

**The attitude towards keeping menstruation a secret and its relation to
patriarchal beliefs and menstruation knowledge.
Findings from a survey in secondary schools in Mwanza, Tanzania.**

Selina Rombach

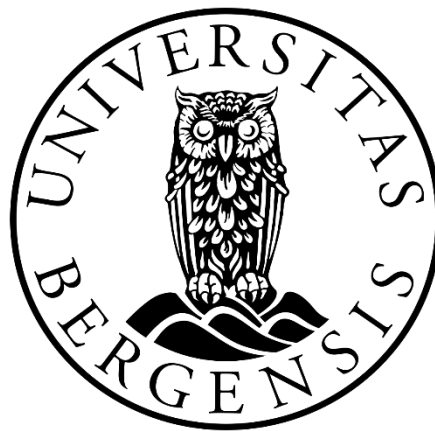
Fall 2023

Specialisation: Gender and quantitative methods

Department of Health Promotion and Development

Faculty of Psychology

University of Bergen



Thesis submitted in partial fulfilment of the requirements for the degree
Master of Philosophy in Global Development Theory and Practice,
with specialisation in gender, University of Bergen, 2023

Acknowledgement

I would like to formally thank Meltzer Foundation for their generous scholarship for this project, as well as the Heinrich Böll Foundation for their support throughout all my studies. Further, I would like to extend my thanks to the Pushing Pads team project, who did not only financially enable me to do this study but also sparked the idea initially. I would like to particularly thank Karine Aasgaard Jansen, who gave me a seat on the table with the most inspiring women through pushing pads, supported me in many other ways and introduced me to CMI. Being part of the ambitious and supportive research environment at CMI was truly inspiring. All the help I got there is a sign of a beautiful culture within the hectic academic world. Thanks to everyone!

I am hugely thankful to my supervisor Helga Bjørnøy Urke. Thanks for your trust to begin with. Thank you for answering my many questions patiently, easing my worries kindly and challenging me to reunite with R and exploring new methodological grounds. Your expertise and encouragement were so valuable for me in all stages of this project. I could not have asked for a better supervisor.

I would like to thank Dr. Richard Sambaiga who helped me realising my fieldwork. Your support and patience were highly appreciated.

To Dr. Elialilia Okello, my gratitude for your support is beyond words. While this fieldtrip has probably been the most challenging undertaking in my life, having had you as my guidance felt like winning a lottery and more. I am still perplexed by your kindness and your investment in me and this project. You are incredible.

To Onike Mcharo, I am so happy to have had you as my partner in crime. It was you who made this fieldwork not only successful but also incredibly fun. Thank you for sharing your bright mind, your relaxed energy, and your friendship with me. I cannot wait for our future missions. You are a powerhouse, Onny!

To the late Dorocella Reuben Vermue, your warm smile and your witty humour made me feel home in Mwanza from the first second. Being in your company in the beautiful garden always grounded me in those exciting times. You were a radiant person, and you leave behind a legacy of pure kindness. You are missed.

Also, many thanks to all my dear and smart friends who read my chapters, rehearsed presentations with me and kept my spirits high. I am feeling lucky.

Finally, I would like to thank all the authorities in Tanzania, namely NIMR, COSTECH, the regional authorities of Mwanza region, Ilemela district and Misungwi district as well as all the principals and teachers for their cooperation.

And of course, my greatest thanks go to all the students who participated in this study. This thesis is naturally dedicated to you. Thank you for welcoming me and giving me your time.

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Abbreviations

SDT = Social Dominance Theory

SDO = Social Dominance Orientation

BATM-S = Beliefs and Attitude Towards Menstruation scale – Secrecy dimension

CFA = Confirmatory factor analysis

SEM = Structural equation model

Abstract

Background: The challenging circumstances of menstruating girls in low-and middle-income countries, among other in Tanzania, has gained relevance on the political agenda, development studies and feminist analysis. A common feature across the arenas concerned with menstruation is the recognition of menstruation as a “silent topic”. Research shows that when girls learn about menstruation it most often focuses on how to keep it secret most effectively. However, the norm of keeping it secret can foster negative feelings and consequences. Research among Tanzanian female students found that anxiousness of blood stains or revealing otherwise that they are menstruation distracts them from studying, and that shame related to menstruation keeps them from asking for support from teachers. While this secrecy around menstruation is recognised for its universality, persistence, and effect on girls’ life by both theory and practice, questions remain. Why do women and girls hide their menstruation, for whom, and are there underlying power structures that play a role?

Objective: This study aimed to investigate the roots of this secrecy norm empirically, using social dominance theory. The objective of this study was the investigation of the attitude towards keeping menstruation a secret and its association with patriarchal beliefs and knowledge about menstruation, among Tanzanian male and female students. Further, examined this study the scales of these three study variables, for their applicability in the study. The detailed assessment of the scales contributes to the field of empirical menstruation studies, which lack measurements of high quality and comparability.

Method: This study used a cross-sectional questionnaire survey in two rural and two urban public schools in Mwanza region, Tanzania (N =490). Participants were between 13 and 19 years old and were both female and male. Scales were assessed using confirmatory factor analysis and reliability analysis while associations were investigated using structural equation modelling.

Results: A small significant positive association between patriarchal beliefs and the attitude of keeping menstruation a secret was found across the full sample including both girls and boys, meaning that stronger support for patriarchal beliefs was associated with stronger attitudes towards menstruation should be kept a secret. The role of knowledge was statistically unclear in the final model due to insufficient fit- All three scales showed context-specific limitations, but confirmatory factor analysis showed overall acceptable fits. Patriarchal beliefs were measured most precisely by an extracted dimension (anti-egalitarianism).

Conclusion: The results of this study advocate to extend aspirations for improving the situation of menstruating schoolgirls in Tanzania, through addressing patriarchal structures. The applicability of the scales in the study context can be generally confirmed with minor adjustments.

Keywords: Menstruation, Tanzania, Stigma, Secrecy Social dominance orientation, Beliefs and attitudes towards menstruation scale, social dominance orientation

I Introduction

1.1 Background

Menstruation is a topic of rising attention. Not only has the scholarly interest on the topic grown in the last decades, but some say that menstruation and menstrual health “is the new darling of girl-centred development” (Bobel, 2019, p. 203). Each day 300 million women are having their period (Hennegan et al., 2019). The focus on menstruation in research and development is well justified as many girls and women find themselves in conditions that are compromising their physiological and psychological well-being and their participation in society while menstruating. Although these circumstances are reported in previous research in many low-and middle-income countries (LMIC) (Chandra-Mouli & Patel, 2020; Coast et al., 2019; Shannon et al., 2021), this study sets its focus on Tanzania. Evidence from Tanzania has shown for example that girls face limited access to products that help to handle the blood flow and manage the pain (Cherenack & Sikkema, 2022). Negative narratives or so-called “myths” about menstruation coexist with a varying level of knowledge about menstruation (Sommer et al., 2015). Tanzanian girls and women face negative reactions from other members of their social surroundings, like expectations to behave in a certain way that includes restrictions or even period teasing by boys in secondary schools (Benshaul-Tolonen et al., 2020). Girls report feeling anxious and stressed during their menstruation in school because they fear leaking and are hesitant to ask teachers for advice or practical help to deal with their menstruation due to shame (Sommer, 2010a). This stress and shame is nurtured by the internalised norm of concealing the period and keeping it secret. This norm is present in Tanzania and beyond (Hennegan et al., 2019; Sommer, 2009, 2010a). The widely shared norm that the period should be concealed is a paradox, since menstruation is a natural, re-occurring event that is a sign of a healthy body. Significant about menstruation is the fact that it is a unique feature of a female body. Therefore, the question arises of where the taboo of menstruation has its social roots from and whether it might be one of the expressions of patriarchal structures in society.

Menstruation is not located within a social vacuum (Bobel, 2019), the norms around it are a product of socialisation and reinforcement (Hennegan et al., 2019). The great effort expected of menstruators to isolate their period from the perception of the public, communicates it is worth hiding because it is disgusting or unhygienic (McHugh, 2020).

Women still lack power in society and face different forms and degrees of discrimination of their bodies and beyond, all over the world (United Nations Development Programme (UNDP), 2023). Attributing the bodies of groups who lack power in society as unhygienic serves the enforcement and maintenance of the power by the privileged group (Bobel, 2019; Erchull, 2020; Olson et al., 2022). Gloria Steinem (1987) wrote an essay about the imagination of a world in which men menstruate. It pictures men cherishing their masculinity during their menstruation, compassion for period cramps and a positive, even competitive attitude towards the heaviness of blood flow. Most importantly, it imagines a society that accommodates for the needs of menstruators. Although this imagination lacks real-world evidence, it brings up an important point: the essay emphasizes the linkage between the lower social status of women and the way a characteristic of their body is treated. This connection between body characteristics and status of a group is the core element of stigmatisation as a mean to enforce power (Olson et al., 2022). Therefore it is highly interesting to look at menstruation within those power dynamics of patriarchy because the way menstruation is seen in society reflects the general position of women and girls in a society (Johnston-Robledo & Chrisler, 2013; Kissling, 1996; McHugh, 2020). In turn, challenging the notion that menstruation is something negative and shameful represents an effort towards gender equality (McHugh, 2020).

Schools play an important role for girls and their rights, as they are entitled to education in a discrimination-free space and education can also be crucial to shape a self-determined future life. The crucial role of schools for gender equality, alongside with the abovementioned present circumstances observed by empirical research in Tanzania, informed the focus of this thesis on the secondary school context in Tanzania.

1.2 Relevance of the study

The question of the connection between patriarchal ideologies and attitude towards menstruation is central to this study and derived from critical menstrual studies. Critical menstruation studies point out that with the popularity of menstruation in the development practice field and research, the gendered nature of menstruation is often not sufficiently emphasised. Instead, distributing pads and addressing an assumed lack of knowledge about how to manage menstruation is often seen as the key to promoting the cause of menstruation

(Bobel, 2019; Hennegan et al., 2019; Olson et al., 2022). There is evidence from Tanzania and beyond that girls feel more prepared after receiving more information and material (Chandra-Mouli & Patel, 2020; Coast et al., 2019; Sommer, 2010b). However, pads and knowledge alone do not lift menstruation out of stigmatisation or challenge society to create a more menstruation friendly environment, nor does it stop the reinforcing cycle of controlling the bodies of women and girls (Bobel, 2019; Olson et al., 2022). Therefore, the patriarchal context needs consideration in research and projects around menstruation (MacLean et al., 2020).

Considerations about the patriarchal influence on the stance of menstruation has been discussed theoretically (Bobel, 2019; Johnston-Robledo & Chrisler, 2013; Wood, 2020). However, only few studies have investigated the connection between patriarchal views and the attitude towards menstruation empirically (Chrisler et al., 2014; Eyring et al., 2023; Forbes et al., 2003) and to the knowledge of the author, none in Tanzania yet. This study will contribute to the empirical field of menstruation by including the socio-cultural context of menstruation through examining the role of patriarchal views and compare it with the effect of knowledge on the attitude towards menstruation. A more comprehensive scope of the socio-cultural context of menstruation entails also to include boys in studies and investigating their attitudes (Coast et al., 2019; Erchull, 2020). Boys play a relevant role as classmates or siblings to the menstrual experience and with increasing age the role extends to partners, fathers, teachers and other positions of power; particularly in more patriarchal communities (Benshaul-Tolonen et al., 2020). Adding the male perspective to menstruation studies is a recent approach with little evidence to date (Coast et al., 2019), underlining the importance of this study. While acknowledging the need for a more inclusive approaches to menstruation research that go beyond binary understandings (Rydström, 2020), the focus of this current study is limited to girls and boys because the regional context, the choice of methods, as well as the limited scope of this thesis.

1.3 Objective and outline of the study

The objective of this study is to investigate the role of patriarchal beliefs and menstruation knowledge on the attitudes towards menstruation, more specifically the attitude about keeping menstruation a secret. A prerequisite for this objective is effective measurements of the study constructs. Therefore, the applicability of the scales in the study

sample will be thoroughly examined for their applicability for the study context and their general strengths and weaknesses as a preliminary objective. To address these objectives, a paper-based in-school questionnaire survey was conducted in Mwanza, Tanzania in February and March 2023.

This thesis is structured in six chapters. First, the theory and the conceptual framework is presented. Secondly a literature review based on the conceptual framework will be discussed showing the body of work on which this thesis builds and pointing to gaps that this thesis aims to address. The next chapter presents the methodology that is applied in this study followed by the report of the results in the subsequent chapter. Finally, the discussion chapter contextualises the results and elaborates strengths and limitations of the study. The discussion closes with recommendations and a conclusion.

II Theory

The chapter begins with gender, gender norms and how gender inequality is understood in the theory of this thesis, leading to the introduction of an inter-group theory, called social dominance theory SDO (Pratto et al., 1994). Afterwards, a definition of attitude is presented followed by an elaboration of stigma and stigma-power (Link & Phelan, 2014) as the linking construct between the main study variables. Finally, knowledge and menstrual health literacy will be explained with a critical lens.

2.1 Critical menstruation studies

The overarching frame of the theoretical constitution of this study is critical menstruation studies. Bobel (2020) described the stance of critical menstruation studies as follows:

Similar to critical race studies or critical gender studies, critical menstruation studies is premised upon menstruation as a category of analysis: asking how systems of power and knowledge are built upon its understanding and, furthermore, who benefit from these social constructions. Critical menstruation studies [...] is a coherent and multidimensional transdisciplinary subject of inquiry and advocacy, one that enables an exciting epistemological clarity that holds significant potential for knowledge production and social transformation. (p.4-5)

Critical menstruation studies go beyond the medical or health-oriented analysis of a bodily function but emphasises the meaning of menstruation. By shedding light on the social meaning of menstruation and its relation to power, it aims to advance a feminist cause which is also implied in a synergy of advocacy and scholarship.

2.2. Gender and gender equality

Gender and gender inequality is a matter of power relations, which are visible on the individual level but also structurally by institutions, discourse culture or the law (Connell, 2013; Connell & Pearse, 2015). Understanding gender as embedded in a net of power-relations corresponds with relevant theories in gender-theory like hegemonic

masculinity and heteronormativity, stating that all deviations (not only women¹) from the hegemonic hetero cis-male ideal, experience a lack of power and a form of domination. (Connell & Messerschmidt, 2005; Kitzinger, 2005)

Accordingly, views this study gender and gender inequality in terms of power, more specifically as the uneven distribution of power among men and women and the hierarchy it creates. This hierarchy is maintained through different forms of exercising this power.

One way to exercise this power are gendered expectations of practices in a society. This is the aspect of gender equality that this thesis focuses on. Those expectations do not only exist about the out-group (the other gender) but are also directed towards the in-group (the gender a person belongs to). In other words, not only men have expectations about gendered practices towards women, but exposure to those norms can lead to internalisation in women's minds. Consecutively, women can hold each other and themselves accountable for the gendered norms (Connell & Messerschmidt, 2005). An example of this are norms to conceal that one is menstruating, which girls learn and witness from their mothers amongst others (Costos et al., 2002; Kissling, 1996). From the outside it seems as a form of complicity of the dominated (female) with the dominators (male) by sharing the legitimising beliefs and living up to norms of this unequal social hierarchy (Pratto et al., 1994). In fact, aligning to norms, consciously or unconsciously, serves to protect oneself from social sanctions and can be necessary to navigate through the social sphere as a member of an oppressed group. An example for these sanctions are menstruating women who are socially punished for revealing their menstruating status by being perceived more negative and less competent (Bobel, 2019; Forbes et al., 2003; Roberts et al., 2002; Wood, 2020). Some studies have discussed internalised gender norms or acceptance of harmful behaviour against women in Tanzania. The evidence highlights that navigating through patriarchal structures as a woman is more complex and nuanced in reality than opportune adherence to norms or rebellion against them (Jakobsen, 2014, 2018; Tao, 2019; Wood,

¹ Critical menstruation research acknowledges that "not all women menstruate and not all who menstruate are women" (Rydström, 2020, p. 945) and a more inclusive approach is needed to highlight the reality of all menstruators and how those realities are influenced by patriarchal power. However, this study was only able to focus on girls and boys, based on reasons that were mentioned in the introduction.

2020). This structural function of those imposed norms by the more powerful group is encompassed in theories of intergroup power relations, such as the one that is presented in the next section.

2.3 Social dominance theory

Social dominance theory (SDT), is a theory of intergroup relations, rooted in social psychology. It examines group-based social hierarchies, and how these hierarchies remain stable and reproduce themselves (Pratto et al., 1994; Sidanius & Pratto, 2001). According to the theory, group-based inequalities are maintained through four primary mechanisms (Sidanius & Pratto, 2001), which are presented below with the theorised links to menstruation by this study.

1) Identifying group inequality

The baseline of the theory is the attribution of people to groups and the self-identification with a certain group. These groups can be socially constructed and highly context dependent (tribes, class, religions etc.) and are referred to as *arbitrary sets* in the theory. Opposed to that there are *specific sets*, which are groups divided by gender and age. Adults rule over children and men often have more powerful roles and positions in societies than women. The difference between *specific sets* and *arbitrary sets* is that the *specific sets* exist in all societies and are stable over time while the *arbitrary sets* are only salient in particular settings. Women and men, the two compared groups in this study are *specific sets*. Further, menstruation as a symbol of womanhood makes the groups even more salient (Johnston-Robledo & Chrisler, 2013; Sommer, 2010b).

2) Justifying group inequality

“A justified hierarchy enables discrimination” (Sidanius & Pratto, 2001, p. 2.). Myths that are widely accepted and recognized about the subordinated group, provide moral and intellectual justification for the intergroup behaviours by disguise the privilege as “normal”. There is a wide range of myths and narratives existing about menstruating girls and women, like being unclean, irritable or less competent (Bobel, 2010; Roberts et al., 2002; Sumpter & Torondel, 2013).

3) *Reinforcing group inequality*

Systematic reinforcement by institutions means for instance access to better health care opportunities or education for the privileged group. It also includes allocation of goods and power, as well as promotions of members of the dominant group. These institutions can be for instance laws, schools, hospitals, the economic market and the police. An example for this is the 'period tax' which is a widely discussed topic in public discourse currently. Period products are an item of necessity for menstruating women, however the taxation categories for the products do not reflect that in most of the countries. These taxes (the usual sale tax or luxury tax in some cases) increase the already considerable costs that women have to pay to manage their period; whereas other products of necessity have a lowered tax or are exempted from taxes. The unique and considerable financial burden of menstruating women imposed by the market and the lacking protection by tax policy in the vast majority of states, reinforces gender inequality (Weiss-Wolf, 2020).

4) *Stabilizing group inequalities*

This describes a response to the pressure for equality that is rising in inequal societies. "There are two primary means by which dominant groups maintain their hegemonic position over subordinate groups: the threat or actual exercise of naked force, and control over ideology and the contents of "legitimate" social discourse" (Sidanius & Pratto, 2001, p.4). Strategies to maintain power vary significantly in strength and can range from subtle use of discourse to active repression and forms of violence. Pushing menstruating girls to keep their menstruation secret by all means, behavioural restrictions or even period teasing (Benshaul-Tolonen et al., 2020; Marván et al., 2006; Sommer, 2009) is aligning with the understanding of stabilizing mechanisms of male superiority.

The SDT has been used to describe and explain many different group-based power relations or conflicts based on social categories like ethnicity and class. It posits that the sum of individual attitudes about equality and power distribution aggregates to a macro-level phenomena, which produces structural discrimination (Ho et al., 2015). In this study, SDT is applied on attitudes about groups based on gender.

2.4 Attitude

Eagly and Chaiken (1993, 2007) have defined attitude as "a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor" (Eagly & Chaiken, 1993, p. 1). According to the authors, an attitude encompasses three key features of the definition, which will be explained in detail below. The theoretical elaborations are accompanied with examples regarding the attitude towards menstruation.

1) *Directedness*

An attitude is directed towards a particular object, also called entity. This entity can be specific like a dish or a movie or more abstract like a political orientation or religion. It can be directed towards an individual object (for example a pet) or a more collective topic (like taxes). The directiveness of attitude towards an entity is important to highlight, as it distinguishes it from more diffuse affective responses such as moods. In this study is menstruation the entity. It is addressed on a collective dimension, asking boys and girls about the concealment of menstruation in society as a norm.

2) *Evaluation*

The evaluative response to an entity can be positive or negative. This evaluation can be openly expressed by a person or happen as an internal. It can consist of an affective (emotions), cognitive (beliefs, opinion) and behavioural (actions) component. Menstruation covers all three components: its negative connotation such as disgust (affective), shared narratives or knowledge (cognitive) as well as expectations and practices like concealing the menstruation (behavioural).

3) *Tendency*

The choice of the word "tendency" is significant. It implies that an attitude is not as fixed and pre-determined as a disposition but also not as fluid as a state. It develops through previous interactions with the entity. Those interactions might be direct or observed. For instance, if a person is repeatedly exposed to advertisements that communicate that menstruation is an unhygienic state, it is more likely that his or her evaluative response to the entity menstruation will be the same. This is also relevant in the evolution of gender norms and socio-cultural influences. An attitude towards something does not occur by its own. In turn, understanding an attitude as a tendency,

emphasises the possibility to change attitudes as well by positive interactions with the entity.

The attitude definition of Eagly and Chaiken (1993, 2007) is suitable for this study's objective and framework. Menstruation attitude is directed towards the entity of menstruation, it is socially constructed) and it is an evaluative response visible in opinions, behaviours and emotions.

The key features of an attitude can be found within the SDT as well. The entity is the in-group and out-group and their members. The evaluation is informed by the myths (cognitive) that lead to favouring or disfavouring of groups (affective) and it leads to actions to reinforce and stabilize the hierarchy (behavioural). Finally, it is a tendency that is socially constructed through previous first- or second-hand interactions in which the groups were salient. Moreover, according to attitude theory and other social theories (like the contact-hypothesis) it can be changed through exposure, through contact or education for instance (Allport et al., 1954; Eagly & Chaiken, 1993, 2007).

