
The study also showed that the MC acceptance among the adolescent girls using it in rural Uganda was high, though affected by community perception, menstrual myths, and a 'menstrual etiquette' among girls and women. Furthermore, the study showed that use of the MC remains high more than two years after receiving it, and the MC is experienced as a helpful and empowering menstrual management method that frees the girls, gives them a higher level of mobility, stops them worrying about their menstrual status, and keeps them in school – keeps them developing.

Even though this study has certain limitations, it is considered to add useful insight to the complex issue of MHM in LMICs and it adds to the limited existing knowledge of use, perception, and experience of the MC and the gaps in MHM for adolescent girls.

The MHM challenges faced by millions of girls and women in LMICs should be addressed further in the future. As this study showed, the challenges in Uganda are similar to other countries in SSA, which adds to the fact that MHM continues to be an overlooked problem in global public health. There are great possibilities to evolve existing knowledge and create sustainable interventions to ensure that girls and women in LMICs have access to proper and dignified MHM before 2030.

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Photo: ©Tom Saater. Taken in 2014 in Gulu. Kindly licensed by WoMena.

APPENDIX

APPENDIX I: THE COUNTRY OF UGANDA

The Republic of Uganda is a country that has suffered from poor governance and internal conflicts for decades, and is still fighting poverty and inequality. Uganda is also enriched by natural resources and has experienced economic growth within recent years (FN-Forbundet 2015).

POLITICAL BACKGROUND

Uganda consists of 111 districts and the capital city of Kampala. Uganda was a British colony from 1890-1962, where the country gained independence, though it remains a part of the Commonwealth of Nations (FN-Forbundet 2015). From 1971-1979 the country was subjected to the military dictatorship of Idi Amin, which led to conflicts both within the country borders and with neighbouring state Tanzania (FN-Forbundet 2015; Central Intelligence Agency (CIA) 2016). In 1986, present president Yoweri Museveni executed a military coup. He was re-elected for presidency in February 2016 (CNN n.d.), though he has repeatedly been accused of corruption and electoral fraud by his political opposition (FN-Forbundet 2015).

GEOGRAPHY[23]

Uganda is situated on the equator in Eastern Africa. Uganda borders Kenya to the east, the Demographic Republic of the Congo to the west, South Sudan to the North, and Tanzania and Rwanda to the south. Part of the southern border is in the Lake Victoria (Central Intelligence Agency (CIA) 2016). Three fourths of Uganda's land area consists of the Central African

FIGURE I.I: MAP OF UGANDA

[23] For reference of the map of Uganda please see reference: (Word Travel n.d.).

tableland and most of the country is around 900 meters above sea level (FN-Forbundet 2015). Great areas are covered by savannah. The climate is primarily tropical and temperature is steady at around 22 degrees Celsius (FN-Forbundet 2015). Uganda experiences two seasons, rainy season and dry season. Each season occurs twice a year. Uganda also entails national parks and a large animal wild life, including gorillas.

HISTORY, CULTURE, AND RELIGION

Uganda is a diverse country with a great variety of ethnic groups. In Katakwi, Iteso is the main ethnic group, which is estimated to be 6.4% of the population. In Gulu, Acholi is the main ethnicity, estimated to 4.7% of the population (Central Intelligence Agency (CIA) 2016). Both Acholi and Iteso ethnicities are rich tribal cultures. Uganda is a religious country and most confess to Catholicism (41.9%) and Protestantism (42%). 12.1% confess to Islam (Central Intelligence Agency (CIA) 2016).

WAR AND CONFLICT

For more than 20 years, the northern region of Uganda[24] dealt with the terrors of the Lords Resistance Army (LRA). Led by Joseph Kony, LRA abducted children, abused women and children, and caused hundreds of thousands to be internally displaced in big camps or fleeing to neighbouring countries (FN-Forbundet 2015). In the late 2000's, the LRA was forced out of Uganda, and Uganda has since then, with help from international organisations, worked hard to resettle the displaced population (FN-Forbundet 2015; Central Intelligence Agency (CIA) 2016). Eastern Uganda also suffered from an insurgency period from 1986-1993, called the Teso Insurgency[25] (Jones 2007). Cattle raids by the ethnic group of Karamojong combined with rebellious civil war-like fighting, due to the raids, forced the population of the Teso region to be internally displaced in camps similar to the camps in northern Uganda due to the LRA insurgency. In 1993, a settlement brought peace to the region but it remains marked by the insurgency that impacted the economy of the already impoverished region (Jones 2007). Additionally, from 1998-2003, Uganda was involved in 'The African World War' with The Democratic Republic of the Congo (DR Congo) that initially started as a

[24] More specifically, the districts of Kitgum, Gulu, and Pader (ReliefWeb 2007).
[25] Teso is a sub-region in Uganda inhabited by the Iteso ethnic group. It consists of the districts of Katakwi, Soroti, Amuria, Kaberamaido, Kumi, Bukedea, Budaka, and Pallisa (UN OCHA 2009).

civil war in the DR Congo. Although the UN Security Council placed peace-keeping troops into the DR Congo in 2005, conflicts on the border between DR Congo and Uganda remain (FN-Forbundet 2015).

ECONOMY

The Ugandan currency is Ugandan Shillings (FN-Forbundet 2015). The GDP per capita in 2015 was estimated to be $2,000 and Ugandan national budgets remain to rely on donor support (Central Intelligence Agency (CIA) 2016). Approximately 70% of Uganda's population are farmers and the majority of the agricultural production is for autarkic purposes (FN-Forbundet 2015). Agriculture employs one third of the workforce, which is about 18.5 million people (Central Intelligence Agency (CIA) 2016). The main export is coffee (FN-Forbundet 2015; Central Intelligence Agency (CIA) 2016). Previous conflicts, like the one with LRA, have been expensive for Uganda and current conflict in South Sudan also restrains the Ugandan economy (Central Intelligence Agency (CIA) 2016; FN-Forbundet 2015). Hopefully, substantial natural resources like oil, gold, and fertile soils are going to help Uganda to access loans and to become less dependent on aid (FN-Forbundet 2015).