2.5 Stigma

The stigma around menstruation has many levels and dimensions. However, it is agreed by many scholars that the menstrual blood that exits the female body, is the symbolic anchor of the stigmatisation (Chrisler et al., 2014; Grosz, 1994; Longhurst, 2001; MacLean et al., 2020; Wood, 2020). A central elaboration of body fluids and its declaration as impure has been made by Mary Douglas in her work *Purity and Danger* (2002). There, she related the idea of impurity to the location of an object, as *a matter out of place*. In other words, what is outside of a clear category or outside of the usual locality is considered as impure or dirty; which applies to leaking bodily fluids that cross the bodily boundaries such as menstrual blood according to her. Furthermore, her work discusses the symbolic value, power and the many implications of this connotation as dirty. She stated that the classification of pure and impure is learnt through socialisation and mirrors current social hierarchies, such as male dominance (Douglas, 2002). Menstrual blood is an exclusive bodily fluid of women's bodies which opens a discussion about groups divided by gender, power and the meaning of bodies, deviation and control. These aspects are covered in the theory of stigma-power (Link & Phelan, 2014), which has been applied to attitude towards menstruation before (Olson et al., 2022). In this study,

stigma-power is the linking theoretical concept between social dominance theory and attitude towards menstruation.

Link and Phelan (2014) state that: “stigmatisers have strong motivations to keep people down, in or away and (...) they best achieve these aims through stigma processes that are indirect, broadly effective, and hidden in taken-for-granted cultural circumstances” (p. 1). The negative attitude towards a characteristic of the inferior group is in fact exercising symbolic power. Link & Phelan (2014) draw from Bourdieu (1987, 1990), who states that symbolic power represents the worth of both groups (stigmatisers and stigmatised). Stigmatised groups are heavily influenced by this symbolic power, which can be more or less conscious and become self-internalised. It is seen as a fixed part of norms and culture by both, the stigmatisers and stigmatised. This self-internalisation enables the stigmatiser to exercise this symbolic power in a non-confrontative, subtle way that serves the stigmatisers to preserve their privileged position (Bourdieu, 1987, 1990; Link & Phelan, 2014); just as explained in SDT as well (Pratto et al., 1994)

What are the key functions of stigma-power and how do they relate to the attitude towards menstruation, or more precisely the attitude towards keeping menstruation a concealed topic? The three key functions are explained and linked to menstruation in the following paragraphs (Link & Phelan, 2014; Olson et al., 2022; Phelan et al., 2008).

1) Keeping people down

“Some groups must have less power and fewer resources for dominant groups to have more” (Phelan et al., 2008, p. 363). Therefore, ideologies and narratives are necessary to legitimise and maintain power structures (another commonality with SDT). Stigma functions to legitimise and maintain power structures, also when it comes to attitude towards menstruation. Menstruation is a unique feature of women’s bodies and therefore are discriminating circumstances for menstruation in fact a discrimination of women and girls (Bobel, 2019; Johnston-Robledo & Chrisler, 2013; Kissling, 1996). Being actively stigmatised because of the menstruating status through bullying or just in constant worry of revealing the menstruation status in school entails that girls are disadvantaged in their academical performance compared to boys and restricted in

their right for education (Benshaul-Tolonen et al., 2020; MacLean et al., 2020; Sommer, 2010b).

2) *Keeping people in*

Societies are organised as a web of written and unwritten rules, to which people should conform. Stigma addresses everything outside those norms (resonating with Douglas' term of a *matter out of place* (Douglas, 2002)), being an indirect way of norm-enforcement. Hiding the period and everything that is related to it, like period products, is a norm in many societies. Having stains or showing otherwise that one is menstruating is therefore considered inappropriate and is socially punished. Research showed that already an unused tampon falling out of the bag of an interviewee decreased her competency rating by others, which was not the case for a dropped hairclip in the control group (Roberts et al., 2002). Another example of this is the recent case of the Kenyan senator who had to leave the plenum because she had visible period stains, which was seen as a dishonouring the institution. She received hate and threats of sexual violence afterwards (Kimeu, 2023).

3) *Keeping people away*

For the question about what becomes an object of stigma and what does not, many turn to evolution psychology. Stigma seems to have evolved around things that seemingly could harm one's health or the health of descendants. However, this describes more the far past of stigma instead of social dynamics nowadays (Phelan et al., 2008). Still, all forms of "deviations from the organism's normal (...) appearance such as asymmetry, marks, lesions and discoloration (...) excretion of fluids" (Link & Phelan, 2014, p. 25) are objects of stigma and people stay away or expect concealment from those affected. For example, cis-male bodies are considered the norm in most societies and a bleeding female body is seen as a deviation (Bobel, 2019). In some communities restriction are practiced, which prohibit menstruating girls and women to use common items or facilities or going to social or religious gatherings (Chandra-Mouli & Patel, 2020; Hennegan et al., 2019). A recently discussed case is Chhaupadi, an illegal tradition in Nepal that is nonetheless still practiced in some parts of the country. Menstruating women and girls have to stay isolated in a separate, simple hut

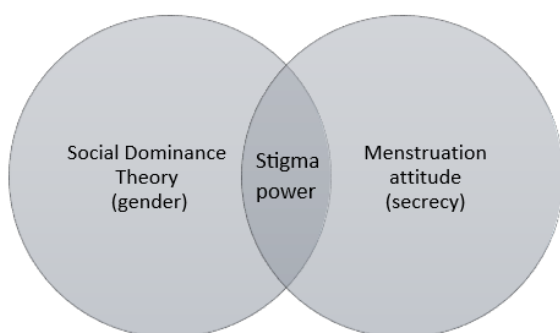
during their menstruation in order to prevent ‘pollution’ of the rest of the community. This year there was an incident where a girl died through a snake bite while practicing Chhaupadi what drew public attention to this tradition (Plesons et al., 2021; Rojita, 2023).

The elaborations showed that the theory of stigma-power understands stigma in the context of groups and power and directs it towards embodied traits of those group. Therefore, it represents the linking theoretical construct of the two study variables and their theories: SDT and the concealment or secrecy aspect of the attitude towards menstruation (see figure 1).

The gendered cultural norms of concealment and secrecy of menstruation, expressed in attitudes, could be a power-exercise aiming to maintain the social hierarchy of men and women by stigmatising menstruation as such. Understanding menstruation as a structural topic within power relations resonates with the core idea of critical menstruation studies “[m]enstruation is fundamental, because it is ultimately about power relations” (Winkler, 2020 p. 12).

Figure 1

The theoretical visualisation of social dominance theory, stigma power and menstruation attitude



Note. Own work.

2.6 Knowledge about menstruation

The scientific term that is used for knowledge about menstruation is menstrual health literacy, derived from the term health literacy defined as “the degree to which individuals can understand, obtain and process health information and services” (Holmes et al., 2021, p. 2).

The focus in this study is set on the aspect of understanding menstruation. That is, having knowledge about menstruation and its key facts as well as understanding what it signals, such as health and not being pregnant. The terms menstrual health literacy and knowledge will be used interchangeably.

Knowledge relates to both, SDT and attitude towards menstruation. The myths and beliefs about groups and their characteristics are drawn to justify group inequality (Sidanius & Pratto, 2001). Myths and beliefs are a central component of SDT and they are cognitive units, like knowledge. In the theoretical construct of attitude, as explained previously, the evaluation feature of attitude is three-fold (cognitive, behavioural, affective). People draw on the facts that are available for the cognitive evaluation of an entity. Therefore, knowledge or menstrual health literacy matters for the attitude towards menstruation theoretically (Eagly & Chaiken, 1993, 2007). Knowledge about menstruation has also proven its relevance empirically, being a predictor to decrease negative emotions towards menstruation (Benshaul-Tolonen et al., 2020; Chandra-Mouli & Patel, 2020; Coast et al., 2019; Holmes et al., 2021). However, if the way of teaching uses negative narratives about menstruating girls and women it can also foster stigma and prejudices about menstruating girls and women (Bobel, 2019; Chrisler et al., 2014; Olson et al., 2022).

Finally, critical menstruation studies demand a critical discussion of the concept menstrual health literacy, particularly for studies conducted in the global south, which is provided by Bobel (2019). The understanding of menstrual health literacy is influenced by what the western public health perspective determines as helpful knowledge for people's health and menstruation. Further, local knowledge and context needs acknowledgement, instead of setting the form of knowledge in the west as a standard and declaring deviations from this standard as primitive. Displaying women and girls from the global south without agency and knowledge about their own bodies feeds a problematic narrative of white supremacy and saviourism in both, projects but also research. Girls can experience increased stress when their practices are declared as poor and the advice practices are not feasible to perform due to limited resources (Hennegan et al., 2019). In addition, menstrual health literacy should shift the focus away from overly detailed biological information about menstruation, to an approach that aims to empower girls to make autonomous and informed decisions about menstruation and reproductive issues in general (Olson et al., 2022). Beyond

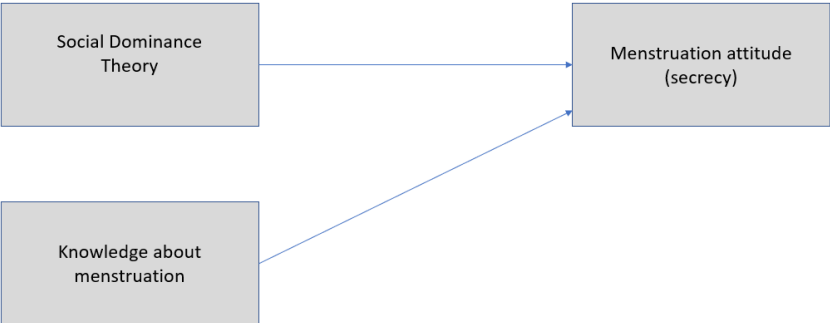
that should boys be included in the target group of enhancing menstrual health literacy instead of expecting girls alone to carry the responsibility of enhancing the situation around menstruation (Bobel, 2019). Despite all the critical considerations, of Bobel (2019) and others (Olson et al., 2022) advocate to keep menstrual health literacy in the focus of research and projects as it has proven its potential to ease stress and increase health (Benshaul-Tolonen et al., 2020; Chandra-Mouli & Patel, 2020; Coast et al., 2019; Holmes et al., 2021). Hence, includes this current study knowledge in the conceptual framework of this study, while following the abovementioned recommendations (Bobel, 2019; Olson et al., 2022).

2.7 Conceptual framework of the study

The theories informed the conceptualisation of the study. The concepts under investigation are displayed in figure 2.

Figure 2

Overview of the conceptual framework of the study



Note. Own work.

III Literature review

To the author's knowledge, is the first study to specifically conceptualise these study variables (see Figure 2). However, the existing body of research on menstruation, stigma and patriarchal structures has influenced the interest of this study. Therefore, studies with similar conceptualisations or closely related constructs will be presented. The current study aims to build on this literature and in turn contribute to knowledge in this area of research.

The chapter begins with a presentation of research on SDT in the context of gender, patriarchal structures and sexism. Secondly, the general body of research on the menstrual experience of girls in LMIC is mapped out to provide context, with a subsequent focus on the socio-cultural context, stigma and attitudes surrounding menstruation in LMIC and its relation to patriarchal roots. The literature-review concludes with case studies conducted in Tanzania. Finally, the rationale for the study is presented which is nurtured by the presented literature but also by remaining gaps identified throughout the literature review.

3.1 Social dominance orientation and gender

Social dominance orientation (SDO) is the empirical operationalisation derived from the SDT and “captures the extent of individuals’ desires for group-based dominance and inequality” (Pratto et al., 2006, p.281). The terms SDT and SDO are used interchangeably in the literature, while empirical studies predominantly use the term SDO for both, the theoretical concept as well as the empirical variable. This thesis will adopt this modality in the following chapters.

SDO has been widely researched and has shown positive relationships with sexism, conservatism, nationalism, patriotism, prejudice, support for harsh penalties and right-wing authoritarianism (Pratto et al., 2006). In more experimental designs, participants with high scores of SDO showed to allocate resources (Amiot & Bourhis, 2005) and jobs unevenly based on salient group identities (Dambrun et al., 2004), which showcased that SDO as an attitude can have implications for discriminating behaviour against other groups. Pratto et al. (2006) stated that setting a prime in empirical studies made certain groups and group identities salient, which allows the investigation within a defined context. The groups of interest in this study are based on gender, which will be primed accordingly.

The relationship of gender and SDO is two-fold. On the one hand, gender is one of the two *specific sets* (gender and age) that are a subject to inter-group dynamics and an unbalanced distribution of power (Sidanius & Pratto, 2001). On the other hand, men showed higher SDO scores than women, across contexts. This difference between men and women is a consistent finding of many studies and is called invariance-hypothesis² (Pratto et al., 2006).

Empirical research showed that SDO is closely related with gender discrimination and sexist views (Fox & Tang, 2014; Rollero et al., 2021; Sibley et al., 2007). For example predicted SDO more traditional views about gender roles including a sceptical view about women entering the workforce (Christopher & Wojda, 2008). High SDO- scores (of male participants) were also related to dismissive views on reports of sexual assault and power abuse (Szekeres et al., 2020). Additionally, participants who scored higher on SDO were less likely to perceive the restriction of freedom as an act of violence against women than participants who had lower SDO scores (Rollero et al., 2021). The limitation of freedom is in fact a way to control a person and reminds of the behavioural restrictions that some women and girls face when they are menstruating, like restricted participation in religious activities that some studies report (Chandra-Mouli & Patel, 2020). SDO also predicted the response to romantic rejection by men. Men with dominant views were more likely to blame the women for the rejection, not taking it seriously and respond with manipulative, persistent and aggressive behaviour (Kelly et al., 2015). Two studies addressing the gaming and online environment also found that high SDO scores are associated with endorsement of sexist beliefs about female gamers and the exercise of aggressive behaviour (cyber aggression) towards female members of the community (Fox & Tang, 2014; Jagayat & Choma, 2021). All those studies were conducted in the global north, and no such study has been conducted in the Eastern-African context yet, to the knowledge of the author. However, the presented research shows solid evidence that SDO is relevant in the context of gender roles and power relations between men and women. Moreover, in all those studies that included women and men in the sample, men scored higher than women in SDO (Christopher & Wojda, 2008; Fox & Tang, 2014; Jagayat & Choma, 2021;

² The term “invariance” has a specific meaning as a statistical term. However, within SDO research the term is used to describe the stability of higher SDO score for male participants than for female participants across contexts and study designs.

Rollero et al., 2021; Szekeres et al., 2020) supporting the invariance-hypothesis (Pratto et al., 2006).

The vast majority of research regarding SDO is focused on adults and SDO research with children is still relatively rare, although it is relevant. Research showed that the presence of prejudices against other groups increases throughout childhood. While simple prejudices in early childhood was concluded to be a result of limited cognitive flexibility, seemed older children to use their gained cognitive flexibility to identify and compare groups by their traits (Raabe & Beelmann, 2011). Further, not only prejudices but also explicit attitude towards intergroup-hierarchies were expressed by children and adolescents in studies (Mandalaywala et al., 2020; Reifen-Tagar & Saguy, 2021). In one example, children under the age of seven used race and gender as cues for social status (girls and people of colour were seen to have lower status, also by girls and people of colour themselves). Defining groups and attributing them to position serves the navigation through the complexity of society for children (Aboud, 2003; Cadamuro et al., 2022; Doyle & Aboud, 1995). Obviously, this can lead to harmful consequences for those children assigned to these low-status groups. One study that actually applied the concept of SDO in a study with children, has therefore investigated how contact between groups can affect prejudices held by children. It showed that high SDO scores had more resistant prejudices even after extensive contact with the other group (Vezzali et al., 2018). Another study that applied SDO in a study with children confirmed the invariance-hypothesis (Cadamuro et al., 2022). The conduction of the presented studies with children and adolescents was, like the studies with adult samples, in the global north.

3.2 Menstrual experience and knowledge about menstruation in LMIC

An increasing amount of research has been conducted on girls' menstrual experiences in LMIC through different approaches, such as qualitative and quantitative studies and literature reviews. The following sections will outline the current state of this research and highlight topics that are particularly extensively covered in research and topics that have been collectively identified as lacking attention.

Girls reported to feel unprepared when experiencing their menarche while the onset of their menarche marks the point in time when they start learning about it; mostly from their mothers or other female relatives (Chandra-Mouli & Patel, 2020; Coast et al., 2019). Stress

and anxious feelings during menstruation were reported by girls due to different reasons, one being the insufficient circumstances to deal with their menstruation which can be missing access to products for managing the blood flow or pain or insufficient facilities in school and at home to change or clean these products (Chandra-Mouli & Patel, 2020; Coast et al., 2019; Hennegan et al., 2016; Shannon et al., 2021). Another factor that could be found that contributes to a stressful menstrual experience is knowledge about menstruation, which is extensively covered in research (Chandra-Mouli & Patel, 2020; Coast et al., 2019; Hennegan et al., 2016; Hennegan & Montgomery, 2016; Sumpter & Torondel, 2013). Intervention studies, which usually consisted of educational sessions and were partly featured by the distribution of menstrual products, found a positive effect of these interventions on knowledge and MHM practices (Hennegan et al., 2016; Hennegan & Montgomery, 2016; Sumpter & Torondel, 2013) (while the definition of 'good practice' was not precisely defined and the vague idea of it was oriented on western ways of managing the menstruation (Sumpter & Torondel, 2013)). However, the effect of those interventions showed to be influenced by the social environment of the girls being families, teachers and friends. Even if knowledge and good MHM practices could be enhanced through interventions and they felt less scared about the occurrence of the bleeding and more confident about the usage of products (Bobel, 2019; Coast et al., 2019; Holmes et al., 2021) the stress somewhat remained in environments where negative attitude towards menstruation were still prevalent (Chandra-Mouli & Patel, 2020; Hennegan et al., 2016; Sumpter & Torondel, 2013). Studies found that negative attitudes towards menstruation fostered the fear of leaking and hinder girls to ask for support even though they theoretically know what they would need and it would be technically accessible (MacLean et al., 2020; Shannon et al., 2021). Girls reported it was difficult to focus on their academic performance while being stressed about leaking or experience physical discomfort and pain (Hennegan et al., 2016; MacLean et al., 2020), which implies that negative menstrual experience can affect participation of girls in public life.

Most of the literature summarised in those reviews and studies showed that girls in LMIC reported considerable challenges and stress during their menstruation (e.g Hennegan et al., 2016). Knowledge, MHM and the association of these two concepts are prominent topics studied, often influenced by a public health perspective (Chandra-Mouli & Patel, 2020; Coast

et al., 2019; Hennegan & Montgomery, 2016; Sumpter & Torondel, 2013). However, the reviews emphasised that future studies need to address the social-cultural context of menstruation rather than isolating the topic with girls as the only agents (Chandra-Mouli & Patel, 2020; Hennegan et al., 2019). Allocating scholarly attention to the socio-cultural context has the potential to address menstrual stigma and negative attitudes towards menstruation by its roots.

Generally, publications stated that the overall quality and comparability of quantitative empirical studies in the menstruation field has room for improvement and that this could be achieved through standardised scales of good quality, amongst other measures (Coast et al., 2019; Phillips-Howard et al., 2016; Plesons et al., 2021; Shannon et al., 2021; Sumpter & Torondel, 2013).

3.3 Menstruation in a socio-cultural context of stigma and patriarchy

The stigma surrounding menstruation is of reciprocal nature. Research showed that the stigma of menstruation is rooted in gender inequality and in turn the implications of the stigmatisation, like concealment or imposed restrictions on menstruating girls and women, fosters the maintenance of gender inequality (MacLean et al., 2020). In the next section, articles will be presented that have a particular focus on how gender and power-relations shape the stigmatising and attitude regarding menstruation and vice versa.

Critical voices state that many initiatives “might have succeeded in breaking the silence around menstruation, but stigma cannot be broken as easily. We first need to recognise its (invisible) power and its impact in all spheres of life in order to actively challenge, dismantle, and redefine it” (Olson et al., 2022 p. 1). The critique on projects and initiatives extent that it would be more important to challenge the social norms of concealment and stigma around menstruation instead of focusing on how to equip girls to keeping their menstruation secret and align to the norm (Bobel, 2019; Olson et al., 2022). Another work highlights that the norms that are told to menstruators are conflicting at times: menstruators should be proud of their healthy body that is bleeding and at the same time conceal it by all means (Persdotter, 2020).

Often, behavioural restrictions are seen as implications of the stigma and negative attitude towards menstruation by scholarship (Benshaul-Tolonen et al., 2020; Cardoso et al., 2021; Chandra-Mouli & Patel, 2020). Some see those restrictions as a showcase of exercising patriarchal power (MacLean et al., 2020). Those restrictions differ between settings and cultures. In Tanzania studies reported that some households expect women to avoid preparing food and stay away from social gatherings (Benshaul-Tolonen et al., 2020). To shed light on different sides of this discourse, a current article emphasises that some of these are seen as a release from domestic duties by some women. However, the authors emphasise that having the choice to either seek isolation during menstruation or participate as usual is key (Hennegan et al., 2021). Nevertheless, highlighted research that girls lack freedom even outside the scope of direct restrictions as they are occupied and struggling to manage their menstruation in a social reality in which menstruation is not supposed to take place at all (MacLean et al., 2020) which according to the authors comes from "deeply internalized and patriarchal values that have permitted powerful constructions of menstrual blood as harmful and polluting." (MacLean et al., 2020, p. 8).

The intersection of patriarchal structures and the stigmatisation of menstruation resonates with the theoretical elaboration that "the problem of menstruation is stigma, an artefact of sexism" (Bobel, 2019, p. 285), and that the patriarchal view of femininity and womanhood denigrates the "woman qua woman" (Bobel, 2019, p. 286), and so it would only be consistent to stigmatise menstruation as part of a woman's physiology (Bobel, 2019; Eyring et al., 2023; Johnston-Robledo & Chrisler, 2013; Kissling, 1996; MacLean et al., 2020).

The empirical study of the patriarchal roots of menstrual stigma benefits from the inclusion of male participants in menstruation studies. To date, there are only a few studies that have done so, especially quantitatively (Benshaul-Tolonen et al., 2020; Cheng et al., 2007; Chrisler et al., 2014; Eyring et al., 2023; Marván et al., 2006; Wong et al., 2013). However, existing evidence shows that negative attitudes towards menstruation are associated with sexism and misogynistic views held by men (Chrisler et al., 2014; Eyring et al., 2023; Forbes et al., 2003). Furthermore, in comparative studies, male participants reported more negative attitudes towards menstruation and expressed more support for menstrual concealment than

female participants (Cheng et al., 2007; Eyring et al., 2023; Forbes et al., 2003; Peranovic & Bentley, 2017; Wong et al., 2013).

3.4 Case studies in Tanzania

When reviewing studies regarding menstruation in Tanzania, the work of Sommer and colleagues is prominent (2009, 2010a, 2010b, 2013, 2015). Sommer investigated qualitatively how the influence of traditionality, myths and taboos restrict girls in their well-being and freedom. Secrecy and concealment of menstruation showed to be omnipresent (Sommer, 2009, 2010a). However, an interesting insight in one of her works about beliefs and myths was that adult women, for example the mothers, do not believe that the myths (such as touching water sources or animals when on period causes contamination) are true. In fact, they reported to share those myths with their daughters to motivate them to be “hygienical” in general (Sommer, 2010a). This is an interesting insight that challenges the view on myths, or even the categorisation of narratives as myths that have to be overcome by knowledge. Those myths actually have the potential to carry useful knowledge or practices regarding menstruation. This in turn aligns with the stance of critical menstruation research which demanded a more nuanced view on narratives and practices present in different regions of the world instead of dooming them as backwards (Bobel, 2019).

Besides female relatives, teachers are role-models and gatekeepers as well, which makes evidence from the general school settings in Tanzania interesting. This evidence is provided in four points by Sommer and colleagues (2010a): Firstly, schools in Tanzania are structured very hierarchal, which affected the students to open up to teachers. Secondly, in rural schools, positions of power are in most cases occupied by men, which was concluded as another obstacle to ask for support of any kind when menstruating such as communicating severe pain, asking for pads (in some schools pads are available for "urgent situations" in the school staff office), pain killer or general advice on MHM. Thirdly, even though menstruation is in the national curricula, teachers admitted skipping the topic sometimes because they reported to feel unprepared to teach it. Fourthly, even if students received lessons about menstruation that information happened to be conflicting with information received from female relatives, according to the schoolgirls. Both student and teacher, reported that they would prefer external educators, which are well-prepared and not part of any hierarchal

dynamics to give guidance in reproductive and menstrual (Sommer, 2010a). Girls in rural and urban Tanzania face an adverse school environment when menstruating influenced by the fear of leaking, bullying by boys, distraction due to pain or the stress of shame (Sommer, 2010b, 2013; Sommer et al., 2015). Sommer concluded many of her works with formulating the need of further empirical data addressing particularly the socio-structural reality of menstruation (e.g. Sommer, 2013).

As discussed earlier this socio-structural picture does also include boys and men, as they are active agents (Bobel, 2019). In the context of East-Africa there is little quantitative evidence from studies including boys and girls so far. Worth mentioning are two currently ongoing longitudinal intervention trials in the pilot-phase, one in Uganda called MENISCUS (Kansiime et al., 2020) and one in Tanzania called PASS-MHW (Okello et al., 2022) with non-published results to date. Only one quantitative study with a sample including boys and girls is published yet (Benshaul-Tolonen et al., 2020). The results showed, contradictory to findings in other studies (Chandra-Mouli & Patel, 2020; Coast et al., 2019) that the girls and boys of the secondary schools in fact had a decent knowledge about menstruation but still a rather negative menstruation attitude and that period teasing was present in school. The boys in the sample of the study strongly preferred girls only talking to other females about their menstruation. Further, period teasing was experienced and exercised by some, observed by many and the fear of being teased was a present concern by almost all girls in the study. The girls also reported that their participation and concentration in the classroom was lower as usual when on their period, because period cramps but also due to fear and shame. Some particularly reported anxiousness to stand up and answer questions of the teachers, because of the risk of revealing possible stains. This all shows a stressful environment for menstruating girls in schools (Benshaul-Tolonen et al., 2020).

In this study knowledge did not influence the negative attitude or the teasing but a significant relationship has been found between the exercise of period teasing of male students and restrictions for menstruating women/girls at those male students' homes (Benshaul-Tolonen et al., 2020). Although this was just reported and not comprehensively discussed in the study, it could be possible that those homes imposing restrictions have more salient patriarchal structures that influence the boys in their attitude and behaviour. This

possibility awakened interest in investigating it further and dig deeper in those psycho-social structures of patriarchal nature that might influence the negative attitude of boys (and girls respectively). How this current study explores this connection as well as builds on and enriches the body of literature, will be explained in the rationale.

3.5 Rationale

The novelty and relevance of the study is anchored indifferent key points, which will be presented in this section.

First, the important aspect of the socio-cultural embedment of menstruation is rarely investigated in quantitative studies (Hennegan et al., 2019; Hennegan & Montgomery, 2016). Qualitative studies first revealed the holistic and social reality of menstruating women and girls in LMIC, which can now be followed up by quantitative studies (Hennegan et al., 2019), which in turn can make a unique contribution to the body of knowledge due to the methodological potential. Quantitative methods allow accurate comparisons across contexts and time and enable to conduct studies with a large number of participants. Furthermore, offer quantitative studies the potential of replicability, which makes previously found evidence available for comparison, verification or falsification which ultimately contributes to the scientific integrity of knowledge (Punch, 2014; Yilmaz, 2013). However, this requires standardised measures of good quality, which are warrant for the current field of menstruation study (Phillips-Howard et al., 2016; Plesons et al., 2021). Therefore, in this study established measures - for patriarchal beliefs, knowledge about menstruation and attitude towards menstruation- are assessed in detail in the first step of the empirical part. This careful examination of the measurement encompasses how accurately the relevant concepts are captured by the measurements and how applicable the scales are in different contexts, like the Tanzanian context. This in turn, enables comparable and solid evidence in the field for the future.

In the second step of the empirical part are the study variables of interest set in relation. Some studies have found the relationship between knowledge and menstruation attitude (Chandra-Mouli & Patel, 2020; Coast et al., 2019) while others found an association of sexist views and attitude towards menstruation (Chrisler et al., 2014; Eyring et al., 2023; Forbes et al., 2003). However, a specific comparison between patriarchal beliefs and menstruation knowledge and

their association with attitude towards menstruation, more specifically the attitude towards keeping menstruation a secret has not been done yet to the knowledge of the author, particularly not in the regional context of Tanzania. Relating those two concepts knowledge and patriarchal beliefs with the attitude towards menstruation responds the goal of interventions and policies targeting adolescents. Those aspiration usually aim to increase MHM and make students more comfortable with talking about the topic of menstruation by educational sessions. However, they often lack to address the socio-cultural picture and the gendered nature of the stigma that surrounds menstruation (Bobel, 2019; Chandra-Mouli & Patel, 2020; Sommer, 2009). Addressing the whole socio-cultural picture also entails to include boys, as they contribute to the social situation of menstruation girls. The inclusion of boys is still scarce in the menstruation field, as said before, and has only been done in one previous study in this regional setting yet (Benshaul-Tolonen et al., 2020). The current study involves both boys and girls.

In a recent commentary, a group of experts from different domains of menstrual health, including the social sphere, formulated what kind of research is needed for the domain of stigma, gender norms and socio-cultural practices around menstruation:

Firstly, consensus must be reached on a standard set of validated indicators to assess stigma, gender norms, and gender inequality related to menstruation. Secondly, evidence is required on the effectiveness (...) of interventions to address [menstruation] stigma, as part of broader interventions to address harmful gender norms and gender inequality. (Plesons et al., 2021, p. 4).

This study with its quantitative approach, its specific variables of interest, the corresponding measurements and the sample including boys, addresses the stated needs well and aims to contribute to this remaining gap by the following research questions.

Research question one: To what extent can the selected scales– beliefs and attitude towards menstruation (secrecy dimension), social dominance orientation and knowledge about menstruation –be applied in the context of secondary schools in Mwanza, Tanzania?

Research question two: To what extent is there a relationship between social dominance orientation and attitude towards menstruation?

Research question three: To what extent are social dominance orientation and menstruation knowledge associated with attitude towards menstruation?

Research question four: Is there a significant difference by sex in the association between social dominance orientation, knowledge about menstruation and attitude towards menstruation?

IV Methodology

The following chapter introduces to the methodology of this study. Firstly, the philosophical foundation of the study will be discussed. This is followed by introducing the research design and the procedure of sampling and collecting data with the survey in the specific region of Mwanza, Tanzania. After elaborating the regional setting of the study, the variables are presented, followed by the questionnaire design. Consequently, the used methods for the data management and analyses on the measurement level as well as between the variables will be described. The chapter closes with the discussion of quality assurance and ethical considerations while planning and conducting this study.

4.1 Philosophical foundation of the study

The matters of social sciences are complex, multi-perspectival and influenced by many dynamics. To contextualise findings of a scientific work, scholarship has agreed on certain assumptions that build a paradigm. The assumptions are rooted in central questions about the work and the process that are linked to philosophy and influence the choice of methods and the general approach of the study (Punch, 2014).

The paradigm that builds the methodological base for this research is critical social science. Critical social science advocates for the promotion of equity and sees empirical realities not as neutral and objective but as interpretations and ideas. Reality can only be captured partly and is influenced by values, concepts, and theory. However, critical social science also acknowledges real conditions and structures on a larger scale such as oppression, discrimination and violence. This paradigm allocates more weight to those macro-structures than to subjective stories and ideas on a micro-level (Neuman, 2014). This current study measures attitude about menstruation and patriarchal structures, being subjective views of the participants informed by their socialisation. However, when aggregated it creates structures that affect the circumstances for (menstruating) girls, which also aligns with SDT; stating that the sum of many hierarchal attitudes create oppression on the macro-level (Ho et al., 2015). Investigating the attitude towards menstruation through a lens of patriarchal power can be seen as an effort towards equity and corresponds therefore to the orientation of critical social science.

Feminist analysis is closely related to critical social science or positioned within it (Neuman, 2014). It has advocacy for feminist causes and challenges common practices of science that do not sufficiently capture and emphasize realities of marginalized groups, like women (Campbell & Wasco, 2000; Wigginton & Lafrance, 2019). In methodological discussions of feminist scholars, quantitative methods have been criticised as being insufficient to reflect women's realities by using categorisations and testing theories that were developed with men as the universal norm in the past (Wigginton & Lafrance, 2019). However, feminist empiricists argue that quantitative research can contribute majorly to the progress of feminist research and movements and has done so in the past (Wigginton & Lafrance, 2019). When being aware of the abovementioned pitfalls, it can be conducted in a non-sexist way and expose oppressing structures on a macro-level (Campbell & Wasco, 2000). Moreover, quantitative data about women's realities help to address the gender-data gap. The gender-data gap describes the prevalence of male data all over disciplines and sectors. Data based on the male norm shapes many systems, for instance cities or the health care system. This can have negative implication for women, because they live within those systems designed for men (Perez, 2019). Gathering data that highlights female realities is therefore important to close this multi-layered gender-data gap. Aligning with this view, the present study aims to contribute to the body of feminist research by using quantitative methods to expose potential underlying, oppressional structures about the stigma of menstruation.

Revealing power structures that are salient in women's realities is also aligning with critical menstruation studies, which has been introduced in the theory chapter. Critical menstruation studies has a transdisciplinary self-understanding and uses a wide variety of methodological approaches, including quantitative methods (Bobel, 2020). Therefore, the study can be seen as aligning with critical social science, feminist empiricism and critical menstruation studies.

While gender theories, which emphasis gender as a complex social construct instead of a binary category (Connell, 2013), is highly relevant for this study; the focus of this current study is narrowed down to only girls and boy. Therefore, the term gender has been and will be used when referring to theories or previous literature that have also used the term gender.

However, in the empirical part of this study the term sex will be used due to the binary query in the questionnaire.

4.2 Research design

This study was a cross-sectional, in-school survey. The survey was conducted in four secondary schools in February - March 2023 in Mwanza region, Tanzania. The survey used paper-based questionnaires that were self-completed by the students with a Kiswahili speaking assistant in the classroom.

4.3 Setting

In the following sections details of the study settings are provided. The geographical setting and characteristics of Tanzania and Mwanza will be presented as well as a description of the target population.

4.3.1 Geographical context

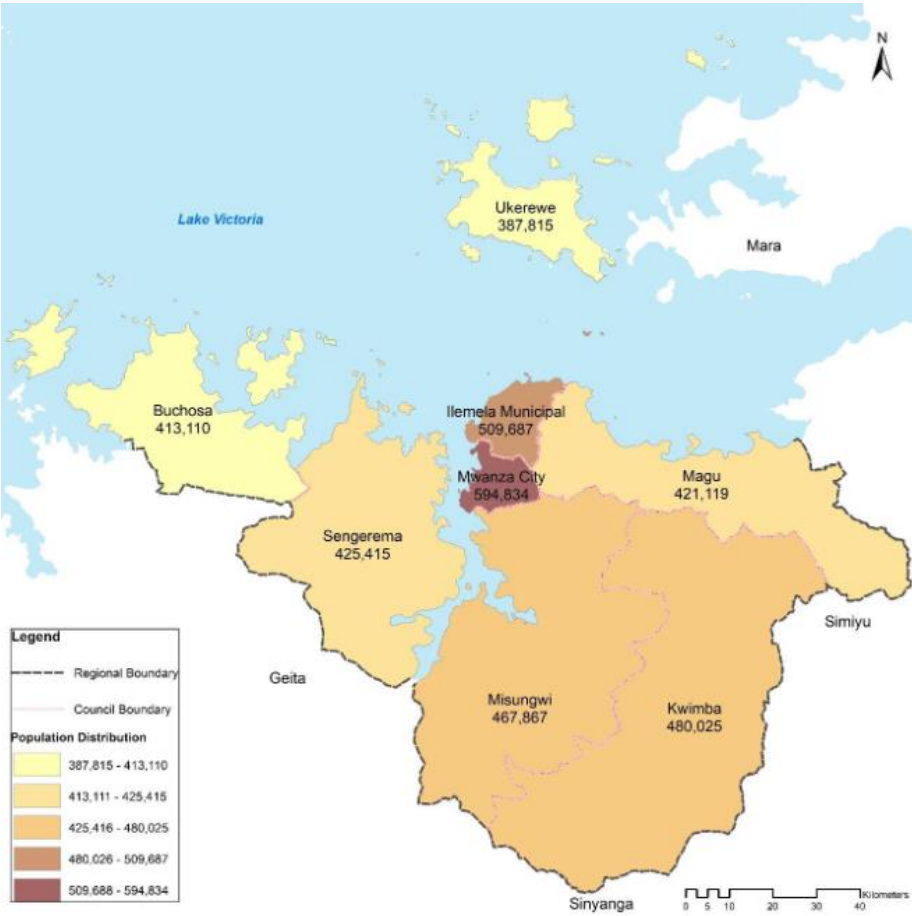
Tanzania is a country marked by poverty, ranked 160 of 191 in the most Human Development Index report (UNDP, 2022). Despite its colonial history and rich diversity of ethnic groups, Tanzania is known as a politically stable country with no presence of open conflicts between different ethnic groups. Some scholars state Tanzania as a remarkably harmonious country (Jakobsen, 2014). However, gender equality remains low as Tanzania belongs to the lowest scoring countries in the Women Empowerment Index (that accounts for life and good health, education and skill-building, labour and financial inclusion, participation in decision-making in the public sphere and freedom of violence (UNDP, 2023). Gender based violence is a pressing issue and the acceptance of domestic violence is quite high by men and women in Tanzania, as found in previous research (Jakobsen, 2014, 2018). Positions of power and ownership is unevenly distributed, and labour done by women is often poorly compensated or falls into unpaid care-work. In decisions about finances or family planning in the private sphere women find themselves dependent on men. Gender roles are demanding and persistent (D'Exelle & Ringdal, 2022; Jakobsen, 2018; Leavens et al., 2019; Tao, 2019). Schools are reported as challenging places for girls. Schoolgirls are exposed to the risk of abuse and harassment, a lack of academic attention, a negative narrative about their femininity and sexuality and insufficient facilities to handle their menstruation (Sommer, 2010b).

Mwanza region in north-western Tanzania is located at the south shore of Lake Viktoria. Mwanza is, after Dar es Salaam, the second largest urban settlement in Tanzania with 3.7 million inhabitants. Mwanza region has a recent history of mining and therefore played a relevant economical role for Tanzania and for international cooperations (Fisher et al. 2009). An airport connects Mwanza with domestic destinations and Kenya. The access to the lake facilitates economic and individual transport within the lake zone. Two districts of Mwanza region were chosen for this study, one that is considered urban (Ilemela) and one that is considered rural (Misungwi). Mwanza city and Ilemela municipality, forming the urban part of the region, host 1.1 million people together with an average household size of 4 persons. In Misungwi district live 560000 people with an average household size of 5.9. While retail paints the scenery of the urban district Ilemela, the vast majority of people in Misungwi are involved in cattle-keeping and subsistence farming as major economic activities (Boniphace et al., 2021; Natai et al., 2020). The majority of the population in Mwanza region belongs to the ethnic group Sukuma (Boniphace et al., 2021; D'Exelle & Ringdal, 2022).

The population distribution of Mwanza region is presented in figure 3 underlining the contrast of the rural Misungwi district and the urban Ilemela district in their density of population. The graphics and the population data are extracted from the 2022 population and housing census of Tanzania.

Figure 3

Population distribution by council for Mwanza region in total numbers



Note. The colours reflect the number of inhabitants, while dark colouring corresponds to a high number of inhabitants. Mwanza city and Ilemela municipality can be considered together as the urban part of the Mwanza region. Adjacent to the south is the rural district of Misungwi with a lower population density. The 2022 Population and Housing Census: Administrative Units Population Distribution Report; Tanzania Mainland. Copyright 2022 by The United Republic of Tanzania (URT), Ministry of Finance and Planning, Tanzania National Bureau of Statistics and President’s Office - Finance and Planning, Office of the Chief Government Statistician Zanzibar.

4.3.2 Target population

The study aimed for girls and boys in the age range 14 to 17. According to the Tanzanian grade system this age range corresponds most with form two and form three in secondary school. This age group was chosen due to the salience of menarche (Whitworth et al., 2023), puberty and the relevance of the school environment and educational settings, being a critical time for the further educational trajectory.

An even choice of rural and urban schools aimed to portray a more representative picture of the experiences of students in Tanzania, as the setting can be different in terms of cultural context, socio-economic circumstances, and school infrastructure. It was decided to conduct the study in public schools to capture the experience of the broad majority instead of a smaller well-off population that has access to private schools³. The reason for including boys and girls in the sample has been discussed in the rationale (section 3.7).

4.4 Sampling strategy

The sampling of the study aimed for highest possible scientific standards whilst being feasible in facilitation for a master thesis. In the following sections the consideration about the sampling, its planning and the realisation of the strategy is presented.

4.4.1. Planning and reasoning

The sampling strategy of the study was a mixed strategy. The region was chosen due to interest of the researcher (purposive sampling). The two districts were chosen to represent the rural and the urban context (purposive) whilst still being in accessible reach for the research team. Schools were sampled randomly (see section 4.4.2 for details). Selecting form two and three was a purposive choice due to the age group of interest. The actual participating streams were planned to be randomly sampled. All students belonging to the selected classes were invited to participate. The sampling plan is displayed in figure 4 and shows the different levels of sampling.

Schools are considered as clusters. Therefore, the last steps of the sampling plan followed a one-stage cluster sampling (Henry, 1990). This means choosing a cluster (school), randomly selecting a portion of it (streams that were in the respective form) and include all people belonging to this sub-group. Clusters also imply special consideration in data-handling, such as intra-class correlations. The purpose of an intra-class correlation analysis is to test if the responses of participants are independent of the common context of the cluster.

³ None of the schools was sponsored by a religious institution nor had a religious profile, which is the case for all public schools in Tanzania.

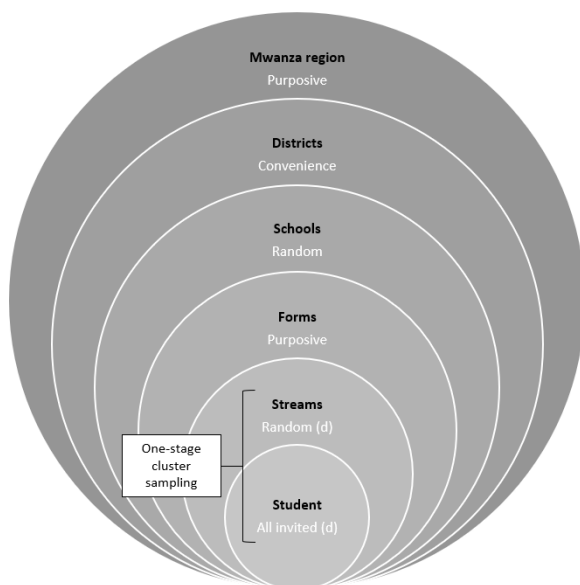
There were circumstances that required to deviate from the sampling strategy, which is visible with a d in figure 4 and is explained in the following text describing the practical realisation of the sampling strategy.

4.4.2 Realisation

The study aimed to recruit students enrolled in secondary, public day-schools with a mixed gender student population of 800-1500 students per school. After obtaining a list of all schools of the authorities in the respective district, schools that did not meet the criteria were excluded and the remaining schools were randomly sampled using SPSS (IBM Corp, 2021) to select two schools in Illemela district and two schools in Misungwi district. The large size of the schools allowed a random sampling of the streams per form as well. This was planned by using a list of all classes in form two and form three, obtained from the principals of the schools, and doing a manual lottery. However, this was only possible in the first school. In the following schools the organisational circumstances did not allow a lottery and the headteacher or academic leader of the day assigned classes that did not have teacher-led lessons at the time of visiting. All students belonging to that selected streams of form two and form three in the schools, were invited to participate in the study. In one class the number of students was higher than communicated by the administrative office, thus the number of students exceeded the prepared material. A random exclusion of ten students had to be done due to the limited material.

Figure 4

Sampling strategy



Note. The d in brackets indicates a deviation of the planned strategy due to circumstances as explained in the text above. Own work.

4.4.3. Sample size calculation

A power analysis was performed to calculate the optimal sample size for the study. This is a common practice for deductive research to determine what sample size is needed for the detection of statistically significant effects for particular analyses. In case of a too small sample size, a type 2 error could occur, meaning that existing effects would not be detectable due to low statistical power (Pallant, 2020). The calculator of Soper (2023) was used for this purpose.

Before the study, the sample size calculation was conducted based on a Fisher-Z-value test (that was the most complex planned analysis in the study)⁴. However, after data collection the decision was made to work with latent variables. Therefore, a post-hoc power analysis

⁴The original a-priori analyses for a Fisher-Z-value test resulted in a necessary sample size of 438 ($\alpha = .05$, power = .80, allocation rate = 1 effect size = .27, two-tailed).

based on structural equation modelling (SEM) was conducted. The analysis based on a SEM resulted in a required sample size of 476 (number of latent variables = 3, number of indicators = 22, $\alpha = .05$, power = .80, effect size = .16). The parameters aligned with scientific standards (Pallant, 2020).