POPULATION

In 2015, the estimated population size of Uganda was of 37.1 million people. 18.6 million of these were girls and women (Central Intelligence Agency (CIA) 2016). Life expectancy is less than 55 years, maternal mortality rate is 343/100,000 live births, and infant mortality rate is 59.21/1,000 live births (Central Intelligence Agency (CIA) 2016). Uganda's greatest health threat remains HIV/AIDS that costs almost 33,000 lives each year (Central Intelligence Agency (CIA) 2016). The population is fairly young especially due to HIV/AIDS. The official language of Uganda is English, which is taught in grade schools, used in courts of law, and in most of the media. Besides English, many local languages are spoken, i.e. Niger-Congo languages, Swahili, and Arabic (Central Intelligence Agency (CIA) 2016).

APPENDIX II: SURVEY QUESTIONNAIRE

QUESTIONNAIRE

WoMena and MUST are conducting a follow up research study to assess the long-term experiences of girls and women using menstrual cups among participants of three previous WoMena supported menstrual cup interventions carried out in Kitgum (2012), Gulu (2013) and Katakwi (2014).

This questionnaire is to be filled in by all participants who have been provided with a menstrual cup as part of the previous studies to understand their experiences using a menstrual cup. We would like to get your sincere opinions and experiences. There are no right or wrong answers - so you should not fear to give us your honest answers [*interviewer can also remind the informant of this during the interview*]. All names and answers will be kept strictly confidential, i.e. they will only be known to the researchers and will not appear in the media or be known by your fellow students, teachers or parents. Thank you very much in advance for your answers.

Date of questionnaire assessment	__ __ - __ __ - __ __ __ __ *(dd-mm-yyyy)*
Data collection site	
Participant ID	
Follow up to	[ ] Kitgum [ ] Gulu [ ] Katakwi
Interviewer's Name	

1. What is your date of birth? __ __ - __ __ - __ __ __ __ *(dd-mm-yyyy)*

1a. *[If birth date is unknown]***What is your age?** _____ years

2. Have you ever attended school?

1. Yes GO TO QUESTION 2a
2. No GO TO QUESTION 3

2a. If yes, what is your level of education?

1. Not finished primary
2. Finished primary
3. Not finished secondary
4. Finished secondary
5. Don't know

3. What is your current status of employment?

1. Currently employed GO TO QUESTION 3a
2. Not currently employed GO TO QUESTION 4
3. Not employed in the last 12 months GO TO QUESTION 4
4. Don't know GO TO QUESTION 4

3a. If yes, - What type of employment are you engaged in? *(Multiple answers allowed)*

1. Agricultural

2. Non-agricultural
3. Don't know

3b. Who are you employed by? *(Multiple answers allowed)*

1. Employed by a family member
2. Employed by a non-family member
3. Self-employed
4. Don't know

4. What is your current marital status?

1. Never married/never lived together
2. Married or living together
3. Divorced/separated/widowed

5. Do you have any children?

1. Yes GO TO QUESTION 5a
2. No GO TO QUESTION 6

5a. If yes, how many? _____ *(enter in figures)*

6. How many rooms are there in your household?_____ *(enter in figures)*

7. How many people are there in your household?_____ *(enter in figures)*

8. Who do you currently live together with? *(Multiple answers allowed)*

1. My mom
2. My dad
3. My grandparent(s)
4. Sister(s)/brother(s)
5. Aunt/Uncle/other relatives
6. Husband/partner
7. Others (specify):
   ……..

9. What is your religion?

1. Catholic
2. Anglican/Protestant
3. Pentecostal
4. Muslim
5. Other (specify):
   ……..
6. Prefer not to say

10. What ethnic group do you belong to?

7. Acholi
8. Iteso
9. Others (specify):
   ……..

EXPERIENCES WITH USE AND NON-USE OF THE MENSTRUAL CUP

The next few questions are about your experiences with using the menstrual cup

11. Did you receive a menstrual cup as part of a previous study?

1. Yes GO TO QUESTION 12
2. No FINNISH QUESTIONNAIRE

12. When did you receive your menstrual cup? _____ *(enter figures only)*

13. Do you still have your menstrual cup?

1. Yes - GO TO QUESTION 13a
2. No - GO TO QUESTION 13B

13a. Did you use a mensturaul cup during you last period?

1. **Yes** GO TO QUESTION 14
2. **No** GO TO QUESTION 13b

13b. If NO, Why not?

1. Gave it away
2. Threw it away on purpose
3. Lost it -explain how :
   ……
   ……
   ……
4. It got damaged -explain how :
   ……
   ……
   ……
5. Other (specify):
   ……
6. Cannot remember

14 .Did you ever try to use the menstrual cup?

4. Yes, I have tried using the cup several times GO TO QUESTION 14a
5. Yes, I tried using the cup, but did not continue using it GO TO QUESTION 14a
6. No, I never tried to use it GO TO QUESTION 14b
4. Other (specify):……

14a. If YES - Are you still using your cup?

3. Yes - GOT O QUESTION **15**
4. No - GO TO QUESTION **14b**

14b. If NO - Why not? *(Multiple answers allowed)*

13. I did not like using it
14. The cup leaked
15. The cup was difficult to clean
16. The cup smelled
17. It was difficult to find a private place to empty the cup¨
18. It was difficult to insert
19. It was difficult to take out
20. My family/friends did not like it
21. I had problems with infections
22. I experienced pain when using the cup
23. I misplaced it and could not get a new one - explain why
    ……
    ……
24. Other (specify): ……

15. What method of menstrual hygiene management do you use instead of the MC? *(allow multiple answers)*

1. Cotton cloth (made from old rags)
2. Cotton gauze (bought in shop)
3. Disposable pads (bought in shop e.g. Always)
4. I use extra pair(s) of knickers/panties

5. I do not use any product
6. Other (specify):
……

CLEANING AND SANITATION - For participants who have continued to use the menstrual cup or used the menstrual cup on the past

The next few questions are about how you use/used your menstrual cup. Again, please be as honest as possible!