4.5 Study variables and measurements

This study used established scales⁵ from published studies (Benshaul-Tolonen et al., 2020; Cadamuro et al., 2022; Marván et al., 2006) to measure the study variables. Followingly, the variables and their measurements are presented.

4.5.1 Socio-demographic variables

The socio-demographic variables included age (only month and year, to ensure anonymity), sex, grade, housing arrangement and a question if the participants have experienced their menarche already (if female). The number of questions regarding socio-demographic information was kept low in order to reduce the time needed to complete the questionnaire, as it occupied the student's education time.

4.5.2 Independent variables

4.5.2.1 Social dominance orientation. The SDO scale consists of two factors⁶: anti-egalitarianism (SDO-E) and dominance (SDO-D). SDO-E captures "a preference for systems of group-based inequality that are maintained by an interrelated network of subtle hierarchy-enhancing ideologies and social policies" (Ho et al. 2015, p. 2). While SDO-E is more subtle, SDO-D confirms the support for an active and forceful oppression of the low-status group by the high-status group (Ho et al. 2015).

The scale has been used widely in many different contexts measuring all types of intergroup relations and conflicts and is well established in quantitative research in social psychology (Pratto et al., 2006). The history of developing and improving the SDO scale often resulted in longer and shorter version of it (Ho et al., 2015). This was also the case in a study that validated the SDO scale for children (Cadamuro et al., 2022). They tested a long version

⁵ The term measurement and scale are used interchangeably.

⁶ The term dimension and factor are used interchangeably.

(16 items) and short version (10 items) and the dominance and anti-egalitarianism dimension of each scale in an age group that was slightly younger than the target group of this study (fourth and fifth graders, in Italy). All 16 items were adopted for this study which enabled thorough investigations of the different versions of the scales and their applicability in the study context. An example of a SDO-D item (D8) is: “*Should some groups of people be forbidden from doing what they want?*”. One item (D9) of the SDO-E dimension is: “*Should all groups be able to do the same things?*”.

As a primer to this scale, the participants were asked to think about women and men while answering the questions to ensure that gender equality was measured particularly, rather than for example classism or racism. Again, previous studies successfully applied a prime with the SDO scale to create salience for certain groups (Pratto et al., 2006).

4.5.2.1 Knowledge. Based on the scope of this study and recent discussion about menstrual health literacy (see section 2.6) (Bobel, 2019; Olson et al., 2022), the scale for menstruation knowledge in this study captured understanding of the biological process menstruation and its meaning. The questions addressed what happens, when, how often, and what the period signals. It was adopted from a study that was conducted in a similar theoretical context and local setting with boys and girls (Benshaul-Tolonen et al., 2020). However, only 7 of the 12 items were selected. The exclusion of the rest was due to several reasons. Some of the items used quite advanced biological terms⁷, while others seemed irrelevant for the age group. One exemplar item of the scale was (K4): *Menstrual periods indicates a woman is not pregnant.*

4.5.3 Dependent variable

4.5.3.1 Attitude towards menstruation. In this study the attitude towards menstruation is interest in a socio-cultural sense. The focus is set on social norms and stigma that exists around menstruation and how they can be linked to other constructs. For those reasons, the *secrecy* dimension of the beliefs and attitude towards menstruation scale (BATM)

⁷ Excluded questions used terms like endometrium or asked for the age of menopause, which varies tremendously and is therefore difficult to verify as correct or incorrect answers and is hardly tangent for the age group.

developed and validated by Marván et al. (2006) was suitable. The dimension *secrecy* consists of 12 statements about appropriate behaviour of menstruating girls and also covers the domain of “talking about menstruation”. The formulations are often posed in such a way that the presence of a man plays a role in the specific behaviour and sometimes they are posed more general. Additional to the conceptual fit of this extracted *secrecy* dimension with the study’s objective, a good reliability (Cronbach’s $\alpha = .79$) justified the extraction methodologically. An example item (M6) is: “*It is important that nobody knows when a woman is having her period*”. Marván et al. (2006) had a separate questionnaire for female and male participants, which had slightly different formulations for two items (item M5 and item M8). For practicability of translation and data collection, they were made more universal for this study by minor wording changes⁸, so that only one questionnaire was distributed for all participants regardless of their sex. As only the *secrecy* dimension of the BATM scale was used, it is referred to in the further text as BATM-S.

4.6 Questionnaire design

The questionnaire was divided in four sections with separate headers in the following order: *Opinion about menstruation* (BATM-S), *facts about menstruation* (knowledge about menstruation), *opinions about groups* (SDO), *questions about yourself* (socio-demographic variables). Additionally, were students asked to tick a number on the top of the questionnaire which helped to identify the in the data analysis. This order was chosen because the knowledge section had various answer formats whereas BATM-S and SDO had only Likert-Scales as response formats. Inserting the knowledge section between BATM-S and SDO was anticipated to prevent fatigue from answering many consecutive questions in a Likert-scale format. For this reason, no randomisation of blocks was used. Items were also not randomised due to limiting features of the software used to design the questionnaire (papersurvey.io, 2023).

⁸M5: It is uncomfortable to talk about the period (Original: “It is uncomfortable for us women to talk about our periods / It is uncomfortable for men to talk about the period” (Marván et al., 2020, p.461)).
M8: People feel uncomfortable when they see an advertisement about sanitary pads when in company with the other gender (Original: “Women blush when we see an advertisement about sanitary pads when we are with a man / Men blush when we see an advertisement about sanitary pads when we are with a woman” (Marván et al., 2020, p.461)).

The socio-demographic information used single-choice questions and open answers for the age. Single-choice questions were also used for the knowledge sections including either different answer options or *yes/no/I do not know*. The SDO and BATM-S used a six-point Likert-scale (1= *strongly disagree* to 6 = *strongly agree*). A six-point Likert-scale was an adjustment for the BATM-S and SDO scale that both originally had a five-point Likert scale answer format (Cadamuro et al., 2022; Marván et al., 2006). This adjustment was made to avoid a moderacy bias (Bogner & Landrock, 2016) and is justified by the shame attributed topic of menstruation that could be even more tempting to response with the indifferent option. To make it more understandable for the young participants, symbols (- and +) accompanied all Likert-Scales to illustrate the degree of support for the statement. Reverse phrased items were included in the scales and handled accordingly.

All the scales were originally in English and got translated into Kiswahili, with the help of a local collaborator, using back-translation. The questionnaire in English and Kiswahili can be found in the appendix.

4.7 Data collection procedure

To obtain consent of the headteacher for conducting the surveys, a meeting was scheduled in advance. If the availability of the headteacher did not allow that, it was done prior to the data collection itself on the same day. After explaining the study and signing the consent form, the random sampling was conducted or the staff led directly to the classes that were available and introduced the team to the children (further explained in section 4.4.2). Afterwards, the research team, consisting of me, the master student, and the Kiswahili speaking assistant, started the session. After a short introduction of ourselves, including some opening words about the objective and interest of the study, an emphasize was placed on the opportunity to ask questions anytime throughout the survey. It was stressed that the study is voluntary for the students, and that this is not “school” in the classical sense, so there would be no grading and that they are entitled to their opinion and there are no right or wrong opinions. Afterwards, the information sheet, the assent form and a pen were handed out to each student to fill out the form and the questionnaire. The assistant read out the information and asked for remaining questions. Then the students were explained how to sign the assent form. Students who did not assent left the classrooms. All students who assented stayed, the

assent form was collected by the team and the questionnaire were distributed. The questionnaires had an individual but randomised code. Afterwards the assistant explained how to reply to the items and how to correct the reply if needed.

After reading out the information of the first section the students started filling out the items independently until the end of that section. The students were asked to wait after each section of questions, as each new block was introduced by the assistant.

In the session with the first class, it took longer than anticipated until all students were finished with each section. No comprehension questions were expressed by the students after providing the option to ask multiple times throughout the completion. Still, the assistant increased her support in the following sessions, with the assumption that this could solve a possible difficulty in understanding the items. In the following session each question or item was read out by the assistant, the different degrees on the Likert-scale and its meaning to these respective questions were explained. Afterwards, the students received time to select a reply-option before continuation with the explanation of the next question. Moreover, items which included more advanced terms (for example the words: *inferior* and *dictate* for the SDO scale or *ovulation* for the knowledge scale), were further explained. However, comparative analyses did not show a significant effect for the increase of support in the following sessions. Therefore, it was a non-impactful alteration or manipulation, but students were maximally informed about the questions, which served the ethical standards of the study. All classes were included in the data analysis.

After completing the whole questionnaire, the students got asked to check if they have missed questions and the questionnaires were collected by the team. The students got their compensation and were thanked for their participation. The whole session took approximately one hour per class.

4.8 Data handling and analysis

This chapter describes the steps after the data collection. This encompasses the strategy and tools used for the management, preparation and analysis of the collected data.

4.8.1 Data management

The questionnaire was designed with optimal mark recognition technology. The software that was used is called *papersurvey.io* (2023). Post data collection the answer sheets were scanned and fed into the *papersurvey.io* software which created a datasheet. The datasheets were then imported into the analysis software programmes. *SPSS version 28.0* (IBM Corp, 2021), *R-studio version 4.3.2* (R Core Team, 2023) and the *a-priori sample size calculator for structural equation models* of Soper (2023) was used for the analyses. The assent and consent forms were scanned independently and stripped from the questionnaires. During the whole digitalisation progress the protection of the (anonymous) data had the highest priority. It was saved on password-protected devices and servers (SAFE-server of the University of Bergen). The paper copies are stored at the Mwanza Intervention Trial Unit research institute in a locked storage.

4.8.2 Data preparation

4.8.2.1. Variable preparation. All the variables received codes and sum-scores were created for BATM-S and SDO and its factors using SPSS (IBM Corp, 2021). Reversed items were handled accordingly. Knowledge was coded as a score with equal weight for each of the seven items. A higher score indicated a higher level of knowledge. Each correct item was assigned one point, while both - an incorrect answer and replying *I do not know* - was coded as zero. The codebook can be found in the appendix.

4.8.2.2 Handling of missing and invalid data. There was a small amount (lower than 5%) of missing and invalid data. First, all missing or invalid values were investigated in the single answer-sheets and corrected, if possible, which mainly concerned the age in cases the software struggled identifying the hand-written numbers. The remaining missing or invalid data on all sets of questions was defined through SPSS (IBM Corp, 2021) with the codes (-97), (.). In six cases the whole last page of the answer sheets was missing, which encompassed questions about the sex, menarche, and living conditions. Those cases were excluded from the sample the proportional amount of missing data for each of those cases was too high by missing a full page. One more case was excluded due to missing data on age.

4.8.2.3 Outliers. Outliers of the different variables were checked and found to be negligible because high or low values for SDO and BATM-S expresses opinion and there is

nothing to suggest that these values are not valid. The reverse-coded items also eradicated the risk of anchor biases as the reason for high or low sum scores outliers (Weijters & Baumgartner, 2012). Another examination of outliers was done using Cook's distance for SDO and BATM-S. The scatterplot looked reasonably distributed and the few cases with high values of Cook's distance were examined more thoroughly, which did not suggest any measurement errors or other reasonable aspects to exclude those cases.

Extremely low outliers in the age section were due to the already mentioned handwriting recognition errors in the software and got corrected manually. However, the age range as such happened to be bigger than expected (11.33 to 21.17). Originally the targeted age range was 14 to 17. After careful theoretical and context-specific consideration, the included age range for the study was expanded to 13 to 19. Firstly, even though some students are older or younger, they still go in the same class and can be considered as peers. In the secondary school system in Tanzania, classes are age-diverse, and promotion is based on academic performance rather than age. The decision to cut the students (N = 2) who are older than 19 is based on the official definition of adolescence by the World Health Organization (2019), stating adolescence as the age between 10 to 19 years. The exclusion of the young participants below the age of 13 (N = 6) was because they rarely reported any experience with menstruation in the data. Furthermore, observing values in the variables of the participants below 13 showed extreme values, which could be an indicator that the topics were not relatable or understandable for them. For the menstruation-related part, this is consistent with the available evidence on age of menarche in Tanzania, being 13 to 16 years⁹ (Whitworth et al., 2023). Therefore, the age range of the main sample got defined from 13 to 19 years old. The age section of the descriptive results includes a presentation of the values of the main and initial sample, all other sections refer to the main sample.

4.8.3 Data analysis

The distribution of the data for the main variables got checked for violations of assumptions to perform further analyses (normality, linearity and homoscedasticity,

⁹ Cited from a study conducted in the urban context in Tanzania. There is evidence from other sub-saharan countries, that the menarche is later in rural areas than in urban areas; assumingly due to nutritional factors (Odongkara Mpora et al., 2014).

independency of residuals, independency of groups, variance homogeneity). Descriptive analyses were performed for the main variables, SDO, BATM-S and knowledge as well as for the relevant socio-demographic questions. Those preliminary analyses were conducted with SPSS (IBM Corp, 2021) while the consecutive analysis were performed with R Studio (R Core Team, 2023).

To address the research questions the analyses followed a two-step format. First, the measurements of the variables of SDO and BATM-S were assessed. This was done by a reliability analysis for internal consistency using Cronbach's alpha. Further, a confirmatory factor analysis (CFA) was performed for each of the two variables and their dimensions respectively. A CFA investigates the construct validity of the measurements as well as the structure of the measurements. The procedure results in a measurement model also called a latent variable. The knowledge score was not suitable to assess by a reliability analysis or CFA because of the answer format, therefore detailed results of the descriptive analysis were reported.

A CFA is not only an elaborate way to examine measurements but also a preliminary step for a structural equation modelling (SEM), in which the latent variables are set into relation with each other in a path-model of regressions¹⁰. Therefore, a preliminary CFA with a consecutive SEM serves the research objective well which encompasses a detailed assessment of the scales (research question one) and a consecutive investigation of the relationships between the variables (research question two and three) in model. For research question four, a multi-group analysis was used¹¹, which introduced sex as a grouping variable to the SEM. In this method there is a base model in which all parameters can vary freely between the two sexes. The next model constrains for sex and the two models are tested against each other for significant difference by an ANOVA. If there is a significant difference, it can be assumed that there is a variation based on sex in the overall model. In further testing, models are defined where sex is constrained paths-wise and each of those models are tested

¹⁰ The method of estimation used for the regressions was maximum likelihood.

¹¹ The method used for the multi-group analysis was global estimation.

against the base model. The purpose of this separate testing is to determine if the strength of a certain path in the model differs between girls and boys.

4.9 Quality assurance

To capture variables, a measurement is needed in the form of a scale, according to this study design. Punch (2014) states that existing scales of “central variable[s] in a research area” (p. 236) are to be preferred over developing a new measure in most cases. The usage of existing scales enables to compare results better and it produces more detailed knowledge about the properties of the variable itself (Punch, 2014). Furthermore, it is efficient as developing a measurement of high quality involves many steps and thorough considerations. BATM-S as well as SDO can be seen as central variables in their research area (Cadamuro et al., 2022; Eyring et al., 2023; Marván et al., 2006; Pratto et al., 2006). However, when choosing an existing measurement, the psychometric values should be investigated in the literature. All relevant values that were provided by the authors of the original studies are reported in the following sections. Finally, it is important to consider the target group and the setting of the study, to make sure the fit of the measurement is as adequate as possible whilst aiming for generalisability. Those evaluations were carefully considered when selecting the measurements.

The knowledge variable is measured as a score and not a classical scale like BATM-S and SDO, which therefore does not provide estimates such as reliability coefficients. Therefore, the assessment of the quality and applicability in the selection process was based on context applicability (the knowledge score was developed in Tanzania) (Benshaul-Tolonen et al., 2020) and perceived relevance and understandability of the questions for the target group, in consultation of local collaborators, who were experienced with similar target groups.

4.9.1 Reliability

Reliability in the form of internal consistency, indicates whether the items of a scale “hang together” and measure the same construct (Yilmaz, 2013). Cronbach’s α is a standardized parameter for the internal consistency and considered as acceptable with values $\geq .70$ (Cronbach, 1951; Pallant, 2020)). The study variables, SDO and BATM-S were measured with established scales. The extracted secrecy factor of BATM hand an alpha value of $\alpha = .79$ (respectively $.82$ in another sample) in the original literature (Marván et al., 2006). The

reliability of the overall short and long scale of SDO was not reported but for each factor within the long (16 items, 8 per factor) and short scale (10 items, 5 per factor). The SDO-D factor had a reliability of $\alpha = .73$ in the long scale and $\alpha = .71$ for the short scale (5 items), respectively. The SDO-E factor showed a reliability of $\alpha = .82$ for the long scale and $\alpha = .71$ for the long scale (Cadamuro et al., 2022).

To conclude, all of the reliability values met the standardised convention (Pallant, 2020), justifying the choice of using them in the current study. However, a reliability analysis of the scales based on the data at hand will be performed. The results are reported later in the text (section 5.1.1.).

4.9.2 Validity

While reliability measures the consistency of the measurement, validity refers to the accuracy. Construct-validity is concerned with whether a measurement actually measures what it is supposed to be (Yilmaz, 2013). It can be, amongst other methods, assessed by a CFA. A CFA confirms underlying structures, such as factors, in variables what is then referred to as latent variables. Further, a CFA reveals shows how well the data fits these latent variables. CFA is theory-driven and confirmatory which means that already defined factors by theory within the variable are tested with hypotheses about variances. More specifically, CFA shows how much variance of the item is explained by those latent factors of a variable, what amount of variance is caused by the uniqueness of the single items and what degree of the variance is random error. However, the random error can be unravelled further through CFA by inter-correlations of items that might correlate strongly due to similar wording or measurement effects for instance (Kline, 2023).

The respective values given by the CFA have certain cut-off values that are discussed in scholarship. For the comparative fit index (CFI) and the Tucker Lewis Index (TLI) some researchers suggest $> .95$ as acceptable (Hu & Bentler, 1999), while others consider and practice $> .90$ as an adequate fit (Eyring et al., 2023). The root mean square error of approximation (RMSEA) is considered an acceptable fit when $< .08$ and considered a good fit when $< .05$. A significant χ^2 indicates a poor fit. However with sample sizes larger than 200, χ^2 usually shows significance, which limited the informative value of the χ^2 estimate in this study (Kyriazos, 2018). CFA was conducted with SDO and BATM-S in this study.

No CFA has been done yet for BATM-S in previous studies, only a principal component factor analysis resulting in the different factors, like the *secrecy* factor (Marván et al., 2006). However, a CFA for BATM-S was done in the current study (5.1.2)

The CFA conducted in the original study of the SDO children scale showed that the two factor models for the long and short scale had better results than the one factor model (Cadamuro et al., 2022). These results from Cadamuro et al. (2022) confirm the two-factor structure of SDO, which has been found other previous research as well (Ho et al., 2015). The results of the CFA for the two-factor model of the long version was: $\chi^2(103) = 191.39$, $p < .001$, Comparative Fit Index (CFI) = .909, Tucker-Lewis Index (TLI) = .894, RMSEA = .056. For the two-factor model of the short version the CFA showed: $\chi^2(34) = 70.23$, $p < .01$, CFI = .949, TLI = .933 (Cadamuro et al., 2022). The two-factor model of the short version of the scale showed better results in that study. In this current study a CFA was performed for the different versions (long, short and the respective factors) (see section 5.1.2).

4.9.3 Generalisability

Generalisability is an interesting aspect of this study. Except for the knowledge and socio-demographic variables (Benshaul-Tolonen et al., 2020) that have already applied in the same and neighbouring regions, the scales of the study variables were tested in other regions of the world. In Italy, among children belonging to the majority society and the migrant community (SDO) (Cadamuro et al., 2022), and among undergraduates with different levels of education in Mexico and the United States (BATM-S) (Marván et al., 2006). This particular setting of Mwanza region, Tanzania is a new area in which these measurements are used and therefore contributes to the question of generalizability of the measurements.

Schools in both rural and urban context were chosen and stages of random sampling were applied in the sampling strategy to enhance representativity and generalisability of this current study. However, Tanzania is a diverse country with a diverse school system and a broad generalization from the roughly 500 participants in this study to the entire student body in Tanzania cannot be made (Henry, 1990; Punch, 2014). However, the study is designed to be replicable. Therefore, future replications could contribute to the generalizability in the investigation of the influence of patriarchal attitudes on attitudes toward menstruation with these measurements, in Tanzania and beyond.

4.10 Ethical considerations

An ethical clearance was obtained by the National Institute for Medical Research Tanzania in November 2022, followed by a research permit of the Tanzanian Commission for Science and Technology in January 2023. Permission was also obtained by the Regional Administrative and Local Government Authorities of Mwanza Region followed by the Municipal Director's office of Ilemela and District Executive Director's office of Misungwi. The project was also registered at RETTE from the University of Bergen. An application for a clearance from the Norwegian centre for research data (Norsk Senter for Forskningsdata) was not necessary as there was no personal data included in the questionnaire (according to consultation with the data protection officer at the University of Bergen).

According to Tanzanian law, the principal of the school has the guardianship for the students while they are in school. Therefore, he or she can sign informed consent for the students, whilst the students themselves sign informed assent if they want to participate in the study. Both forms contained contact information of the local partners and the master students and their institutions. The information sheets and consent/assent forms were approved in the process of acquiring the permit from the National Institute for Medical Research Tanzania and the Tanzanian Commission for Science and Technology.

Survey with minors require a high degree of ethical consideration and integrity. The questionnaire did not contain sensitive questions or harmful content for adolescent students. It also did not ask for personal or sensitive information. In addition, the questionnaire was designed to be as time efficient as possible. Still, students did allocate their valuable schooling time to participate in the survey. As an appreciation for their given time did they receive a compensation after the data collection was completed. The selection of the items was based on advice from the local partners (pencils, pens and notebooks). The design of the questionnaire followed the advice of the local assistant who is experienced working with that age group in the region. In order to achieve a high level of cultural appropriateness and to improve the study in quality, the local assistant and host was consulted while designing and planning the study as well.

V Results

In this section the results of the data analysis are presented. For reiteration the research questions of the study are presented here.

Research question one: To what extent can the selected scales– beliefs and attitude towards menstruation (secrecy dimension), social dominance orientation and knowledge about menstruation –be applied in the context of secondary schools in Mwanza, Tanzania?

Research question two: To what extent is there a relationship between social dominance orientation and attitude towards menstruation?

Research question three: To what extent are social dominance orientation and menstruation knowledge associated with attitude towards menstruation?

Research question four: Is there a significant difference by sex in the association between social dominance orientation, knowledge about menstruation and attitude towards menstruation?

The results chapter follows the order of the research questions. First, the results of the detailed examination of the study variables and their reliability and validity (research question one) will be reported, followed by the descriptive results of the study variables. Consecutively, the results of the investigation of the relationship between SDO and BATM-S (research question two) will be presented, followed by the results of introducing knowledge to the model as the second independent variable (research question three). Finally, the results of the multigroup analysis will be reported, which investigated whether the strengths of the relationships between the variables differ by sex (research question four).

5.1 Scales

The results of the preliminary analyses and the descriptive analyses for BATM-S, SDO and knowledge are elaboratively described in order to contribute to the evidence about the measurements itself and its applicability in different contexts and target populations. These analyses and reports address research question one: *To what extent can the selected scales– beliefs and attitude towards menstruation (secrecy dimension), social dominance orientation*

and knowledge about menstruation – be applied in the context of secondary schools in Mwanza, Tanzania? Further the detailed results about the scales make the decision process about possible extractions or adjustments of the scales for further analysis, based on the data, more comprehensible.

5.1.1 Reliability analysis

5.1.1.1. BATM-S. The reliability for the BATM-S scale was $\alpha = .67$ (N of items = 12). However, the inter-item correlations showed noticeable low correlations of item M8 (*People feel uncomfortable when they see an advertisement about sanitary pads when being in company with other gender*) with all the other items. This was also represented in an increased ‘ α if item deleted’ of .68. All other items did not show a higher value by deletion. The reliability did not reach the standardised acceptable level of $\geq .70$ (Cronbach, 1951; Pallant, 2020) but was close enough to justify the procession with the scale in this study.

5.1.1.2 SDO. As mentioned previously, the theoretical development and empirical validation of the SDO scale has often led to short and long versions and optionally the extraction of a single factor (Cadamuro et al., 2022; Ho et al., 2015). For this study, data was collected using the complete long version of the SDO scale for children with its two factors and 16 items to assess the applicability and structures of the measurement that has not been applied in this context yet (Cadamuro et al., 2022). Further, using all 16 items enabled a detailed examination of the different versions and provided the option to extract one version based on empirical and theoretical reasoning. For simplified reading, the individual scale versions are introduced in table 1 with their abbreviations used in the results chapter and characteristics (the formulated items can be found in table 6 where the factor loadings are presented).

Table 1*The different versions of the SDO scale*

Abbreviation	Scope	Factors	N of items
SDO _{long}	Complete scale	Dominance and anti-egalitarianism	16 (8 per factor)
SDO-D _{long}	One factor of the long scale	Dominance	8
SDO-E _{long}	One factor of the long scale	Anti-egalitarianism	8
SDO _{short}	Complete shortened scale	Dominance and Anti-egalitarianism	10 (5 per factor)
SDO-D _{short}	One factor of the short scale	Dominance	5
SDO-E _{short}	One factor of the short scale	anti-egalitarianism	5

In this current study SDO_{long} showed a low reliability of $\alpha = .40$ (N of items = 16), while SDO-D_{long} showed a lower reliability with $\alpha = .27$. In turn, SDO-E_{long} showed a higher reliability with $\alpha = .53$.

For SDO_{short} the reliability was $\alpha = .44$, which is higher compared to the long complete version (SDO_{long}, $\alpha = .40$). The factors of the short scale were also examined. SDO-D_{short} showed a reliability of $\alpha = .17$. A higher reliability could be found for SDO-E_{short} with $\alpha = .60$, which is the highest reliability that could be found within the SDO variable in this sample. All values are displayed in table 2.

Table 2*Reliability (Cronbach's α) for the SDO scales and dimensions*

Scales	Complete long scale	SDO-D factor long scale	SDO-E factor long scale	Complete short scale	SDO-D factor short scale	SDO-E factor short scale
Cronbach's α	.40	.27	.53	.44	.17	.60

Note. The long scale had 16 items, 8 items per factor. The short scale had 10 items, 5 items per factor.

5.1.2 Confirmatory factor analysis

A CFA was performed for each of SDO and BATM-S. Results lead to an adjustment in the model of BATM-S and the extraction of SDO-E dimension of the short scale.

5.1.2.1 Confirmatory factor analysis BATM-S. Since BATM-S represents one factor of the total BATM scale (Marván et al., 2006), it was treated as a one-factor model in the CFA. The initial measurement model showed inadequate goodness-of-fit measure of χ^2 (54) = 163.09 ($p < .001$), CFI = .793, RMSEA = .065, TLI = .747. A closer look into the data showed high modification indices between the items M1 and M2, M2 and M11 (modification indices of >20 for M1-M2 and M2-M11). High modification indices indicate that the fit of the model to the data would improve to a relevant extent by reducing a parameter restriction that is set to the model by default. In this case the modification indices showed a covariance of observed variables (items), which is by default set to zero by the model. By omitting this restriction for the particular items, the model would fit the data more accurately. However, even though data shows high modification indices, adjustments need to be based on theory or measurement consideration for the sake of credibility (Kline, 2023). The three items with high modification indices were the three reversed items of the BATM-S scale. Reversed items often show statistical discrepancies in scale analyses that can be attributed to many reasons (Weijters & Baumgartner, 2012); one possible reason in this case was that the con-trait phrasing influenced the understandability or agreeability for the participants. The connection between the reversed items was also reflected in the inter-item correlation in the reliability analysis that showed high correlation among these three items. The found connection between the three items and corresponding considerations about the phrasing can be classified as a measurement effect, which justified modification (Kline, 2023). The alternative model of measurement was therefore modified by allowing the items M1, M2, and M11 to correlate, which led to the following acceptable fit: χ^2 (51) = 99.32 ($p < .001$), CFI = .908, TLI = .881, RMSEA = .044. While acknowledging that the estimates of the alternative model were not ideal, the alternative model was substantially better than the initial model ($\Delta\chi^2 = 63.78$,

$p < .001$).¹² Therefore, the alternative model (which was less restrictive) was used in further analyses. The estimates of the initial and alternative model are displayed in table 3 below, followed by table 4, showing the standardized factor loadings of both models. As seen in table 4, the factor loading of M8 (*People feel uncomfortable when they see an advertisement about sanitary pads when being in company with the other gender*) is quite low (.171 in the alternative model), which ties in with the low inter-item correlation of that item (reported in 5.1.1). Nevertheless, the item was kept in the scale for comparability with existing literature and was justified by the acceptable global fit of the CFA. However, possible reasons for the low factor loading are presented in the discussion section.

Table 3

Goodness-of-fit estimates of the initial and alternative one-factor model of BATM-S provided by a CFA

Model	χ^2 (df)	p	CFI	TLI	RMSEA	$\Delta \chi^2$
Initial model	163.09 (54)	.000***	.793	.747	.065	
Alternative model	99.32 (51)	.000***	.908	.881	.044	
						63.78***

*Note. CFI = comparative fit index, TLI = Tucker Lewis Index. RMSEA = Root mean square error of approximation, Significance levels are indicated by *** $p < .001$.*

¹² Further adjustments to reduce the restrictiveness of the model could not be justified theoretically or methodologically. Acceptable values for the measurement model, whilst complying to credible scientific practice was seen as a well taken compromise.

Table 4

Standardised factor loadings of the CFA for the one-factor model of BATM-S, initial and alternative model

Item	Initial model	Alternative model
M1: It is important that women talk about the menstrual period with men.	.481	.379
M2: It is important to discuss the topic of the period at school with boys and girls together.	.462	.334
M3: Women must hide anything that shows that they are having their periods.	.391	.435
M4: It is important that women buy sanitary pads without being seen.	.334	.362
M5: It is uncomfortable to talk about the period.	.449	.435
M6: It is important that nobody knows when a woman is having her period.	.402	.436
M7: It is embarrassing when a man finds out that a woman is having her period.	.317	.368
M8: People feel uncomfortable when they see an advertisement about sanitary pads when being in company with the other gender.	.146	.171
M9: It is important to keep the period a secret.	.546	.569
M10: Women should avoid talking about their periods when there are men present.	.435	.436
M11: It is important to discuss the topic of the period at home openly.	.339	.239
M12: Women must stay away from men while they are having their periods.	.307	.315

Note. Standardized factor loadings of latent variables (one-factor) model.

5.1.2.2 Confirmatory factor analysis SDO. A CFA was conducted for the long and short scale of SDO as well as their respective factors (SDO_{long}, SDO-D_{long}, SDO-E_{long}, SDO_{short}, SDO-D_{short}, SDO-E_{short}). The two distinct factors (anti-egalitarianism and dominance), which are suggested in the literature (Cadamuro et al., 2022; Ho et al., 2015) could be confirmed in this

study as well through the CFA. The one-factor models for the complete scales (SDO_{long} and SDO_{short}) showed significantly lower fits than the two-factor models and are therefore not further considered in the report. The fit indices are shown in table 5 and the factor loadings in table 6, followed by an elaboration of the results and its implication for progression with the scale in this study.

Table 5

Goodness-of-fit estimates for the different scales of the SDO variable

Model	χ^2 (df)	p	CFI	TLI	RMSEA
SDO _{long}	202.01 (103)	.000	.826	.797	.045
SDO-D _{long}	28.50 (20)	.098	.954	.935	.030
SDO-E _{long}	49.54 (20)	.000	.904	.865	.055
SDO _{short}	73.68 (34)	.000	.890	.854	.049
SDO-D _{short}	7.149 (5)	.210	.971	.941	.030
SDO-E _{short}	8.04 (5)	.015	.987	.974	.035

Note. CFI = comparative fit index, TLI = Tucker Lewis Index. RMSEA = Root mean square error of approximation.

Table 6*Factor loadings of the CFA for the different scales of the SDO variable*

Item	Long version (16 items, 8 per factor)			Short version (10 items, 5 per factor)		
	SDO _{long} α = .40	SDO-E _{long} α = .53	SDO-D _{long} α = .27	SDO _{short} α = .44	SDO- E_{short} α = .60	SDO-D _{short} α = .17
D1: Should all people earn the same amount of money? (R)	.106	.127	--	--	--	--
D3: Would it be good if all groups were equal? (R)	.443	.476	--	.610	.441	--
D5: Would we have fewer problems if we treated people more fairly? (R)	.372	.369	--	--	--	--
D7: Should equality between groups be increased? (R)	.468	.474	--	.670	.469	--
D9: Should all groups be able to do the same things? (R)	.354	.349	--	-	.360	--
D10: Should no single group dictate in society? (R)	.062	.057	--	.673	--	--
D11: Should all groups be equal? (R)	.592	.593	--	.867	.613	--
D14: Should we find a way to make the conditions between groups equal? (R)	.604	.604	--	.703	.603	--
D2: Are some groups of people inferior to other groups?	.130	--	.094	.306	--	.143
D4: In getting what people want, is it sometimes necessary to use force?	-.094	--	-.100	-.237	--	-.134

Item	Long version (16 items, 8 per factor)			Short version (10 items, 5 per factor)		
	SDO _{long} $\alpha = .40$	SDO-E _{long} $\alpha = .53$	SDO-D _{long} $\alpha = .27$	SDO _{short} $\alpha = .44$	SDO-E_{short} $\alpha = .60$	SDO-D _{short} $\alpha = .17$
D6: Should some groups of people be kept in their place, in order to not create problems?	.052	--	.042	-	--	-.507
D8: Should some groups of people be forbidden from doing what they want?	.041	--	.027	-	--	--
D12: To get ahead in life, is it sometimes necessary 'to step' on other groups?	-.445	--	-.442	-.585	--	--
D13: Should inferior groups stay in their place?	-.375	--	-.375	-.466	--	-.451
D15: Is it fair that some groups are more worthy than others?	-.647	--	-.618	-.597	--	-.465
D16: Is it fair that some groups have more chances in life than others?	-.595	--	-.626	-	--	--

Note. Reversed items are indicated by (R) and were handled accordingly. The CFA for the complete scales followed a structure of a two-factor model as suggested in literature. The bold column (SDO-E, short version) indicates the scale that was extracted for further analysis.

To sum up, SDO-E_{short} showed the strongest values in the reliability analysis ($\alpha = .60$) and in the CFA (see table 4) including the factor loadings (see table 5) compared to the other versions of the scales. This justified the choice of proceeding empirically with SDO-E_{short}¹³, which will be referred to as SDO-E in the rest of the work. The corresponding consideration based

¹³Neither the reliability analysis nor the CFA produce a ranking that clearly identifies the most favourable scale. Instead, a rich and complex set of estimates is provided, which can even indicate different directions in various aspects of scale quality or suitability. The decision to select a equals therefore more an attempt to recognise a general global orientation from the many values and to make the decision based on this.

on theory and possible measurement effects will be further elaborated in the discussion chapter.

5.2 Descriptive results

The relevant study variables and its estimates of range, distribution and central tendency are presented in the following paragraphs. Where parameters of items have informed further progression with the scales, more detailed information is provided. The end of the chapter shows the results of testing the study variables for significant difference by sex.

5.2.1 Age

The initial sample consisted of 498 participants. The age ranged from 11.33 to 21.17 with $M = 16.00$ ($SD = 1.38$). After excluding cases older than 19 ($N = 2$) and younger than 13 ($N = 6$) (reasoning in 4.8.2.3), the final sample size was $N = 490$ with an average age of 16.04 ($SD = 1.29$).

5.2.2 Sex

The distribution of female and male participants in the final sample ($N = 490$) was as follows: 266 (54.3%) were female and 224 (45.7%) were male.

5.2.3 Rural and urban schools and grades

Rurality and urbanity were roughly evenly distributed in the sample ($N = 490$) with 252 (51.4%) students attending a rural school and 238 (48.6%) attending an urban school¹⁴. 258 students (52.7%) were enrolled in form two and 232 (47.3%) were enrolled in form three.

5.2.4 Social dominance orientation and menstruation attitude

The composite scores for menstruation attitude showed a mean of 3.07 ($SD = .86$), a median of 3.04 and a range from 1.00 up to 5.17 ($N = 482$). The 5% trimmed mean was 3.06. The estimates for kurtosis was $-.48$ and the skewness showed a value of $.17$ (see table 7). The positive skew showed that the respondents cluster slightly towards lower values (low secrecy). A negative kurtosis value indicated a rather flat curve, which means that there were many

¹⁴ While a comparison of rural and urban areas was not the focus of the study, main study variables (SDO-E, BATM-S and knowledge) were compared for differences in the rural and urban schools and no substantial difference could be found.

responses in the rather extreme area. However, it did not exceed any critical values and the histogram showed a reasonably shaped bell curve. Further, the sample size is far above 200 cases, which is yet another reason to not be concerned about the kurtosis (Tabachnick et al., 2007).

SDO was distributed in the sample as follows: the mean was 2.17 (SD = .93), the median 2.00, the values ranged from 1.00 to 5.80 and the 5% trimmed mean was 2.13 (N = 490). A positive skew of .87 showed a tendency towards negative values (low support for social hierarchies) and the kurtosis showed a peaked distribution with .56 (see table 7). However, the skewness and kurtosis were still within an acceptable range.

Table 7

Descriptive results for BATM-S and SDO-E

	N	M	SD	Min	Max	Skewness	Kurtosis
BATM-S	482	3.07	.86	1.00	5.17	.17	-.48
SDO-E	490	2.19	.93	1.00	5.80	.87	.56

Note. N = sample size, M = mean, SD = standard deviation, Min = minimum, Max = maximum.

For further analyses a closer investigation of indicators for a normal distribution of both SDO-E and BATM-S was needed. For both variables the comparison of median, mean as well as the 5% trimmed mean, did not show a substantial difference. The distributions, displayed in histograms were bell-shaped. A slight skewness (.17 for BATM-S and .87 for SDO-E) was not concerning and common when measuring attitudes. Skewed distributions show that the variables of interest have some sort of relevance for the participants and there is a reasonable tendency of agreement or disagreement to the questions asked (Pallant, 2020). The normal Q-Q plots showed a sufficient alignment to a straight line and the detrended Q-Q plots showed a reasonable distribution as well. The Kolmogorov-Smirnov test and the Shapiro-Wilk test were significant for both variables. However, this was expected and not too concerning for samples of this size (Pallant, 2020).

5.2.5 Knowledge about menstruation

The knowledge score showed a mean of 4.81 (SD = 1.19), with a minimum value of 1.00 and a maximum value of 7.00 (N = 480). In percentage, the score of correct answers in the sample was 68.7%. A more detailed display of the items and the frequencies of the answers is

presented here as it informed the decision about further progressing with this variable (see table 7). As can be noted, the ovulation questions had a low proportion of correct answers (K5 = 44.1%, K6 = 25.4%, see table 8) compared to the rest of the questions. This was also reflected in the factor loadings (K5 = .021, K6 = -.003). Local partners suggested that this finding could be due to the exclusion of the fertility-phase aspect of the menstrual cycle in the educational curriculum that is directed by national legislation. For the following analyses, those two questions were excluded¹⁵. The exclusion of K5 and K6 resulted in a range of the score from 1.00 to 5.00 and a mean of 4.11 (SD = .96), which corresponds to 82.4% correct answers. For completeness and comprehension all items are displayed in table 8 and presented separately for sex as well ¹⁶.

Table 8

Results of the knowledge score

K1: Approximately how often does a girl get her period?	Once in her life	Once every year	Every week	Every month	
Female	0.8%	0.8%	0.0%	98.5%	
Male	2.2%	4.9%	1.3%	91.5%	
Total	1.4%	2.7%	0.6%	95.3%	

K2: How long does a menstrual period last on average?	One hour	One day	A few days	Two weeks	All the time
Female	1.1%	4.9%	86.5%	1.9%	5.6%
Male	4.9%	12.1%	52.2%	23.3%	7.2%
Total	2.9%	8.2%	71.0%	11.7%	6.3%

¹⁵As ovulation is not covered in the national curriculum it did not seem fair to the students or considerable of the study context to point out a lack of knowledge about it. Further contextualisation about the thoughtful handling of menstruation knowledge is covered in the theory (2.6) and the discussion chapter (6.1.1).

¹⁶ There was no statistical relevant difference in the knowledge score between the schools or rural and urban districts.

K3: When a girl reaches menarche (her first menstruation), it means she could get pregnant if she has sex.	Yes	No	I do not know
Female	80.8%	6.4%	12.8%
Male	77.2%	10.3%	12.5%
Total	79.1%	8.2%	12.7%
K4: Menstrual period indicates a woman is not pregnant.			
Female	86.0%	11.4%	2.7%
Male	69.6%	19.6%	10.7%
Total	78.5%	15.2%	6.4%
K5: Ovulation happens on average 14 days before period.			
Female	42.3%	16.3	41.3
Male	46.0%	17.4	36.6
Total	44.1%	16.8	39.1
K6: Ovulation happens during period.			
Female	57.0%	22.6%	20.4%
Male	54.9%	30.8%	14.3%
Total	56.0%	26.4%	17.6%
K7: Is it common for girls to have physical discomfort when they have their period?			
Female	92.3%	6.1%	1.5%
Male	80.6%	10.8%	8.6%
Total	87.0%	8.3%	4.8%

Note. The correct answers are in bold font.

5.2.6 Differences in BATM-S, SDO-E and knowledge by sex

A t-test for independent samples was performed to test whether the estimates of study variables differ significantly between girls and boys. A t-test is a parametric test that compares means of groups and has certain assumptions. While most of them are met, the randomness of the sampling is limited as some of the stages of the sampling followed convenience or purpose sampling (see sampling strategy). Furthermore, the independence of

the groups can be questioned as schools are considered as nested samples or clusters. Therefore, an intra-class correlation coefficient was examined and showed values for SDO-E (.01), BATM-S (.00) and knowledge (-.00). This means the concern about the independence of the samples due to clustering in the schools was negligible and a t-test was performed, with a preliminary Levene-test to test for variance homogeneity¹⁷. Based on the results of the Levene-test, variance homogeneity could be confirmed for BATM-S and SDO-E but not for knowledge. Therefore, the sex difference of knowledge was investigated by a Welch-tests for knowledge.

The t-test showed no significant difference for BATM-S between girls (M = 3.13, SD = 8.1) and boys (M = 3.00, SD=.91), with $t(480) = 1.75$, $p = .08$ (two-tailed). The mean difference was .14 (95%CI: -.017 to .29) and Cohen's $d = .16$. The mean of the girls was slightly higher, which means they agreed more strongly that menstruation should be handled secretly compared to boys although the difference did not reach statistical significance.

The SDO-E score showed a small difference between girls (M = 2.15, SD = .89) and boys (M = 2.25, SD = .97) but it was not significant ($t(488) = -1.25$ (488), $p = .21$ (two tailed). The mean difference was -.11 (95%CI: -.27 to .06) and the effect size Cohen's $d = -.11$ as displayed in table 9. Although it is a small and non-significant difference, the tendency shows that boys in the sample prefer more hierarchal structures between women and men than girls.

The difference by sex in the knowledge score was significant with $t(408) = 8.46$, $p < .001$ (two-tailed). The score of correct answers of female students (N = 260) showed a mean of 4.44 (SD = .78), and the male students showed a mean of 3.74 (SD = 1.01). The mean difference was .70 (95%CI: .54 to .87). The effect size is considered large with Cohen's $d = .79$ (Cohen, 1988). All values are displayed in table 9.

¹⁷ Testing measurement variances between girls and boys prior to the t-test was not done as it exceeded the methodological scope of this master thesis.

Table 9

Results of the t-test for independent samples investigating difference by sex in SDO-E, BATM-S and knowledge

	Girls		Boys		<i>t</i> (<i>df</i>)	<i>p</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
BATM-S	3.13	.81	3.00	.91	.08 (480)	.08	.16
SDO-E	2.15	.89	2.25	.98	-1.25(488)	.21	-.11
Knowledge	4.44	.78	3.74	1.01	.85 (408)	<.001	.79

*Note. Sex was coded as 1 = female, 2 = male. As a reiteration: SDO-E and BATM-S were measured on a 6-point Likert-scale and knowledge had maximal score of 5. M = mean, SD = standard deviation, df = degrees of freedom, α -level = .05, two-tailed. Convention for Cohen's *d*: .2 = small effect, .5 = medium effect, .6 = large effect.*

5.3 Correlations

A correlational analysis was conducted for the main study variables¹⁸. SDO-E and BATM-S showed a significant positive correlation of moderate strength with $r(488) = .142$, $p < .01$. This means a participant who scores high in the support for hierarchal structures also scored high in the support to keep menstruation a secret. Between knowledge and BATM-S a significant moderate correlation could be found as well with $r(488) = .138$, $p < .01$. This means a person who has higher knowledge about menstruation also agrees stronger to keep the menstruation secret. Between the two independent variables the correlation was moderate and significant as well with $r(488) = .115$, $p < .05$. The correlation coefficient between the two independent variables is of no concern for multicollinearity because it is below $r = .08$ (Field, 2018). The correlations are displayed in table 10.