16. On average how many times a day do/did you empty your menstrual cup during your menstrual period? _____ times/day *(enter figures only)*

17. During your period, do/did you wash your hands with water and soap before emptying your cup?

1. Yes, always
2. Most of the time (almost every time)
3. Every once in a while (half of the times that I empty my cup)
4. Rarely
5. No, never
6. Cannot remember

18. During your period, do/did you rinse the cup with water before reinserting the cup?

1. Yes, always - GO TO QUESTION **19**
2. Most of the time (almost every day) GO TO QUESTION 18a
3. Every once in a while (half of the days of my period) GO TO QUESTION 18a
4. Rarely GO TO QUESTION 18a
5. No, never GO TO QUESTION 18a
6. Cannot remember GO TO QUESTION 18a

18a. If you do/did not always rinse the cup with water, do you rinse it in any other way?

1. Yes, I wipe the cup with paper
2. Yes, other method, explain:
……
……
3. No, I usually reinsert the cup without rinsing it
4. Do not remember

19. How do/did you store the menstrual cup when you are not using it? *[Multiple responses are allowed]*

1. In the menstrual cup bag
2. In the menstrual cup cardboard box
3. In a hard container/in a tin
4. In a suitcase
5. Together with my clothes (in suitcase, drawer or closet)
6. Other (specify):.....
7. Do not remember

20. Do/did you boil your menstrual cup in water between your menstrual periods?

1. Yes, I boil it between *every* period using the cup GO TO QUESTION 20a
2. Yes, I boil it between *most* periods using the cup GO TO QUESTION 20a
3. Yes, I boil it sometimes GO TO QUESTION 20a
4. No, I never boil it - GO TO QUESTION **20b**.
5. Cannot remember GO TO QUESTION 20a

20a. When do/did you usually boil the cup? [Multiple responses are allowed]

1. I usually boil it immediately *after* my period
2. I usually boil it immediately *before* my period
3. Cannot remember

20b. If you <u>do/did not boil</u> the cup between every period, do/did you clean your cup in any other way? *[Multiple responses are allowed]*

1. Washed it with cold water only
2. Washed it with cold water and soap
3. Poured boiling water over the menstrual cup
4. Used sterilisation tablets
5. Did not clean it after my period
6. Other (specify): ……..
7. Cannot remember

21. Have you experienced any physical discomfort or symptoms when using the MC? If yes – explain which

1. No, never
2. Yes, I experienced pain when urinating/peeing
3. Yes, I experienced vaginal itch
4. Yes, I experienced sore/painful skin in the vaginal area, (explain): ……
5. Yes, a doctor/nurse diagnosed me with a reproductive/urinary tract infection (explain):……
6. Yes, I experienced other abdominal or vaginal discomfort or problems (explain): ……
7. Yes, I experienced other discomfort or problems (not abdominal or vaginal) (explain): ……

OVERALL PERCEPTION OF USING THE MENSTRUAL CUP

22. What do you <u>like</u> about using the menstrual cup? *[Multiple responses are allowed]*

1. I have saved money (as I don't have to buy or buy less products/soap)
2. It helps me to avoid leaking during heavy flow
3. It is comfortable to wear
4. It does not irritate my skin as with other products/methods
5. I can reuse it
6. I can do more things (e.g. go to school/work)
7. Do not know
8. Other (specify): ……

23. What do you <u>not like</u> about using the menstrual cup?*[Multiple responses are allowed]*

1. The cup is difficult to insert/take out
2. The cup was uncomfortable to wear
3. The cup was leaking
4. The cup was difficult to clean
5. The cup smelled
6. It was difficult to find a private place to empty the cup
7. It was difficult to find hand washing facilities before emptying the cup (water and soap)
8. My family/friends did not like it
9. Other (specify):……
10. Nothing - I only liked using the cup

24. In general, how do you feel using the menstrual cup?

I feel very happy

I feel happy

I feel neither happy nor unhappy

I feel unhappy

I feel very unhappy

25. Would you recommend using the cup to a friend?

1. Yes
2. No

Do you have anything you would like to add or to ask?

Question (s)

……

Thank you very much for your time

Questionnaire result:

1. Completed
2. Participant refused to participate
3. Participant could not be located after various attempts
4. Not filled out due to other reason……
……

APPENDIX III: INTERVIEW GUIDE

Semi-structured interview guide – ENGLISH

WoMena and MUST are conducting a follow up research study to assess the long-term experiences of girls and women using menstrual cups among participants of three previous WoMena supported menstrual cup interventions carried out in Kitgum (2012), Gulu (2013) and Katakwi (2014).
The purpose of the this semi-structured interviews is to explore long-term experiences related to use of a menstrual cup incl. challenges and needs, hygienic issues, personal and social practices, norms, attitudes and beliefs.

Presentation of interviewer:
You are participating in Menstrual Cup intervention follow-up study. Its purpose is to explore long-term experiences of using the menstrual cup by girls and women and impact of its use to their and others' lives. With your permission I would like to follow-up on your opinion about Menstrual Hygiene Management, especially the menstrual cup. Your answers will be kept strictly confidential, and your name will only be known to our small group of researchers and will not appear anywhere. We would like to get your sincere opinions and experiences, so please do not fear to give us your honest answers. There are no right or wrong answers - only your personal answers *[interviewer can also remind the informant of this during the interview]*.
With your consent I request we continue with the interview? I would like to know if it is okay that I record what we talk about? In this way I don't have to write down all your answers. Before we begin, I would like to thank you for taking time to participate in this interview.