¹⁸ The correlational analysis was done independently from SEM and was not conducted with latent variables but with the sum-scores of the variables.

Table 10*Correlations between the study variables*

	1	2	3
1. <i>BATM_S</i>			
2. <i>SDO_E</i>	.142** [.05;.02]		
3. <i>Knowledge</i>	.138** [.05;.22]	.115* [.03;.20]	

Note. The values in the square brackets represents the 95% confidence interval. Significance levels are indicated by * $p < .05$ and ** ($p < .01$).

5.4 Models

After investigating the measurements of the study variables in detail, the latent study variables derived from the CFA could be introduced in a SEM and set into relation to each other.

5.4.1 Bivariate analysis *SDO-E* and *BATM-S*

In the first model *BATM-S* was regressed on *SDO-E* to address research question two: *To what extent is there a relationship between social dominance orientation and attitude towards menstruation?* The regression with *SDO-E* as the predictor showed the following results: *SDO-E* predicted 2.6% ($R^2 = .026$) of the variance of *BATM-S*. The standardized β showed a value of .163 ($p = .028$). This means that with each increasing unit of *SDO-E* the attitude towards menstruation secrecy increased by 16.3%. In other words, a participant who supported societal structures being more hierarchal also supported the conviction that period should be kept secret in society. To conclude, the prediction of *BATM-S* by *SDO-E* is significant with a small effect. All estimates are displayed in table 11.

Table 11*Bivariate regression with *BATM-S* as the dependent variable*

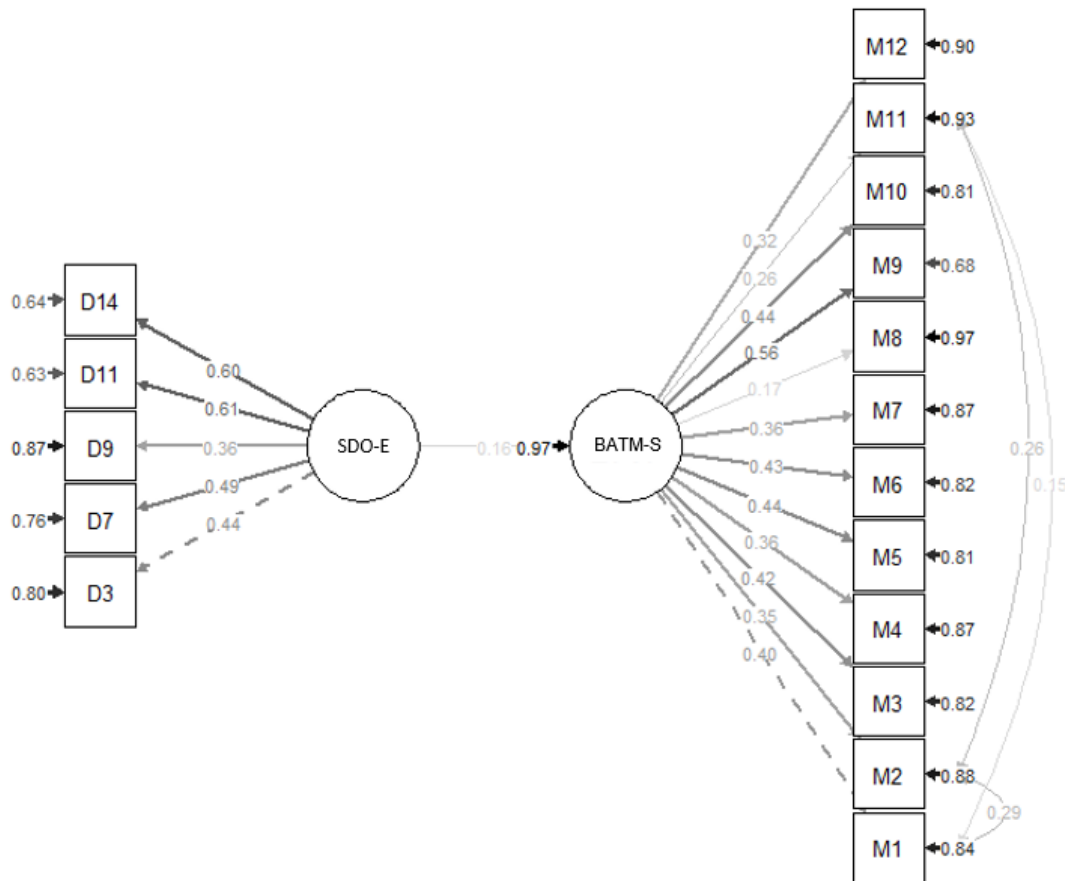
Variables	B	β	SE	95% CI	
				lower	upper
Intercept	.000	.000	-	.00	.00
<i>SDO-E</i>	.181*	.163*	.08	.02	.34
R^2	.026				

Note. SE= Standard error, CI = Confidence interval, Significance levels are indicated by * $p < .05$.

The goodness-of-fit indices for the SEM model were $\chi^2(115) = 187.70$ ($p < .001$), CFI = .90, TLI = .89, RMSEA = .04., being acceptable. In figure 5 below, the path-diagram is presented showing the items (observed variables), the latent factors and the relationships.

Figure 5

Path model of the SEM with SDO-E and BATM-S



Note. The squares represent the observed variables/items, while the circles represent the latent variables. The single-headed arrows show directional relationships and can indicate loadings (between the latent variables to the items), or regression paths (between the latent predictor variable and the dependent variable). The object at the tail of the single-headed arrow represents the predictor. The darkness of the lines represents the strength of the relationships. Dashed lines indicate fixed parameters (to the value 1). The double headed arrows pointing to two objects indicate the allowed covariance between the reversed items M1, M2, and M3 based on the CFA results. The small bold arrows pointing to the observed variables show the unique variance of the items, respectively the residual variance for the latent variables. The residual variance of latent variable BATM-S is complementary to R^2 and indicates the variance that is not explained by the model. Own work.

5.4.2 Final model with SDO and knowledge as predictors of BATM-S

SDO and menstrual knowledge were introduced as predictors of BATM-S in a SEM in the final model according to research question three: *To what extent are social dominance orientation and menstruation knowledge associated with attitude towards menstruation?* The final model showed the following fit-indices: $\chi^2(203) = 325.634$, ($p < .001$), CFI = .86, TLI = .85, RMSEA = .04. Not all the estimates met the cut-off values, which requires caution in the interpretation.

Through this model 3.5% of the variance of BATM-S was explained ($r^2 = .035$). The standardized β was .233 ($p = .08$) for the predictor SDO, meaning higher support for hierarchal structures is associated with higher support to keep menstruation a secret. Knowledge showed a positive relationship with BATM-S of .101 ($p = .50$), meaning that higher knowledge about menstruation is related with higher support to keep menstruation a secret. However, the unique contribution of each predictor to the variance of BATM-S was not significant and is therefore not interpretable. The two predictors (latent variables), knowledge and SDO, were significant negatively correlated with each other by $-.063$ ($p < .001$). The path model is shown below in figure 6 and estimates are displayed in table 12.

Table 12

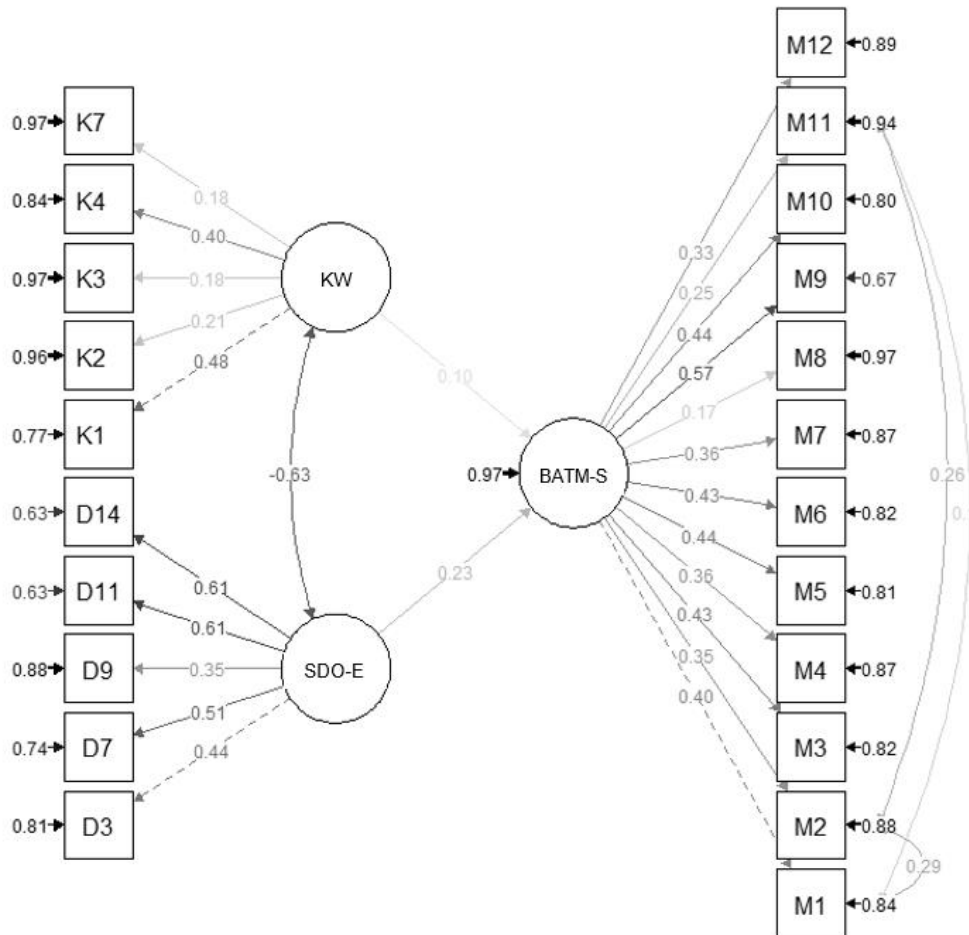
Multiple regression with BATM-S as dependent variable

Variables	B	β	SE	95% CI	
				lower	upper
Intercept	.000	.000	-	.00	.00
SDO-E	.264	.233	.02	-.03	.56
Knowledge	.707	.101	1.05	-.34	.28
R ²	.035				

Note. SE= Standard error, CI = Confidence interval.

Figure 6

Path model of the final model including knowledge and SDO as independent variables and BATM-S as the dependent variable



Note. The squares represent the observed variables/items, while the circles represent the latent variables. The single-headed arrows show directional relationships and can indicate loadings (between the latent variables to the items), correlations (between the two latent predictor variables) or regression paths (between the latent predictor variables and the dependent variable); the object at the tail of the arrow being the predictor. The darkness of the lines represents the strength of the relationships. Dashed lines indicate fixed parameters (to the value 1). The double headed arrows pointing to two objects indicate the allowed covariance between the reversed items M1, M2, and M3 based on CFA results. The small bold arrows pointing to the observed variables show the unique variance of the items, respectively the residual variance for the latent variables. The residual variance of latent variable BATM-S is complementary to R^2 and indicates the variance that is not explained by the model. KW = knowledge about menstruation. Own work.

5.4.3 Multigroup analysis with sex as the grouping variable

The multigroup analysis addresses research question four: *Is there a significant difference by sex in the association between social dominance orientation, knowledge about menstruation and attitude towards menstruation?*

Sex was introduced as a grouping variable to the final model, which created the base model in which variances based on sex were free. The fit indices of the base model did not reach cut-off values with $\chi^2(406) = 614.796$, ($p < .001$), CFI = .79, TLI = .76, RMSEA = .05. Hence it is formally not suitable for further comparisons. However, when testing it against a model where sex is constrained for all paths, it showed a significant difference with $\Delta\chi^2(446) = 121.78$, $p < .001$. This meant that it could be assumed that some paths in the model had a specific variance based on sex. This suggestion was also supported through the worse fit of the constrained model compared to the base model with $\chi^2(446) = 736.57$, ($p < .001$), CFI = .71, TLI = .70, RMSEA = .05. If the constrained model has a worse fit than the base model, it can usually be assumed that the constraints are not valid, which in turn means that there is a variation in the model based on the group (here: sex). However, as both fits were below the cut-off values this conclusion could only be drawn with caution and the overall fit of both models made interpretations formally not legit. The poor fits could also be the reason why the following models, in which single paths were constrained, showed no significant difference to the base model as displayed in table 13. This meant that the paths in the model which differed between sex could not be identified. Another reason why the variation by sex of the individual paths could not be determined could be the power, since in a multigroup analysis the sample is divided and thus the power decreases.

Therefore, an interaction analyses with each path of the SEM model was conducted as an exploratory analysis. A moderation with sex as the moderator was performed for the relationship between SDO-E and BATM-S and for the relationship between knowledge and BATM-S. The results were not significant. Thus, difference by sex in the relationships between the variables could not be detected or is not existent.

Table 13*Multigroup analysis*

	χ^2	df	Comparison to base model	
			$\Delta \chi^2$	Δdf
Base model (free)	614.796***	406		
Constrained model	736.572***	446	121.78***	40
One-path constrained models				
BATM-S – SDO-E constrained	614.819***	407	.02	1
BATM-S – knowledge constrained	614.820***	407	.02	1

Note. *df* = degrees of freedom, Significance levels are indicated by *** $p(<.05)$.

VI Discussion

In this chapter, the findings of the analyses will be interpreted and set in relation with theory and previous research. This will be followed by a discussion of general methodological considerations about the study including limitations and strengths of the current study. Finally, implication based on the findings will be presented.

6.1 Study findings

The results can be summarised as follows: The assessment of the scales (research question one) showed that among the different versions of the SDO scales, the short scale of the anti-egalitarianism dimension (SDO-E_{short}, after selection referred to as SDO-E) had the highest reliability and the best fit estimates in the CFA. Thus, the inferential analyses were proceeded with that scale. BATM-S showed good reliability and fit indices after allowing the reversed items to correlate (M1, M2, M11). The knowledge index was fairly high and showed high context specificity of some items, and so did the other scales in the study.

Difference by sex of all three variables – SDO-E, BATM-S and knowledge- were investigated, with only a significant result for knowledge: girls had higher knowledge about menstruation than boys.

A positive small but significant relationship between the latent variables of SDO-E and BATM-S could be found (research question two). However, when adding knowledge as a second predictor into the model (research question three), the relationship between the predictors and BATM-S became insignificant. No difference by sex for the strengths of the associations between the variables could be detected (research question four).

6.1.1 Applicability of the scales in the study context

The scales have already been briefly discussed alongside the results in the previous chapter to inform the reader about the decisions made during the analysis process based on data. In this section, the findings be contextualised with previous empirical studies¹⁹ and

¹⁹ The direct comparability of distribution and measure of central tendency with the original studies of BATM-S and SDO-E is limited as the original scale used a 5-point-likert scale.

theory, accompanied with specific methodological consideration about the particular findings according to research question one: *To what extent can the selected scales— beliefs and attitude towards menstruation (secrecy dimension), social dominance orientation and knowledge about menstruation – be applied in the context of secondary schools in Mwanza, Tanzania?*

6.1.1.1 Social dominance orientation and its dimensions. The analyses showed that the short scale of the anti-egalitarianism dimension of SDO (i.e., SDO-E) fit the data better than the dominance dimension (i.e, SDO-D). The finding that the anti-egalitarianism dimension had a higher resonance in this study than the dominance dimension was not too surprising. The anti-egalitarianism dimension was anticipated to have a higher theoretical suitability for the study. As a reiteration, the anti-egalitarianism dimension captures “a preference for systems of group-based inequality that are maintained by an interrelated network of subtle hierarchy-enhancing ideologies and social policies” (Ho et al., 2015, p. 2). This is conceptually close to stigma-power, being: “motivations to keep people down, in or away and (...) they best achieve these aims through stigma processes that are indirect, broadly effective, and hidden in taken-for-granted cultural circumstances” (Link & Phelan, 2014, p. 1). More subtle strategies along the lines of the anti-egalitarianism dimension have been shown to be easier to agree to for participants in studies than the explicit exercise of dominance aligning with the dominance dimension of SDO (Ho et al., 2015). Further, theories concerned with power (such as hegemonic masculinity, stigma-power and SDO itself) discussed that subtle strategies are more effective to maintain power hierarchies, as it causes less confrontation than direct ways of domination (Ho et al., 2015; Link & Phelan, 2014, Messerschmidt, 2019). The theory of hegemonic masculinity specifically states that the persistence of patriarchal structures in most cases is successfully maintained by legitimising the status-quo instead of direct domination (Messerschmidt, 2019). The items of the short anti-egalitarianism dimension very much reflect such legitimising statements for the inequality between women and men (whereas the items of the dominance dimensions have more of an active nature to oppress women). Therefore, the better the better suit of the anti-egalitarianism scale could be deduced from theory.

Another reason could lie in the age group. Cadamuro et al., (2022) also found higher consistency for the anti-egalitarianism scales than for the dominance scales. Research showed that adolescents already have developed a sense for group membership and according to that status and equality and inequality of groups (Cadamuro et al., 2022; Raabe & Beelmann, 2011). This has been viewed by researchers as a functional strategy by which young people can break down the newly perceived complexity of society into fewer elements (Aboud, 2003; Cadamuro et al., 2022; Doyle & Aboud, 1995). It can be seen as a simplification which is of observational and descriptive nature. It could be that the young participants therefore found statements of the anti-egalitarianism dimension about group hierarchies relatable, as they are familiar with those thoughts and ideas about intergroup status. However, statements included in the dominance dimensions about creating or maintaining this hierarchy actively could have seemed rather strange to them as they go beyond those descriptive ideas about hierarchies. These speculations require more in-depth research in order to be utilised for evidence-based reasoning for the higher consistency and accuracy of the anti-egalitarianism dimension in this and the original study (Cadamuro et al., 2022).

There are also technical considerations about the design of the scale which are important to discuss in order to address research question one. The items of the anti-egalitarianism dimension were inverted, so that low scores indicated high support for hierarchical intergroup structures. This means that participants who had supportive beliefs about hierarchical societies expressed this by “agreeing less” to questions measuring the anti-egalitarianism dimension. In turn, for the dominance dimension higher support for hierarchal societies was expressed by “agreeing more”. Therefore, it might have been easier to express support for hierarchal society structures within the anti-egalitarianism dimension; not only because of the less extreme wording, but also because of the direction of the items, which required less proactive expression of support. Similar considerations can be found in previous studies (Ho et al., 2015).

Furthermore, the wording of some items could have had an effect on the suitability. Three items (D6, D8, D10)²⁰ with low factor loadings in the preliminary analyses of the current study and in the original studies (Cadamuro et al., 2022) were not included in the short version of the anti-egalitarianism dimension. In the translation process both Kiswahili speaking translators explained that the wording in item D6 “kept in their place” is a metaphor that does not work well in Kiswahili, as it sounds like keeping groups physically apart. Moreover, the word “dictate” (D10) was estimated as a strong and unusual word for the youth in Tanzania by the local partners. Those could be possible wording effects that make the short the anti-egalitarianism dimension, without the challenging items, the best suitable scale for the study context.

6.1.1.2 Attitude towards menstruation. The scales used in this study was a sub-scale adapted from Marván et al. (2006), measuring the secrecy aspect of the attitude towards menstruation. The sub-scale showed to have a good applicability in the study’s context, while it did not reach the same estimates of internal consistency as in the original study²¹ (Marván et al., 2006). One reason could be the context specificity. Item M8, which asks about the feeling of discomfort while seeing advertisement showed to not contribute well to the scale in this study. After spending time in the region of the study context and through conversations with local partners, it was concluded that there was little to no exposure to public promotion of period products, particularly in rural areas. Therefore, the item could have been less relevant or relatable to participants, which in turn could result in a low contribution of that item to the scale. In the original scale, which was validated in Mexico and the US, this item did not show lower values than the rest of the items (Marván et al., 2006), supporting the assumption of context specificity of this particular item. The sensitivity for the context of this item is a valuable insight about the BATM-S scale. Another reason for the lower reliability could also be that the age group of this current study was younger than the sample of the

²⁰D6: Should some groups of people be kept in their place, in order to not create problems?

D8: Should some groups of people be forbidden from doing what they want?

D10: Should no single group dictate in society?

²¹ $\alpha = .67$ in this study and $\alpha = .79$ in the original study (Marván et al., 2006)

original study (Marván et al., 2006), which could have an effect on understandability of the scales.

When examining the construct-validity and reliability of the scale the three reversed items (M1, M2, M11) demanded attention. They showed high modification indices and a high inter-item correlation with each other and lower correlations with the rest of the items. Reversed items are often implemented in scales to prevent agreement or anchor bias and to increase or check the attention of participants while filling out the questionnaire. However, reversed items tend to affect the inter-item reliability, factor structures and overall reliability of scales (Weijters & Baumgartner, 2012). This was also the case for this study. However, the allowed covariance of these items in the latent variable could partially accommodate for this effect and they were kept in the scale because they showed reasonable high factor loadings.

6.1.1.3 Knowledge. This study considered recent discussion evolved in critical menstruation studies about menstrual health literacy. To reiterate, those considerations are to include boys, consider context specificity of knowledge to focusing on most relevant aspects of knowledge about menstruation instead of biological details (see section 6.2) (Bobel, 2010; Olson et al., 2022). Therefore, the scale was adapted from a study that was conducted in the same region with female and male secondary school students and items were excluded that seemed to be very medical and irrelevant for the target group (see section 4.5.2.1) (Benshaul-Tolonen et al., 2020), as said before. The abovementioned considerations could be a reason why the knowledge score was fairly high and therefore contradictory to existing literature reporting low knowledge (of girls) in LMIC (Chandra-Mouli & Patel, 2020; Coast et al., 2019). Again, comparisons between studies that investigated knowledge should be done with caution as the questions which are used to measure knowledge differ from study to study.

However, comparing the current study with the original study provides interesting insights (Benshaul-Tolonen et al., 2020). The score of this study compared to the original study was slightly higher, which could be due to the exclusion of the items with advanced facts about menstruation. The higher score in this study could also related to difference of the age range. The age range of the original study (Benshaul-Tolonen et al., 2020) was from 10 to 22 years. The exact distribution of the age in the sample of the original study was not reported. However, very young students could have influenced a lower score because menstruation is

not relevant for them yet or they have not learned about menstruation yet at all, as literature shows that the time of menarche usually corresponds with learning about menstruation the first time from female relatives (Chandra-Mouli & Patel, 2020; Coast et al., 2019), being between the age of 13-16 in Tanzania (Whitworth et al., 2023).

One technical aspect that the authors of the original study pointed out “is that in Kiswahili, the word for month (Mwezi) is the same as the informal word for menstruation” (Benshaul-Tolonen et al., 2020, p. 9) and therefore the first question (K1) could be fairly easy to answer. This is reflected in the results, showing that almost all students answered the question correctly in the current study²². This implies that in future studies conducted in Kiswahili, this item could be excluded as it biases the score upwards. Another similarity of the current and original study was the substantially lower number of correct answers in questions regarding ovulation (K5 and K6), compared to the other questions. This is comprehensible as the schools in which the current study and the original studies were undertaken should be teaching the same national curriculum²³.

6.1.2 Differences in the study variables by sex

Only knowledge showed a significant difference between boys and girls. Nevertheless, anticipations and considerations about the not-found differences in the other study variables will be discussed as well.

6.1.2.1 Difference by sex in social dominance orientation. Male participants tend to agree stronger to hierarchal statements about society than women according to the invariance-hypothesis (Cadamuro et al., 2022; Pratto et al., 2006). The consistency of these higher SDO scores for men were also found in studies investigating group-dynamics based on race, religion or other group identities (Pratto et al., 2006). However, in the case of applying SDO for gender-based hierarchies – or for the *specific set* gender, to speak in the terms of SDT-

²² 95% of the student answered correctly that menstruation happens once a month.

²³ According to the Tanzanian partners, the reason for the exclusion of the fertility phase is that there are concerns about students using this information as a contraception strategy, which does not sufficiently protect from sexually transmitted diseases or pregnancies.

higher support of men and boys would be particularly logical. It is intuitive to favour a hierarchy which gives one an advantage (Connell, 2013).

Although, patriarchal structures persist and still advantage men to a certain degree in all societies, a replication of the invariance-hypothesis was particularly anticipated considering the dynamic of male dominance and exercised power reported by previous research in Tanzania (D'Exelle & Ringdal, 2022; Jakobsen, 2014, 2018; Sommer, 2010b; UNDP, 2022).

Nevertheless, the anticipation based on the theory and literature could not be supported in this study. Although the tendency showed higher scores in SDO-E for boys than for girls, it did not reach statistical significance. Thus, the invariance hypothesis could not be verified. In another study with adolescent participants, the invariance-hypothesis could not be confirmed either (Aranda et al., 2015). The age of the participants of that study (Aranda et al., 2015) and this current study is an obvious difference to the vast majority of SDO research with adults that informed the invariance-hypothesis. The effect of age related to SDO need further investigation in future research and will be picked up later in the discussion. However, the other study with adolescents found that the invariance-hypothesis is mediated by the self-attribution of gender stereotypes and gender identification instead of the biological sex. The authors claim this as the reason for the non-verification of the invariance hypotheses in their study (Aranda et al., 2015). The own identification with a group, is a base element in SDT (Sidanius & Pratto, 2001), supporting the suggestion of Aranda et al. (2015).

Another reason for the unconfirmed invariance hypothesis in this study could lie in the measurement. Although the short scale of the anti-egalitarianism dimension showed to be the best applicable version of the scale, estimates of reliability and construct-validity were not ideal supposing that there might have been issues with understandability or relevance of the items.

6.1.2.2 Difference by sex in attitude towards menstruation. In existing research about attitude towards menstruation, usually men report a more negative attitude towards menstruation (Cheng et al., 2007; Eyring et al., 2023; Forbes et al., 2003; Peranovic & Bentley, 2017; Wong et al., 2013). This could not be confirmed in this study and neither in the validation study of the BATM-S scale; the difference by sex was insignificant (Marván et al., 2006). The

question arises why this is the case and will be addressed in two points: the first point is anchored in theory while the second point is based on the variety of attitude measurements and possible confounding variables.

Scholarship acknowledges the self-internalisation of norms by the oppressed in many different theories. For example the theory of stigma-power accounts for self-internalised stigma (Link & Phelan, 2014), meaning that in this context girls would share the devaluating beliefs and feelings about their menstruation themselves. Similarly, the *menstrual concealment imperative* (Wood, 2020) encompasses the internalised perceptions held by women about menstruating bodies being negative and worth hiding. The *menstrual concealment imperative* shares conceptual similarity with the term *menstrunormativity*, which describes the normativity of menstruating “the right way” that affects women and is co-produced by them in the socio-cultural and in the individual level (Persdotter, 2020). Thus, these internalisation can be fed by observations among friends or family or more formally through educational sessions how to manage the menstruation or advertisements of period product (Wood, 2020). Differentiating the individual sphere from the socio-cultural sphere could be an explanation why more negative attitudes held by boys could not be found in this study and thereby links to another theory. The attitude theory states that the directedness of an attitude by an individual can be on a collective or a personal level (Eagly & Chaiken, 1993, 2007). The questions in the BATM-S scale addressed a more collective level of menstruation (norms to keep menstruation a secret). It could be that boys indeed answered those questions in a more general collective sense while girls’ responses were influenced by their own personal concern to violate those norms involuntarily and being sanctioned for it, which is according to all the theories presented as a core reason for the considerable effort of women hiding their menstruating status. This concern of violating the norms by blood stains for example, was reported to be very present in many empirical studies by girls in LMIC and causing high levels of anxiety (Hennegan et al., 2021). While the sex difference was not significant in either direction, it can still be possible that these personal fears have influenced the responses of girls (and not boys). This potentially cushioned a generally more negative attitude of boys in the collective sense and consecutively is responsible for this study to not be in line with

previous findings (Cheng et al., 2007; Eyring et al., 2023; Forbes et al., 2003; Peranovic & Bentley, 2017; Wong et al., 2013).

While BATM-S selectively measures the norms to keep menstruation secret, other menstruation attitude scales measure other aspects like disgust or liability (Brooks-Gunn & Ruble, 1980 ; Marván et al., 2006), which could explain another reason why this current study and the original study (Marván et al., 2006) did not line up with previous research based on a different scope and focus of the questions.

Further, one study in which men had a more negative attitude towards menstruation than women, found that this difference was not explained by the sex of the participants but mainly by sexist and heteronormative views that were more strongly held by men than by women (Eyring et al., 2023). This supports the approach of this study to investigate patriarchal beliefs and go beyond sex as an analytical variable for the attitude towards menstruation (in research question two).

6.1.2.3 Difference by sex in knowledge. The differences between girls and boys in the current study was significant. Higher knowledge scores for female participants align with existing literature (Allen et al., 2011; Erchull, 2020; Eyring et al., 2023; Olson et al., 2022). Previous presented research observed that girls in many contexts receive more sex education and education about menstruation than boys in schools and beyond (Allen et al., 2011; Erchull, 2020).

In the Tanzanian curriculum, the topics of reproductive health and menstruation are covered. However, a Tanzanian study found that there was an imbalance in the amount of menstrual education that girls receive compared to boys in school (Guya et al., 2014). This could mean that boys rely more strongly on sources outside of school to learn about menstruation than girls. When exploring the private sphere as a learning area for menstruation, an imbalance related to gender can be found as well. A study in Tanzania reported that communication outside of school about menstruation only takes place among female family members (Sommer, 2010a). Therefore, it is likely that male family members are excluded. Studies in other contexts showed that boys and men reported to encounter the topic of menstruation in their homes in an accidental and fragmented way which was to their

dissatisfaction. Some report a feeling that they have to gather pieces of information and put them together and that they used to feel unsettled at their first encounter with menstruation as well (Allen et al., 2011). In fact, the norm of keeping menstruation secret prevents boys to learn about it in the family context (Allen et al., 2011; Erchull, 2020; Olson et al., 2022). The finding of lower knowledge of boys compared to girls in this current study and previous research is therefore not surprising. However, even though this outcome was expected, this does not mean it is desirable. Ideally, boys and girls would maximally informed about menstruation; in previous research men also expressed that knowledge helped them to support their partner and daughters better (Allen et al., 2011; Peranovic & Bentley, 2017). These expressions and the observed menstrual knowledge difference between girls and boys in this study advocates to include boys more in menstrual education in the future in both schools and at home. Both settings showed tendencies to be gender-segregated when the topic of menstruation is discussed in Tanzania and beyond (Allen et al., 2011; Guya et al., 2014).

6.1.3 Found and not found relationships between the study variables

The used method for the analysis of the relationships tests whether the model aligns to the data structure or not. If the relationships between variable are interpretable depends therefore not only on the significance level but also on that fit of the model to the data. The found relationships will be interpreted in this section, while considerations about the relationships that could not be confirmed will be discussed as well.

6.1.3.1 The relation of patriarchal beliefs and the attitude towards menstruation. A relationship between SDO-E and BATM-S was found. While this is the first study measuring the relationship between these two constructs, the results can be set in relation to tangent studies. As presented in the literature review, the association between negative menstruation attitudes and sexist views could also be found in other studies (in the US) (Eyring et al., 2023; Forbes et al., 2003). The author from one of the studies stated: “[b]ecause menstrual taboos stigmatize women and are used to justify patriarchal privilege a relationship should be found between sexist beliefs and negative perceptions of menstruating women” (Forbes, 2003, p. 58). This anticipation of the important role of patriarchal beliefs for the attitude towards menstruation was also valid for this study and is anchored in theory.

SDT and the theory of stigma-power have a common elementary origin: power that is unevenly distributed in a hierarchy based on groups (Link & Phelan, 2014; Persdotter, 2020; Phelan et al., 2008; Pratto et al., 1994; Wood, 2020). Hegemony only exists in relation (Connell, 2013; Connell & Messerschmidt, 2005) and so does stigma (Link & Phelan, 2014). Exclusive traits of marginalised groups (here menstruation as a symbol of femininity) are subject of stigmatisation and further, this stigmatisation is functional to maintain the hierarchy (Link & Phelan, 2014; Phelan et al., 2008; Sidanius & Pratto, 2001). Imposing shame and norms on the lower status group regarding that characteristic trait, in this case is menstruation, can be seen as an example of these dynamics that manifest but also maintain the patriarchal power (Olson et al., 2022). It was therefore expected that the agreement with a hierarchal organisation between men and women is positively associated with the agreement to the norm to keep menstruation secret, which represents the handling of a stigmatised topic.

The observed association between patriarchal beliefs and the attitude to keep menstruation secret ties into a broader theoretical network. In fact, multiple theories contributed to the initial conceptualisation of the study. Overarching theories of gender studies informed the premises of patriarchal structures, power and oppression such as the relational theory of gender (Connell, 2013). Intergroup theories and theories that explore stigma, build the foundation of this study, most importantly the theory of stigma-power (Link & Phelan, 2014) and SDT. The latter and its strategies to justify, maintain and reinforce the group inequality can be neatly aligned with empirical findings of studies about the reality of menstruating girls and women (Hennegan et al., 2019), which urged to investigate the specific construct SDO-E with the norm to keep menstruation a secret. Lastly, the finding of this study supports theoretical concepts within critical menstruation research such as the concealment imperative (Wood, 2020) and menstrunormativity (Persdotter, 2020)). Those theories address the imposed but reproduced norms to conceal the period as a matter of patriarchal oppression, which is widely convergent with the found association between patriarchal beliefs and attitude towards keeping menstruation a secret in this study.

6.1.2.2 Searching for the role of knowledge and sex. The idea of investigating the role of knowledge for the attitude towards menstruation was inspired by the existing literature and theory. In the theory of attitude and the intra-attitudinal structure, the cognitive

component (which is available information about the topic) plays an important role for the evaluation of a topic (Eagly & Chaiken, 1993, 2007). Moreover, attitude is a tendency and not a preposition; meaning that it is responsive to external influences and can change over time (Eagly & Chaiken, 2007). So, receiving information about menstruation could theoretically shape the attitude about it. These theories are supported by the prominence of knowledge in research and menstruation projects and its shown potential (Chandra-Mouli & Patel, 2020; Coast et al., 2019; Hennegan & Montgomery, 2016; Sumpter & Torondel, 2013); while others say the sole focus on knowledge should be widened to the social embedment of menstruation to address the stigma as such (MacLean et al., 2020).

This discourse about the role of knowledge made it interesting to compare particularly those two aspects: patriarchal beliefs and knowledge and their contribution to the attitude towards menstruation in research question three. This approach aligns with the view critical menstruation scholars to consider both aspects, patriarchal structures and knowledge, in research and practice (Bobel, 2019) However, the statistical analysis could not provide evidence as the model did not fit the data well, and the regression coefficients were not statistically significant. This could be due to technical reasons of the analysis, which will be explained towards end of the section.

However, in the preliminary correlational analysis with the observed variables, a significant positive relationship was found between knowledge and BATM-S, which provokes a discussion of this finding. This positive relationship means participants that scored higher in knowledge also agreed stronger to that menstruation should be kept secret (than participants with lower knowledge score). One option of interpretation is that a negative opinion about a topic could influence the willingness to learn or keep information about it. The other option of interpretation is that a person needs to have knowledge about something in order to mature a (negative) attitude towards it. The latter closely aligns with the intra-attitudinal structure that knowledge as the cognitive component influences the evaluation of a topic (Eagly & Chaiken, 1993). However, in theory the direction of this effect caused by information is not determined, meaning that information about menstruation can shape the attitude towards menstruation in a positive or negative way. This possibility is picked up by the already presented critical perspective on the provision of information about menstruation, saying that

the way and focus of these knowledge transmissions can also shape narratives and attitudes about menstruation negatively (Allen et al., 2011; Bobel, 2019; Olson et al., 2022). It is possible that the information the students received about menstruation were accompanied with many tips about how to conceal the period which communicated that menstruation is supposed to be secret, implying the importance to hide it. The finding of this correlation stands in contrast to the many studies that found higher knowledge being related with less negative views about menstruation (Chandra-Mouli & Patel, 2020; Coast et al., 2019). However, another study in Tanzania could not confirm this commonly found relationship either (Benshaul-Tolonen et al. (2020). Instead, leaned (insignificant) results towards the same direction as in this study. This could give rise to speculations that in the Tanzanian context, the information that is provided by schools or in the socio-cultural discourse are rather contributing to a narrative towards concealing the period instead of shaping a more open and positive attitude towards it. While the results of this study and the other study in Tanzania (Benshaul-Tolonen et al., 2020) do not allow solid conclusion, it raises questions regarding the focus and narrative of provided knowledge about menstruation and it challenges the notion that any kind of knowledge about menstruation challenges stigma.

Although the final model did not have a sufficient fit, an investigation was still attempted to examine whether the strengths of the relationships between the study variables differ by sex. Therefore, sex was added to the final as a grouping factor. This interest was influenced by the study variables themselves and their theoretical and empirical history of showing different pattern influenced by sex (which was comprehensively discussed in 6.1.2.). It was therefore a logical step to also examine the final model and the associations between the study variables for differences based on sex as well. Furthermore, there are numerous studies with girls that have identified knowledge as a predictor for a more positive attitude towards menstruation on the one hand (leaving aside the exact focus of the knowledge variable and attitudes) (Chandra-Mouli & Patel, 2020; Coast et al., 2019; Holmes et al., 2021) and studies with men that have shown that sexist attitudes are related to negative attitudes towards menstruation on the other (Eyring et al., 2023; Forbes et al., 2003. Since this study was interested in both associations and had female and male participants, it was logical to examine the associations with sex as an analytical factor. This analysis was seen as having the

potential to produce valuable implication; seeing that in the Tanzanian context sex education often takes place segregated for boys and girls in schools (Guya et al., 2014). Accommodating to this practice, it would then be helpful to know what matters more for boys or girls in terms of the stigma around menstruation and in turn what topic could be discussed to counteract this stigma: either knowledge or patriarchal beliefs. In case a difference would have been found it would enable the planning of future projects to be more oriented on target groups; meaning boys and girls. However, the statistical tests could not specify the sex differences in the relationships between the study variables.

6.1.2.3 Technical reasons why the search was not successful.

While the finding of the relation between knowledge and BATM-S based on the correlational analysis was interesting and worth discussing, the relationship could not be confirmed in the model that included both knowledge and SDO-E as independent variables. The model with the two predictors had insufficient fit and showed insignificant coefficients for the relationship. The fit of the model is influenced by the fits of the measurements, being the smaller-scaled units in the model. Those fits were acceptable but not ideal, which could have influenced the overall fit of the model and eventually the insignificance of the relationships between the study variable. Suspecting the increased number of indicators in relation to the sample size after adding knowledge as a reason for insignificance, could be dismissed. The conducted power analysis for this study included the knowledge indicators.

The multigroup analysis with sex as a group variable did also not showed sex as a significant grouping variable. In SEM modelling the relationships between two concepts are called paths. Although the constrained model was significantly different to the base model and the worse fit of the constrained model indicated variance due to sex, relevant paths could not be identified through further testing with path-wise constrained models. This means that there was an indication that sex mattered for the overall model, but it could not be identified which relationships are particularly influenced by sex. This could be due to the poor over all fit of the final model, as explained in the previous paragraph. Another possible reason could have been the decreased power by splitting the sample in two groups. However, the explorative analyses with an interaction model (moderation analysis with sex as the moderator), which should not have that power issue, did not find significant findings either.

6.2 Considerations about the study

After the discussion of the study findings, broader considerations about the thesis will be provided. This covers elements of the study design, the data collection and the role of a researcher (which will be written in an active and personal voice for better readability).

6.2.1 A master student from Norway in Tanzania

The fieldwork for this thesis was my first academic project abroad. Seeing that I am based in Norway and conducting this study in Tanzania required a high amount of awareness. There was a close and enriching cooperation with the local partners in conceptualising the study as well as facilitating it. Valuable advice for the study was given by the local partners of academic and practical nature, which were followed. My stay in Tanzania was around three months including weeks that were spent accompanying the Tanzanian researchers on their own field work and visiting an NGO that worked with the topic of menstruation in the region. This time and experience were helpful to understand the context better. Another effect through the time spent there was that navigating in the setting became easier and connections with small local enterprises could be made to facilitate the study. However, the role of the researcher still has problematic potential and there are many pitfalls in menstruation research, which critical menstruation studies have pointed out and were aimed to be avoided. As said previously, it should be avoided to point out a lack of knowledge or alternative practices in an undifferentiated manner and using narratives of the “underdeveloped girls” without agency and knowledge about their bodies (Bobel, 2019). This was for example followed within the knowledge section by choosing a scale that has already been applied in the study context and excluding irrelevant and medically detailed questions which would have probably biased the scores down (see section 4.5.2.1). Another example was that this study did not include the topic of restrictions for menstruating girls in the empirical part, although it would possibly be related to both, patriarchal views and the concealment of menstruation. However, including this issue would have requested more context by using in-depth methods. Superficially measuring the presence or absence of restrictions at home in a questionnaire would not be sufficient and would at most create a contrast-rich and dramatic narrative as it is often done by public media and campaigns in regard of menstruation in the global south (Bobel, 2019). While these and more aspects were

carefully considered in the study planning, they were most likely still effects that influenced the data collection based on my role as a guest from Norway. They are considered methodological and are therefore discussed in the limitations.

6.2.2 Limitations of the study

This master thesis has several limiting factors which can be attributed to the study design and factors that occurred while conducting the study. As a preface, it should be said that a pre-study would have helped to test the scales and the data collection procedure in advance and reduce the limitations of the study. However, the time it took to obtain the permits and the overall time frame of the thesis did not allow a pre-test in Tanzania.

6.2.2.1 Study design. This study was a non-experimental study with a cross-sectional design. Limiting about this design is the finite informative value, which only entails relationships between concepts without being able to claim causality, in contrast to an intervention study or experiments. Furthermore, this design provided only a “snapshot” of the different attitudes of the student at the time of the data collection, and a reflection of changes in their attitudes or trends remain unknown (Neuman, 2014).

The questionnaire did only consist of a certain set of questions and concepts. The social situation of a social-human being is much more complicated than the conceptual model that this study entails. Therefore, the effect of confounding variables cannot be ruled out entirely. It is possible that for example conservative values underlyingly affects both: the attitude to keep menstruation a secret and patriarchal beliefs. The presence of patriarchal structures at home could also have an influence on students’ own perception on patriarchy and their attitude towards keeping menstruation a secret topic. However, as already mentioned, the methods were not suitable to investigate the presence of patriarchal structures in the students’ home in an ethical way. Furthermore, for the sake of time efficiency of the survey and anonymity of the students only few socio-demographic questions were included. This, and making sure the students are not identifiable by their answers, were the reasons for including only few socio-demographic variables. However, some of them could have been exhausted more if the scope of the study would have allowed it. It could for instance be that a female older sibling or if someone menstruates already or not, influences the participants answer regarding the different study variables.

Another limitation is the generalisability due to the regional scope, as well as the sampling strategy. Although the sample size was respectable large for the limited resources and random sampling stages were included the sampling strategy; the sample size and randomness are still two of many factors that limit the representativity of the sample as already discussed in the method section. Furthermore, the in-school design can be criticised for not highlighting the situation of the out-of-school youth, being a particular vulnerable group that did not receive enough scholarly attention in menstruation studies yet (Hennegan & Montgomery, 2016; Sumpter & Torondel, 2013). However, based on the limited time and resources of this study, recruitment outside of schools was not feasible.

6.2.2.2. On the field. The time in classrooms was limited. Although the students did have enough time to finish the questionnaire, they maybe did feel that the research team was aware of the time and on some occasions teachers or other students were waiting for the study to be finished. Feeling some sort of time pressure is not ideal for answering questions that are presented to someone for the first time.

During the survey, me the master student and the local partner were present, which could have had potential for an examiner effect even though anonymity of the questionnaire was ensured (in development research the presence of a global north researcher is also critically discussed, however based on limited financial resources I needed to be there to help with handing out and collecting all the material needed for the survey). The fact that a research team comes into the classroom to ask questions about menstruation could indicate that they themselves have a rather open and positive attitude towards menstruation. A social-desirability bias for the questions about menstruation attitude can therefore not be ruled out. This is also the case for the questions about patriarchal beliefs as the research team consisted of women and did have an authority moment in the class as the students were asked to listen and follow the requests. Another aspect of the examiner effect could be that the questionnaire was conducted in a classroom setting. Although it was stressed that this was not a test, it is possible that students were careful about giving incorrect answers in the knowledge section. In fact, the results showed a small but still notable amount of the knowledge questions being *I do not know* replies. Those replies were merged together with incorrect answers (both did not add to the total score) when creating sum-scores, which was

due to practical reasons and aligned with the procedure of the original study (Benshaul-Tolonen et al., 2020). However, this procedure simplified the response structure of the students to a certain extent and can be seen as limiting the informative value of the knowledge section.