Themes	Questions
General questions	**Could you please tell us in general a little bit about how you have found using the cup since the cup was given to you?** Do you still have the cup? If not, why? (Probe to see what happened (lost, melted while boiling, some took it, sold…) • If lost: have you tried to receive a new one? Have you ever tried using the cup? If yes, for how long have you been using it? Could you describe your experience of using it during these years/months? How often were you using it? Did you use it during your last period? If no, why not? And when did you use it the last time according to your memory? (if not using it) Why did you stop to use it then? Have you faced any (other) challenges in continue using it? Probe: practical usage, sanitary facilities etc.
Preference & acceptability	We have already asked about your experience in using the menstrual cup and now we would like to ask more specific questions about it: • How do/did you find using the cup in general? • Could you remember your first impression when you started using the cup? Could you it compare your first impression about it with your impression now? • Could you compare your experience before using the cup and now? (FOR

	CONTINUOUS MC USERS) • What did you like about the cup? (why)? • What did you not like about the cup? (why)? • Do you experience any difficulties to insert / take out it? • Do you use other menstrual products together with the menstrual cup during your periods? If yes, could you explain how and when you combine them? (FOR CONTINUOS MC USERS) • How long did it take for you to start feeling comfortable with it? How do you think what influences the feeling of comfort with the menstrual cup?
Hygiene & health	Could you explain how you used the cup? [Could you describe how you usually use the cup during your period?] Probe for: • What did you first do? • How did you insert it? • How did you take it out? • How do you empty it? (IF NOT ANSWERED: Where do you empty it?) How important is the place (school or home) for you to empty your cup? Do you have any preferences? • Did you clean your hands before using the cup? (If yes, how?; If no, why) • How often you change the cup? Have you ever tried to explain it to others? In which situation? *Sanitary facilities*: • Do you have access to the toilet at home/school/work? • How clean is it? • Do you change your cup at home or also at school/work? Do you face any challenges doing it? Is it important for you to know about the sanitary facilities/toilet conditions before deciding to use the cup? (FOLLOW UP ON THE QUESTION) How did you clean the menstrual cup? (IF NOT COVERED IN THE PREVIOUS PART) • How did you clean it during your period? • How did you clean it in between your periods? • Did you boil it (if yes, how, when, how often)? • Did you use tablets for sterilizing it? • Did you have any challenges cleaning the menstrual cup? How do you take care of your cup in between your periods? (How did you keep the menstrual cup when you were not using it?) How about cleaning? Sterilizing it? Are you the only one in your family who received the MC? How did your family members react to it? Has anyone asked you whether they can share/use your cup (if yes, what did you answer)? Did you share your cup with other girls/women? Do you think you ever had any health problems because of using the menstrual cup? Probe for: symptoms and discomfort from the urinary/reproductive tract
Empowerment	• How do you interact with others when you are in your period? (FOR THE CONTINUED USERS: How do you interact with others when you use the menstrual cup? • Are some things more difficult to do? (if yes, which and why?) Could you compare your daily routines and habits (including the days you go to school or work) during your period before and after you started using the MC? Are there any

	differences you noticed? (if yes, how and why?) Which MHM product do you use when you need to travel longer distances during your period? (Do you use the menstrual cup when you have to travel longer distances during your period?) How do you feel participating in different activities and social interactions during your period using the menstrual cup? Could you compare this experience when you use the menstrual cup, and when you use another menstrual product?
Impacts on family and community	Do you know many girls/women who are using the cup? Do you talk about it? How important is for you to use the same menstrual product as other girls? Do you think all of you use the same MHM products? Do people in your circle (family, teachers, peers, co-workers) know (are they aware) about existence of the menstrual cup? Do any of your friends or family members know that you are using the menstrual cup, and if so, what do they think about it? Have they ever asked you anything about it? (If yes, what do they ask?) Have you heard any opinions about you using the menstrual cup? How have you heard them? What do you think about it? Do you talk about the menstruation related issues in your family, with peers etc.? How do you feel talking on these topics? Do you discuss the usage of cup and related issues with your peers, family, teachers, senior women teachers who were training you, etc.? What do you discuss about? Did you hear someone discussing it? How important for you is to have ability to share your experience about the menstrual cup with others? Have you ever asked for help/money from you family members to buy sanitary products? If yes, how did they react? (Do you need to ask for money now????) How about now when you have the cup? (FOR THE CONTINUOUS USERS)
Closing questions	Do you feel or safe in continuing using the cup? Do you feel having sufficient information and experience for continuing to use the MC? Do you need more information about this method? Considering your knowledge and experience about the MC, would you recommend the cup to others? What would you tell them about the cup?
Thank you	Do you have anything you would like to add or to ask? Thank you very much for your time

APPENDIX IV: SEARCH HISTORY

This appendix outlines the search history for the systematic literature review (chapter 2). Each search engine was searched based on the PICO-scheme (table 2.1). Search groups 1-3 (table 2.2) were combined with one of search groups 4-7 (table 2.3). All relevant articles identified are outlined in the tables I-V. Table VI is the included articles in the literature review.

TABLE 2.1: PICO-SCHEME

Population	Intervention	Control	Outcome
Schoolgirls Low- and middle-income countries (Sub-Saharan Africa) Sub-Saharan Africa 10-25 years old	Menstrual cup Menstrual management	Alternative menstrual hygiene product Nothing	Freedom Empowerment School attendance Improved hygiene Acceptability Improved menstrual health

TABLE 2.2: SEARCH GROUPS AND TERMS (INCLUDED IN ALL SEARCHES)

Group 1	Group 2	Group 3
Menstruation Menstr* Period Menstrual cycle	Menstrual cup Menstrual hygiene product Menstrual management Menstrual hygiene Feminine hygiene product	Menstrual health Reproductive health

TABLE 2.3: SEARCH GROUPS AND TERMS (ONLY ONE GROUP INCLUDED IN EACH SEARCH)

Group 4	Group 5	Group 6	Group 7
Freedom Emancipation Independence Liberty	Attendance Attend Presence Appearance Showing	Integrate Take Accept Acceptability Adopt Embrace Welcome	Empower Empowerment Enable

SEARCH HISTORY PUBMED (table I)

Search words	Hits	Comments/selected articles
Search group 1	1,189,843	*Too wide → search terms to be added*
Search group 2	5,941	*Too wide → search terms to be added*
Search group 3	75,288	*Too wide → search terms to be added*
Search group 4	87,282	*Too wide → search terms to be added*
Search group 5	1,746,831	*Too wide → search terms to be added*
Search group 6	273,285	*Too wide → search terms to be added*
Search group 7	130,764	*Too wide → search terms to be added*
Search group 1-7	0	*Too narrow → remove search terms*
Search group 1-3	1,928	*Too wide → search to be specified*
Search group 1-4	12	*None relevant*
Search group 1-3+5-7	14	*1 article relevant.*
Search group 1-3+5	119	*4 articles relevant. 1 duplicate.*
Search group 1-3+7	29	*6 articles relevant. 2 duplicates.*
Search group 1-3+6	182	*3 articles relevant. 1 duplicate.*

SEARCH HISTORY SCOPUS (table II)

Search words	Hits	Comments/selected articles
Search group 1	481,095	*Too wide → search terms to be added*
Search group 2	880	*Too wide → search terms to be added*
Search group 3	10,467	*Too wide → search terms to be added*
Search group 4	876,955	*Too wide → search terms to be added*
Search group 5	5,297,282	*Too wide → search terms to be added*
Search group 6	1,856,962	*Too wide → search terms to be added*
Search group 7	536,961	*Too wide → search terms to be added*
Search group 1-7	0	*Too narrow → remove search terms*
Search group 1-4	25	*None relevant*
Search group 1-3+5	160	*6 articles relevant.*
Search group 1-3+6	87	*6 articles relevant. 3 duplicates.*
Search group 1-3+7	29	*7 articles relevant. 1 duplicate*

SEARCH HISTORY POPLINE (table IV.III)

Search words	Hits	Comments/selected articles
Search group 1	52,862	*Too wide → search terms to be added*
Search group 2	538	*Search terms to be added*
Search group 3	55,316	*Too wide → search terms to be added*
Search group 4	5,106	*Too wide → search terms to be added*
Search group 5	18,944	*Too wide → search terms to be added*
Search group 6	26,153	*Too wide → search terms to be added*
Search group 7	7,810	*Too wide → search terms to be added*
Search group 1-4	2	*None relevant.*
Search group 1-3+5	37	*1 article relevant.*
Search group 1-3+6	49	*3 articles relevant. 1 duplicate.*
Search group 1-3+7	10	*2 articles relevant. 1 duplicate.*

SEARCH HISTORY COCHRANE

Search words	Hits	Comments/ selected articles
Search group 1	132,069	*Too wide → search terms to be added*
Search group 2	310	*Search terms to be added*
Search group 3	1,099	*Too wide → search terms to be added*
Search group 4	3,638	*Too wide → search terms to be added*
Search group 5	212,036	*Too wide → search terms to be added*
Search group 6	75,778	*Too wide → search terms to be added*
Search group 7	6,026	*Too wide → search terms to be added*
Search group 1-4	1	*None relevant*
Search group 1-3+5	22	*None relevant*
Search group 1-3+6	0	
Search group 1-3+7	0	

SEARCH HISTORY PSYCHINFO (table IV)

Search words	Hits	Comments/selected articles
Search group 1	182,397	*Too wide → search terms to be added*
Search group 2	319	*Search terms to be added*
Search group 3	20,633	*Too wide → search terms to be added*
Search group 4	51,031	*Too wide → search terms to be added*
Search group 5	212,149	*Too wide → search terms to be added*
Search group 6	194,283	*Too wide → search terms to be added*
Search group 7	41,594	*Too wide → search terms to be added*
Search group 1-4	2	*None relevant*
Search group 1-3+5	8	*1 article relevant.*
Search group 1-3+6	6	*1 article relevant. 1 duplicate.*
Search group 1-3+7	3	*1 article relevant.*

SEARCH HISTORY WEB OF SCIENCE (table V)

Search words	Hits	Comments/selected articles
Search group 1	1,593,987	*Too wide → search terms to be added*
Search group 2	2,164	*Too wide → search terms to be added*
Search group 3	37,770	*Too wide → search terms to be added*
Search group 4	239,150	*Too wide → search terms to be added*
Search group 5	9,779,518	*Too wide → search terms to be added*
Search group 6	2,989,398	*Too wide → search terms to be added*
Search group 7	688,190	*Too wide → search terms to be added*
Search group 1-4	3	*None relevant*
Search group 1-3+5	78	*6 articles relevant.*
Search group 1-3+6	80	*2 articles relevant. 1 duplicate.*
Search group 1-3+7	9	*3 articles relevant. 1 duplicate.*

TABLE I: ARTICLES INCLUDED FROM: PubMed

Author(s)	Year	Title	Journal (abbreviated)
Allen et al.	2010	Intravaginal and menstrual practices among women working in food and recreational facilities in Mwanza, Tanzania: implications for microbicide trials.	AIDS and Behavior
Beksinska et al.	2015	Acceptability and performance of the menstrual cup in South Africa: a randomized crossover trial comparing the menstrual cup to tampons or sanitary pads.	J Women's Health
Boosey et al.	2014	Menstrual hygiene management amongst schoolgirls in the Rukungiri district of Uganda and the impact on their education: a cross-sectional study.	Pan Afr Med J
Gultie et al.	2014	Age of menarche and knowledge about menstrual hygiene management among adolescent school girls in Amhara province, Ethiopia: implication to health care workers & school teachers.	PLoS ONE
McMahon et al.	2011	The girl with her period is the one to hang her head' Reflections on menstrual management among schoolgirls in rural Kenya.	BMC Int Health Hum Rights
Montgomery et al.	2012	Sanitary pad interventions for girls' education in Ghana: a pilot study.	PLoS ONE
Muhwezi et al.	2015	Perceptions and experiences of adolescents, parents and school administrators regarding adolescent-parent communication on sexual and reproductive health issues in urban and rural Uganda.	Reprod Health
Rusakaniko et al.	1997	Trends in reproductive health knowledge following a health education intervention among adolescents in Zimbabwe.	Cent Afr J Med
Sumpter & Torondel	2013	A systematic review of the health and social effects of menstrual hygiene management.	PLoS ONE
Tegegne & Sisay	2014	Menstrual hygiene management and school absenteeism among female adolescent students in Northeast Ethiopia.	BMC Public Health

TABLE II: ARTICLES INCLUDED FROM: Scopus

Author(s)	Year	Title	Journal (abbreviated)
Joshi et al.	2015	Menstrual hygiene management: Education and empowerment for girls?	Waterlines
Beksinska et al.	2015	Acceptability and performance of the menstrual cup in South Africa: A randomized crossover trial comparing the menstrual cup to tampons or sanitary pads	J Women's Health
Beksinska et al.	2015	Better menstrual management options for adolescents needed in South Africa: What about the menstrual cup?	S Afr Med J
Grant et al.	2013	Menstruation and school absenteeism: Evidence from rural Malawi	Comp Educ Rev
Grose & Grabe	2014	Sociocultural Attitudes Surrounding Menstruation and Alternative Menstrual Products: The Explanatory Role of Self-Objectification	Health Care Women Int
Gultie et al.	2014	Age of menarche and knowledge about menstrual hygiene management among adolescent school girls in amhara province, Ethiopia: Implication to health care workers & school teachers	PLoS ONE
Herrmann & Rockoff	2012	Does menstruation explain gender gaps in work absenteeism?	J Hum Resour
Jain & Singh	2014	Design development and acceptability of feminine hygiene product	Textile Trends
Mason et al.	2014	We Keep It Secret So No One Should Know' - A Qualitative Study to Explore Young Schoolgirls Attitudes and Experiences with Menstruation in Rural Western Kenya	PLoS ONE
McMahon et al.	2011	The girl with her period is the one to hang her head' Reflections on menstrual management among schoolgirls in rural Kenya.	BMC Intl Health Hum Rights
Oster & Thornton	2011	Menstruation, sanitary products, and school attendance: Evidence from a randomized evaluation	Am Econ J Appl Econ
Phillips-Howard et al.	2015	Menstrual Needs and Associations with Sexual and Reproductive Risks in Rural Kenyan Females: A Cross-Sectional Behavioral Survey Linked with HIV Prevalence	J Women's Health
Sommer et al.	2015	A comparison of the menstruation and education experiences of girls in Tanzania, Ghana, Cambodia and Ethiopia	Compare
Sumpter & Torondel	2013	A Systematic Review of the Health and Social Effects of Menstrual Hygiene Management	PLoS ONE
Tegegne & Sisay	2014	Menstrual hygiene management and school absenteeism among female adolescent students in Northeast Ethiopia.	BMC Public Health

TABLE III: ARTICLES INCLUDED FROM: Popline

Author(s)	Year	Title	Journal
Hillard	2002	Menstruation in young girls: a clinical perspective.	Obstet Gynecol
APHRC	2010	Attitudes towards, and acceptability of, menstrual cups as a method for managing menstruation: Experiences of women and schoolgirls in Nairobi, Kenya.	(Policy Brief)
McMahon et al.	2011	The girl with her period is the one to hang her head' Reflections on menstrual management among schoolgirls in rural Kenya.	BMC Intl Health Hum Rights
Sumpter & Torondel	2013	A systematic review of the health and social effects of menstrual hygiene management.	PLoS ONE

TABLE IV: ARTICLES INCLUDED FROM: PsychInfo

Author(s)	Year	Title	Journal
Allen et al.	2010	Intravaginal and menstrual practices among women working in food and recreational facilities in Mwanza, Tanzania: Implications for microbicide trials.	AIDS and Behavior
Beksinska et al.	2015	Acceptability and performance of the menstrual cup in South Africa: A randomized crossover trial comparing the menstrual cup to tampons or sanitary pads.	J Women's Health

TABLE V: ARTICLES INCLUDED FROM: Web of Science

Author(s)	Year	Title	Journal
Gultie et al.	2014	Age of Menarche and Knowledge about Menstrual Hygiene Management among Adolescent School Girls in Amhara Province, Ethiopia: Implication to Health Care Workers & School Teachers	PLoS ONE
Hennegan & Montgomery	2016	Do Menstrual Hygiene Management Interventions Improve Education and Psychosocial Outcomes for Women and Girls in Low and Middle Income Countries? A Systematic Review	PLoS ONE
Mason et al.	2014	We Keep It Secret So No One Should Know' - A Qualitative Study to Explore Young Schoolgirls Attitudes and Experiences with Menstruation in Rural Western Kenya	PLoS ONE
Ndlovu & Bhala	2016	Menstrual hygiene - A salient hazard in rural schools: A case of Masvingo district of Zimbabwe	Jamba
Parker et al.	2014	Menstrual management: a neglected aspect of hygiene interventions	Disaster Prev Manag
Sommer et al.	2016	A Time for Global Action: Addressing Girls' Menstrual Hygiene Management Needs in Schools	Plos Medicine
Sommer et al.	2015	A comparison of the menstruation and education experiences of girls in Tanzania, Ghana, Cambodia and Ethiopia	Compare
Sumpter & Torondel	2013	A Systematic Review of the Health and Social Effects of Menstrual Hygiene Management	PLoS ONE
Upashe et al.	2015	Assessment of knowledge and practice of menstrual hygiene among high school girls in Western Ethiopia	BMC Women's Health

TABLE VI: ARTICLES INCLUDED IN LITERATURE REVIEW

Author(s)	Year	Title	Journal
APHRC	2010	Attitudes towards, and acceptability of, menstrual cups as a method for managing menstruation: Experiences of women and schoolgirls in Nairobi, Kenya.	(Policy Brief)
Beksinska et al.	2015	Acceptability and performance of the menstrual cup in South Africa: a randomized crossover trial comparing the menstrual cup to tampons or sanitary pads.	J Women's Health
Boosey et al.	2014	Menstrual hygiene management amongst schoolgirls in the Rukungiri district of Uganda and the impact on their education: a cross-sectional study.	Pan Afr Med J
Grant et al.	2013	Menstruation and school absenteeism: Evidence from rural Malawi	Comp Educ Rev
Gultie et al.	2014	Age of menarche and knowledge about menstrual hygiene management among adolescent school girls in Amhara province, Ethiopia: implication to health care workers & school teachers.	PLoS ONE
Hennegan & Montgomery	2016	Do Menstrual Hygiene Management Interventions Improve Education and Psychosocial Outcomes for Women and Girls in Low and Middle Income Countries? A Systematic Review	PLoS ONE
Jewitt & Ryley	2014	It's a girl thing: Menstruation, school attendance, spatial mobility and wider gender inequalities in Kenya	Geoforum
Lawan et al.	2014	Menstruation and Menstrual Hygiene amongst Adolescent School Girls in Kano, Northwestern Nigeria	Afr J Reprod Health
Mason et al.	2014	We Keep It Secret So No One Should Know' - A Qualitative Study to Explore Young Schoolgirls Attitudes and Experiences with Menstruation in Rural Western Kenya	PLoS ONE
Mason et al.	2015	Adolescent schoolgirls' experiences of menstrual cups and pads in rural western Kenya: a qualitative study	Waterlines
McMahon et al.	2011	The girl with her period is the one to hang her head' Reflections on menstrual management among schoolgirls in rural Kenya.	BMC Intl Health Hum Rights
Montgomery et al.	2012	Sanitary pad interventions for girls' education in Ghana: a pilot study.	PLoS ONE
Phillips-Howard et al.	2015	Menstrual Needs and Associations with Sexual and Reproductive Risks in Rural Kenyan Females: A Cross-Sectional Behavioral Survey Linked with HIV Prevalence	J Women's Health
Sommer et al.	2015	A comparison of the menstruation and education experiences of girls in Tanzania, Ghana, Cambodia and Ethiopia	Compare
Sumpter & Torondel	2013	A systematic review of the health and social effects of menstrual hygiene management.	PLoS ONE
Tegegne & Sisay	2014	Menstrual hygiene management and school absenteeism among female adolescent students in Northeast Ethiopia.	BMC Public Health
Upashe et al.	2015	Assessment of knowledge and practice of menstrual hygiene among high school girls in Western Ethiopia	BMC Women's Health

APPENDIX V: LETTER OF INTRODUCTION (MCIFUS)

Dear potential study participants,
WoMena, which is a Danish NGO working on implementation of reproductive health solutions, is conducting a research study in collaboration with Mbarara University of Science and Technology (MUST) . The study will focus on three areas (Kitgum, Gulu and Katakwi) where WoMena has previously supported menstrual cup (MC) studies and interventions. The MC is a flexible, bell-shaped cup worn inside the vagina during menstruation to collect menstrual fluid. This study will explore the experiences of participants that received MCs in 2012, 2013 and 2014. Participants from previous studies have received MCs, but we are not sure whether they are using them or not – that is what we wish to explore. We are also interested in hearing what their families, teachers and communities have to say about it.
This information pack will provide you with information on the study so that you can make an informed decision about whether you would like to take part of not. Included in this pack you will find the following:

- **Informed consent form (including parental consent)**
- **List of contact details**

Who will take part in the study?
We would like to speak to a wide range of different people in the community. Three groups of participants have been asked to take part in this study: either because they participated in a previous WoMena study/intervention, are related to one of the previous study participants, or teach or somehow are involved in the life of the girls/women. To the previous study participants, we will ask them to answer some few questions for a survey, then based on that we will select a few girls/women to do longer interviews. We will ask girls/women to identify family members who will be included in group discussions – teachers and community leaders will also be asked to join these discussions.

What will happen if I agree to take part in this study?
Taking part in this study is completely voluntary and you can decide whether or not you want to take part. If you choose to take part, you will be asked to give written consent. In this folder you can find a copy of the written consent form. Please make sure you read it carefully. If you are not able to read the consent form, a witness will be provided who can read the document to you and you can sign the consent using a thumb print. If you change your mind, you can withdraw from the study at any time without giving any reason. Participation will take approximately 20 minutes to an hour and a half and will include answering a short questionnaire and/or taking part in an interview or taking part in a group discussion.

If you don't mind and would be fine with us taking some pictures of you to put on our website, where we would identify you being part of this study, we would really appreciate it – but this is not a requirement to be part of the study. There are also no direct benefits from participating in the study – but the knowledge will help us improve future MC interventions.

Please read through the consent form which will give you more details on the study. If you have any questions about the study, please feel free to contact me or one of the other contacts on the contact list provided in this folder.

Kind regards,
Laura Hytti
Study Coordinator
Tel: +256 (0)775192916 / +447851945020
E-mail: laura@womena.dk

APPENDIX VI: CONSENT FORM

MBARARA UNIVERSITY OF SCIENCE AND TECHNOLOGY
INSTITUTIONAL REVIEW COMMITTEE
P.O. Box 1410, Mbarara, Uganda

Tel: 256-4854-33795 Fax: 256 4854 20782
Email: irc@must.ac.ug **mustirb@gmail.com**
Web site: *www.must.ac.ug*

INFORMED CONSENT DOCUMENT

Study Title: Menstrual cup interventions follow up study - A follow up study of menstrual cup recipients through WoMena-supported projects in Kitgum, Gulu and Katakwi

Principal Investigator(s): Marianne Tellier (WoMena)

INTRODUCTION

What you should know about this study:

- You are being asked to join a research study
- This consent form explains the research study and your part in the study
- Please read it carefully and take as much time as you need
- You are a volunteer. You can choose not to take part and if you join, you may quit at any time. There will be no penalty if you decide to quit the study

WoMena, (a Danish NGO working on implementation of reproductive health solutions, is conducting a research study in collaboration with Mbarara University of Science and Technology (MUST). The study will focus on three areas (Kitgum, Gulu and Katakwi) where WoMena has previously supported MC studies or interventions. As you probably know, an MC is a flexible, bell-shaped cup worn inside the vagina during menstruation to collect menstrual fluid. This study will explore the experiences of participants that received MCs in 2012, 2013 and 2014. Participants from previous studies have received MCs, but we are not sure whether they are using them or not – that is what we wish to explore. We are also interested in hearing what their families, teachers and communities have say about menstrual hygiene management and its impact on the lives of community members.

Purpose of the research project: This study aims to research the long-term experiences of using MCs among girls and women in three study areas (Kitgum, Gulu and Katakwi). Three groups of participants have been asked to take part in this study: either because they participated in a previous WoMena study/intervention, are related to one of the previous study participants, or teach or somehow are involved in the life of the girls/women.

We will ask participants of previous studies (girls and women who have used MCs) to answer a questionnaire to understand whether MCs are still being used by study participants. Interviews and focus group discussions will allow the study team to assess long-term experiences of using MCs, community attitudes and experiences of the introduction of cups and hw well previous interventions have worked.

Approximately 240 participants in total will take part in the study. Between 120 and 220 girls and women will be asked to complete a questionnaire. 15 participants will take part in interviews and

approximately 30 participants will take part in focus group discussions. Participation in this study is expected to last between 20 minutes to an hour and a half.

Why you are being asked to participate: You have been asked to take part in this study as you participated in one of the previous WoMena supported studies or interventions and were given a MC as part of the intervention. You do not need to be currently using the cup to take part in this study.

Procedures: Your participation will last for approximately between 20 minutes and an hour and a half. The study is taking place in Kitgum, Gulu and Katakwi. Girls and women who participated in the previous studies will be asked to complete a 20 minutes questionnaire Then based on that, we will select a few girls to do a longer interview. In the interviews we will ask them to identify family member who will be included in group discussions. In total we will hold 15 interviews and 9 group discussions.
Before you take part in this research, the study will be explained to you and you will be given a chance to ask questions. Your consent will be taken in writing. You will be given a copy of this information sheet to take home with you.
If you agree to take part in this study, the following will happen:

You will be asked to take part in a short questionnaire lasting about 20 minutes during which you will be asked about your experiences using the MC. You do not need to be currently using the MC to take part. Following the questionnaire, you may be asked to attend an interview that will last between 45 minutes and an hour and will be arranged in a place that is convenient for you to attend

Information from the questionnaires will be entered into a data base and analyzed. The interviews and group discussion will be recorded. The recordings will be translated, transcribed and analyzed and the audiotapes will be destroyed. At the end of the project, a report that will written and the results of the study may be published.

Risks / discomforts: No direct risks from this study have been identified. Discussing menstruation and the related norms and practices may however be a sensitive subject. All interviews will thus be conducted in private.

Benefits: There are no direct benefits for you for participating in this study. However, information gained in this study may contribute to future interventions implemented in the area

Incentives / rewards for participating: There is no compensation for taking part in this study.

Protecting data confidentiality: Information collected from this study is confidential. All interviews and focus group discussions will be digitally recorded. Recordings and all files containing confidential information will be stored in password protected files. Any written questionnaires, transcriptions of the interviews and FGDs will be stored in a locked cupboard and all personal details will be removed. Confidential data will only be accessed by the research team, however MUST and the Uganda National Council for Science and Technology (UNCST) may review copies of the study records. Data collected are the property of WoMena. In the event of any publication regarding this study, your identity will not be disclosed

We would also like to take some photos to put on our website. This would identify you as being part of this study. We will ask for your consent to take photos, but it is not a requirement to take part in the study and is completely voluntary.

Protecting subject privacy during data collection: All interviews and FGDs will be held in a location that is convenient for you to attend but also private.

Right to refuse / withdraw: Participation in this study is voluntary and you can decide whether or not you want to take part. If you choose to take part, you will be given a copy of this letter to keep and you will be asked to give written consent. If you are not able to read the consent form, a witness will be provided who can read the document to you and you can sign the consent using a thumb

print. If you change your mind, you can withdraw from the study at any time without giving any reason. If during the interview /discussion group you do not wish to answer any of the questions asked, you do not need to do so.

By giving your consent, you will not waive any of your legal rights or release the parties involved in this study form liability for negligence.
What happens if you leave the study? You may discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled. In case you decide to withdraw from this study, you will be asked to sign a form confirming withdrawal from the study.

Who do I ask/call if I have questions or a problem?

You can contact the WoMena team using the details below:

English: Laura Hytti, Study Coordinator, Tel: Tel: +256 775192916, E-mail: laura@womena.dk
Luo: Akurtoo Prisca, Tel: 0777024639

If you have any questions about your rights as a research subject, you can call the Chairman of the MUST-IRC:
Mbarara University of Science and Technology
Institutional Review Committee
P.O. Box 1410, Mbarara, Uganda
Tel: 256-4854-33795
Fax: 256 4854 20782

Kind regards,

Laura Hytti
Study Coordinator
Tel: +256 (0)775192916 / +447851945020
E-mail: laura@womena.dk
Address: Plot 13/15 Kenneth Dale Drive, Kamwokya, Kampala

Consent form No._____

Consent from participant under the age of 18

What does your signature (or thumbprint/mark) on this consent form mean?
Your signature on this form means

- You have been informed about this study's purpose, procedures, possible benefits and risks
- You have been given the chance to ask questions before you sign
- You have voluntarily agreed to be in this study

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Print name of participant Signature of participant/legally Date

authorized representative

_____	_____	_____
Print name of person obtaining consent	Signature	Date

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Thumbprint/mark	Signature of witness	Date

Parental consent

Parent or caregiver's signature is required for participants who are under the age of 18.

What does your signature (or thumbprint/mark) on this consent form mean?

Your signature on this form means

- You have been informed about this study's purpose, procedures, possible benefits and risks
- You have been given the chance to ask questions before you sign
- You have voluntarily consented to my child/dependent taking part in this study

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Print name of parent or caretaker	Signature of parent of caretaker/legally authorized representative	Date

_____	_____	_____
Print name of person obtaining consent	Signature	Date

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Thumbprint/mark	Signature of witness	Date

Consent to use photographs

If I agree that pictures taken of me during the study can be used in reports, articles and other written material concerning the study, I should sign below:

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Print name of participant	Signature of participant/legally authorized representative	Date

_____	_____	_____
Print name of parent or caretaker	Signature of parent or caretaker/ legally authorized reprsentative	Date

_____	_____	_____
Print name of person obtaining consent	Signature	Date

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Thumbprint/mark	Signature of witness	Date