6.2.2.3 The data. The assessment of the applicability of scales was one of the objectives in this study. Therefore, the finding of a non-ideal fit of the measurements was an important and valuable insight, particularly because extraction and adjustments could improve the scales. However, the non-ideal fits measurements affected the further analysis of the relationships between the study variables, which can be seen as limiting the informative potential of the study. The scales, except for the knowledge scale, have been translated to Kiswahili for the first time for this study. While translating scales in different languages is progressive and can be seen as a contribution to the question of applicability of a scale, it inherits the risk of language barriers. It is possible that this has influenced the imperfect fits. A pre-study would have helped to investigate such weaknesses of the measurements before. This in turn could have increased the reliability and accuracy of the measurements in order to investigate possible relationships between the study variables most effectively.

6.2.3 Strengths of the study

The strength of this study lies first and foremost in the novel conceptualisation of setting the concept of SDO in relation to the attitude towards menstruation and also comparing that to knowledge. This responded to firstly, the fact that quantitative menstruation research in LMIC have a strong focus on knowledge about menstruation, while qualitative research in this field explored the crucial role of the socio-cultural context including patriarchal structures for the topic of menstruation (Hennegan et al., 2019; Hennegan & Montgomery, 2016). Using this approach in the study, responded to that claim and enabled to examine whether the relationship of patriarchal ideas and the attitude towards menstruation could be quantifiably confirmed. This is interesting, relevant and the first time it has done so in Tanzania.

Additionally, it was the first time SDT and SDO has been applied in the menstruation context, to the knowledge of the author. This can be seen as a valiant and innovative attempt to explore the radius of relevance and applicability of this theory and its empirical

operationalisation The detailed examination of this scale for children but also the BATM-S scale and the knowledge questions for their applicability and general structure can be seen as another strong aspect of the study. This enabled the formulation of recommendations for possible extractions and improvements of the scales, which is particularly worth emphasising as a contribution to the field.

Finally, the study had a respectably large sample size for a master thesis that enabled elaborated analyses. Further, it included boys in the sample and recruited participants from rural and urban school which can be seen as a valuable effort to investigate this topic under the consideration of different backgrounds within the study context.

6.3. Recommendations for future research

The measurement models of BATM-S and SDO-E should continue to be tested by further studies. Based on the results of this study, the use of the use of the SDO scale can partially be recommended, the short scale of the anti-egalitarianism SDO-E dimension of it showed good applicability. This is similar to the conclusion of the validation study of Cadamuro and colleagues (2020), who recommended the use of the short (complete) version over the long version. The use of BATM-S can be recommended for future studies that are interested in the norm to keep menstruation a secret. However, the reverse phrased items should be revised seeing that they had a strong covariance with each other. Attention should be paid to context specificity depending on where the study is conducted. The knowledge scale can also be recommended for use, although the ovulation questions need special consideration based on the context.

Future studies could also consider a more fluid gender scale instead of binary sex to be more inclusive. Further would a format in which participants could express their degree of group identification or belonging to gender identity enable a more nuanced analysis. As Aranda et al. (2015) found that not the sex itself but the strength of identification with a gender identity influenced their support for dominant views. Additionally, the inclusion of more socio-demographic characteristics could be encouraged to capture the socio-cultural context of participants better and possibly find effects on the attitude towards menstruation by variables that go beyond the conceptualisation of this study.

This study has already shown that the extension of the target group to boys provides interesting and important results and is therefore an example for future research. Furthermore, it would be interesting to investigate the associations of the attitude towards menstruation with patriarchal beliefs and knowledge about menstruation even further. Most of menstruation research focuses on adolescent girls (Bobel, 2019), however the experience and attitudes of adult women and men are relevant as well. On the one hand out of intrinsic interest and on the other because of their significant influence on adolescents' life in roles such as teachers, policy makers and parents (Chandra-Mouli & Patel, 2020; Erchull, 2020; Sommer, 2010a). One study that is underway in Tanzania acknowledges this complex social reality in which the menstrual experience is embedded in. According to their protocol, PASS MHW addresses multiple levels in communities in their longitudinal intervention study, including parents, school staff, political instances and students themselves (Okello et al., 2022). The study design also includes a cooperation with practitioners, namely the NGO femme international in Mwanza, which is one of the few NGOs concerned with menstruation that recognise the important role of boys (Bobel, 2019). Although the results are not published yet, the study states a promising example. This holistic approach responds to what scholars in the menstruation field have defined as a future direction for research and practice (Olson et al., 2022), which is also underscored by the found association between patriarchal beliefs (being a socio-cultural element) and the attitude towards menstruation in this study.

Secondly, research with different age groups or a longitudinal study would be interesting in order to see whether the attitude towards menstruation or patriarchal beliefs become weaker or stronger with advancing age. Men reported that the contact with menstruation through their romantic partner changed their attitude towards menstruation positively (Erchull, 2020; Eyring et al., 2023; Peranovic & Bentley, 2017) aligning with the contact hypothesis (Allport et al., 1954). Furthermore, Eyring et al. (2023) made a prognosis on different age groups based on their observed relationship between sexist views and menstruation stigma. They stated that with the generally observed decline of sexist views in younger generations a related decrease of the menstruation stigma can be expected. This prognosis needs more scientific investigation but points out the importance of the dimension

of age. Finally, mixed methods would allow a more in-depth exploration of patriarchal beliefs and the norm of keeping menstruation secret.

6.4 Implications for practice

The implication of this study for practice builds on the observed relationship between patriarchal beliefs and attitude towards menstruation. Both of these concepts are attitudes, which are of tendential nature, meaning that they can be changed depending on what a person receives as input (Eagly & Chaiken, 1993). This tendential nature allows optimism and opens the discussions for the question of how to implement this finding into practice. The implication of the observed association in this study is in line with previous research and theory entails that the aspirations to break the stigma among the adolescents needs to be extended in two directions: in scope and reach.

Firstly, the school curriculum or projects facilitated by NGOs need to go beyond information on MHM and the provision of menstrual products– they need to be complemented by a discussion of gender equality and how that tangents menstruation stigma (Olson et al., 2022). Talking with students about power-relations between men and women and how these manifests in menstruation could in turn help to raise general awareness and challenge these power relations by its roots and create a desirable spill-over effect to further issues related to gender inequality. Secondly, the reach of those projects (as well as research, as discussed above) needs to be expanded to a multi-level approach agreeing with other scholars who explored how to break the stigma (Okello et al., 2022; Olson et al., 2022; Rao et al., 2019). This study highlighted the relevance of socio-cultural influences on the menstruation stigma. Parents, teachers, school nurses and other agents need to be involved in the case of dismantling stigma. In previous research, these actors have shown to have a significant influence on the discourse in families, hold or share information, actively exemplify norms (Chandra-Mouli & Patel, 2020; Erchull, 2020; Sommer, 2010a) and in turn can prevent harmful behaviour such as period teasing and accommodate spaces for menstruating girls.

Finally, urges the significant knowledge difference between girls and boys to target boys more in curricular or external education sessions. Previous research showed that boys in Tanzania do not receive an equal amount of information about menstruation and general sex education compared girls in Tanzania neither at home nor in school (Guya et al. 2014;

Sommer, 2010b). While based on this study no conclusion can be drawn on the effectiveness of increased knowledge of boys on their attitude to the secrecy norm of menstruation; there is an intrinsic value in boys being informed about all the issues involved in puberty and growing up.

6.5 Conclusion

The main objective of this study was to investigate the attitude towards menstruation and compare its relationship with patriarchal beliefs and knowledge among both male and female students. This objective aimed to recognise the challenging circumstances of menstruating schoolgirls in Tanzania but not isolate it as an issue that only concerns those girls. Instead, the objective was an attempt to redirect the sole focus on girls and lift it to a socio-cultural level in the light of power-relations along the lines of the following questions: Who plans school facilities and schedules that do not accommodate MHM practices? Who has financial power in families to decide whether pain medication or period products is purchased? Whose remark on blood stains is the most feared? It is not the girls. Instead, it is men and in some cases boys. That men hold the vast power in multiple spheres is true for Tanzania (UNDP, 2023) and could have made the found relationship between patriarchal beliefs and the attitude to keep menstruation a secret salient but also highly relevant for the Tanzanian context. However, an uneven distribution of power between men and women remains as the reality for every single country in the world to a certain degree (UNDP, 2023). Similarly persistent and universal is the secrecy around menstruation (Sommer, 2010b). Therefore, the question of the influence of patriarchal beliefs on the attitude towards menstruation is relevant and should be asked beyond the Tanzanian context.

The observed association between patriarchal beliefs and the support for secrecy aligns with the previously introduced idea that the way society responds to menstruation corresponds to the general position of women and girls in society (Johnston-Robledo & Chrisler, 2013; Kissling, 1996; McHugh, 2020). Highlighting patriarchal structures and their influence on the menstrual experiences is an essential step to subsequently address them and ultimately master a holistic change that allows menstruation space in society. That this study could quantifiably confirm an association of patriarchal beliefs and the attitude to keep menstruation a secret among female and male students in Tanzania, even though with a small

effect, contributed to this essential step. Eventually contributed this finding to the field of critical menstruation studies, development studies and feminist analysis. The relevant scales used for the study have been thoroughly assessed and recommendations about them have been formulated. This which will encourage further use of the scales in future studies, which is needed to strengthen the evidence found in this study.

Although comparing the two associations of both knowledge and patriarchal beliefs with the attitude towards keeping menstruation a secret was not successful, additional findings regarding the knowledge about menstruation are of relevance. Firstly, boys had significantly lower knowledge than girls. This finding encourages, together with earlier research that showed that the silence of menstruation also concerns the information boys receive about it (Guya et al. 2014; Sommer, 2010b), to include boys more in educational sessions. This could still be conducted in segregated groups, if girls prefer, but boys should have the chance to be equally as informed as girls. Secondly, a high amount of knowledge correlated with a high support to statements saying menstruation should be kept secret. While this could not be investigated in-depth in further analysis it challenged the view that any education or knowledge about menstruation automatically degrades its stigma. On the contrary, it could even contribute as suggested by other scholars before (Olson et al., 2022). This unexpected correlational direction between knowledge and the attitude towards keeping menstruation a secret together with the found relationship between patriarchal beliefs and the secrecy attitude and lastly the observed knowledge difference between boys and girls lead to the following conclusion. Educational aspirations should be inclusive and be evaluated for their potential to either tackle or foster the stigma around menstruation and eventually gender equality.

To conclude more broadly, menstruation is an important issue as it concerns half of the population in reproductive age, who deserve to menstruate as comfortable, safe, and confident as possible. The growing attention and action around menstruation are therefore remarkably positive. However, menstruation is also a complex and socio-cultural issue, for which there is probably no simple and quick solution. Instead, the complexity and interconnectedness with society and power must be recognised and continue to be researched and discussed.

VII References

- About, F. E. (2003). The formation of in-group favoritism and out-group prejudice in young children: Are they distinct attitudes? *Developmental Psychology, 39*(1), 48.
- Allen, K. R., Kaestle, C. E., & Goldberg, A. E. (2011). More than just a punctuation mark: How boys and young men learn about menstruation. *Journal of Family Issues, 32*(2), 129–156.
- Allport, G. W., Clark, K., & Pettigrew, T. (1954). *The nature of prejudice*.
- Amiot, C. E., & Bourhis, R. Y. (2005). Ideological beliefs as determinants of discrimination in positive and negative outcome distributions. *European Journal of Social Psychology, 35*(5), 581–598.
- Aranda, M., Montes-Berges, B., & Castillo-Mayén, M.-R. (2015). The social dominance orientation in adolescence: The role of gender identity and stereotypical male and female traits/La orientación a la dominancia social en la adolescencia: El papel de la identidad de género y los rasgos estereotípicos femeninos y masculinos. *Revista de Psicología Social, 30*(2), 241–263.
- Benshaul-Tolonen, A., Aguilar-Gomez, S., Heller Batzer, N., Cai, R., & Nyanza, E. C. (2020). Period teasing, stigma and knowledge: A survey of adolescent boys and girls in Northern Tanzania. *PloS One, 15*(10), e0239914.
- Bobel, C. (2010). *New blood: Third-wave feminism and the politics of menstruation*. Rutgers University Press.

- Bobel, C. (2019). *The managed body: Developing girls and menstrual health in the global South*. Springer.
- Bobel, C. (2020). Introduction: Menstruation as lens—Menstruation as opportunity. In C. Bobel, I.T. Winkler, B. Fahs, K.A. Hasson, E.A. Kissling, & T.A. Roberts (Eds.), *The Palgrave handbook of critical menstruation studies* (pp. 1-6). Palgrave.
- Bogner, K., & Landrock, U. (2016). Response biases in standardised surveys (Version 2.0). *GESIS Survey Guidelines*. GESIS - Leibnitz-Institut für Sozialwissenschaften.
- Boniphace, M., Matovelo, D., Laisser, R., Swai, H., Yohani, V., Tinka, S., Mwaikasu, L., Mercader, H., Brenner, J. L., & Mitchell, J. (2021). Men perspectives on attending antenatal care visits with their pregnant partners in Misungwi district, rural Tanzania: A qualitative study. *BMC Pregnancy and Childbirth*, 21(1), 1–8.
- Bourdieu, P. (1987). What makes a social class? On the theoretical and practical existence of groups. *Berkeley Journal of Sociology*, 32, 1–17.
- Bourdieu, P. (1990). *The logic of practice*. Stanford University Press.
- Brooks-Gunn, J., & Ruble, D. N. (1980). The menstrual attitude questionnaire. *Psychosomatic Medicine*, 42(5), 503–512.
- Cadamuro, A., Di Bernardo, G. A., Trifiletti, E., Bisagno, E., Shamloo, S. E., Faccini, M., & Vezzali, L. (2022). Social dominance orientation in children: The validation of the long and short version of the child SDO6 scale. *European Journal of Developmental Psychology*, 19(1), 145–157.

- Campbell, R., & Wasco, S. M. (2000). Feminist approaches to social science: Epistemological and methodological tenets. *American Journal of Community Psychology, 28*(6), 773–791.
- Cardoso, L. F., Scolese, A. M., Hamidaddin, A., & Gupta, J. (2021). Period poverty and mental health implications among college-aged women in the United States. *BMC Women's Health, 21*(1), 1–7.
- Chandra-Mouli, V., & Patel, S. V. (2020). Mapping the knowledge and understanding of menarche, menstrual hygiene and menstrual health among adolescent girls in low- and middle-income countries. In C. Bobel, I.T. Winkler, B. Fahs, K.A. Hasson, E.A. Kissling, & T.A. Roberts (Eds.), *The Palgrave handbook of critical menstruation studies* (pp. 609-636). Palgrave.
- Cheng, C.-Y., Yang, K., & Liou, S.-R. (2007). Taiwanese adolescents' gender differences in knowledge and attitudes towards menstruation. *Nursing & Health Sciences, 9*(2), 127–134.
- Cherenack, E. M., & Sikkema, K. J. (2022). Puberty-and menstruation-related stressors are associated with depression, anxiety, and reproductive tract infection symptoms among adolescent girls in Tanzania. *International Journal of Behavioral Medicine, 29*(2), 160–174.
- Chrisler, J. C., Gorman, J. A., Marván, M. L., & Johnston-Robledo, I. (2014). Ambivalent Sexism and Attitudes Toward Women in Different Stages of Reproductive Life: A Semantic, Cross-Cultural Approach. *Health Care for Women International, 35*(6), 634–657. <https://doi.org/10.1080/07399332.2012.740113>

- Christopher, A. N., & Wojda, M. R. (2008). Social dominance orientation, right-wing authoritarianism, sexism, and prejudice toward women in the workforce. *Psychology of Women Quarterly*, *32*(1), 65–73.
- Coast, E., Lattof, S. R., & Strong, J. (2019). Puberty and menstruation knowledge among young adolescents in low-and middle-income countries: A scoping review. *International Journal of Public Health*, *64*(2), 293–304.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Routledge.
- Connell, R. (2013). *Gender and power: Society, the person and sexual politics*. John Wiley & Sons.
- Connell, R., & Messerschmidt, J. W. (2005). Hegemonic masculinity: Rethinking the concept. *Gender & Society*, *19*(6), 829–859.
- Connell, R., & Pearse, R. (2015). *Gender: In world perspective* (3rd ed.). Polity.
- Costos, D., Ackerman, R., & Paradis, L. (2002). Recollections of menarche: Communication between mothers and daughters regarding menstruation. *Sex Roles*, *46*, 49–59.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, *16*(3), 297–334.
- Dambrun, M., Duarte, S., & Guimond, S. (2004). Why are men more likely to support group-based dominance than women? The mediating role of gender identification. *British Journal of Social Psychology*, *43*(2), 287–297.
- D'Exelle, B., & Ringdal, C. (2022). Women's use of family planning services: An experiment on the husband's involvement. *Journal of Development Economics*, *158*, 102915.

- Douglas, M. (2002). *Purity and danger: An analysis of concept of pollution and taboo* (Vol. 2). Psychology Press.
- Doyle, A. B., & Aboud, F. E. (1995). A longitudinal study of White children's racial prejudice as a social-cognitive development. *Merrill-Palmer Quarterly*, 41(2), 209–228.
- Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Harcourt Brace Jovanovich College publishers.
- Eagly, A. H., & Chaiken, S. (2007). The advantages of an inclusive definition of attitude. *Social Cognition*, 25(5), 582–602.
- Erchull, M. J. (2020). "You will find out when the time is right": Boys, men, and menstruation. In C. Bobel, I.T. Winkler, B. Fahs, K.A. Hasson, E.A. Kissling, & T.A. Roberts (Eds.), *The Palgrave handbook of critical menstruation studies* (pp. 395-407). Palgrave.
- Eyring, J., Crandall, A., & Magnusson, B. M. (2023). A Modified Menstrual Attitudes Scale: Heteronormative Attitudes, Sexism, and Attitudes Toward Menstruation in Male and Female Adults. *Archives of Sexual Behavior*, 1–13.
- Field, A. (2018). *Discovering statistics using IBM SPSS statistics (5th ed)*. Sage.
- Fisher, E., Mwaipopo, R., Mutagwaba, W., Nyange, D., & Yaron, G. (2009). "The ladder that sends us to wealth": Artisanal mining and poverty reduction in Tanzania. *Resources Policy*, 34(1-2), 32-38.
- Forbes, G. B., Adams-Curtis, L. E., White, K. B., & Holmgren, K. M. (2003). The role of hostile and benevolent sexism in women's and men's perceptions of the menstruating woman. *Psychology of Women Quarterly*, 27(1), 58–63.

- Fox, J., & Tang, W. Y. (2014). Sexism in online video games: The role of conformity to masculine norms and social dominance orientation. *Computers in Human Behavior*, 33, 314–320.
- Grosz, E. (1994). *Volatile bodies: Toward a corporeal feminism*. Indiana University Press.
- Guya, E., Mayo, A. W., & Kimwag, R. (2014). Menstrual hygiene management in secondary schools in Tanzania. *Int J Sci Technol*, 3, 47–61.
- Hennegan, J., Dolan, C., Wu, M., Scott, L., & Montgomery, P. (2016). Measuring the prevalence and impact of poor menstrual hygiene management: A quantitative survey of schoolgirls in rural Uganda. *BMJ Open*, 6(12), e012596.
- Hennegan, J., & Montgomery, P. (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*, 11(2), e0146985.
- Hennegan, J., Shannon, A. K., Rubli, J., Schwab, K. J., & Melendez-Torres, G. J. (2019). Women's and girls' experiences of menstruation in low-and middle-income countries: A systematic review and qualitative metasynthesis. *PLoS Medicine*, 16(5), e1002803.
- Hennegan, J., Winkler, I. T., Bobel, C., Keiser, D., Hampton, J., Larsson, G., Chandra-Mouli, V., Plesons, M., & Mahon, T. (2021). Menstrual health: A definition for policy, practice, and research. *Sexual and Reproductive Health Matters*, 29(1), 31–38.
- Henry, G. T. (1990). *Practical sampling* (Vol. 21). Sage.
- Ho, A. K., Sidanius, J., Kteily, N., Sheehy-Skeffington, J., Pratto, F., Henkel, K. E., Foels, R., & Stewart, A. L. (2015). The nature of social dominance orientation: Theorizing and

- measuring preferences for intergroup inequality using the new SDO₇ scale. *Journal of Personality and Social Psychology*, 109(6), 1003.
- Holmes, K., Curry, C., Sherry, Ferfolja, T., Parry, K., Smith, C., Hyman, M., & Armour, M. (2021). Adolescent menstrual health literacy in low, middle and high-income countries: A narrative review. *International Journal of Environmental Research and Public Health*, 18(5), 2260.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1–55.
- IBM Corp. (2020). IBM SPSS Statistics for Windows (Version 27.0). [Computer software].
- Jagayat, A., & Choma, B. L. (2021). Cyber-aggression towards women: Measurement and psychological predictors in gaming communities. *Computers in Human Behavior*, 120, 106753.
- Jakobsen, H. (2014). What's gendered about gender-based violence? An empirically grounded theoretical exploration from Tanzania. *Gender & Society*, 28(4), 537–561.
- Jakobsen, H. (2018). How violence constitutes order: Consent, coercion, and censure in Tanzania. *Violence against Women*, 24(1), 45–65.
- Johnston-Robledo, I., & Chrisler, J. C. (2013). The menstrual mark: Menstruation as social stigma. *Sex Roles*, 68(1–2), 9–18.
- Kansiime, C., Hytti, L., Nalugya, R., Nakuya, K., Namirembe, P., Nakalema, S., Neema, S., Tanton, C., Alezuyo, C., & Musoke, S. N. (2020). Menstrual health intervention and

- school attendance in Uganda (MENISCUS-2): A pilot intervention study. *BMJ Open*, *10*(2), e031182.
- Kelly, A. J., Dubbs, S. L., & Barlow, F. K. (2015). Social dominance orientation predicts heterosexual men's adverse reactions to romantic rejection. *Archives of Sexual Behavior*, *44*, 903–919.
- Kimeu, C. (2023, February 20). Kenyan senator targeted by online threats after period poverty protest. *The Guardian: Europe Edition*. <https://www.theguardian.com/global-development/2023/feb/20/kenyan-senator-gloria-orwoba-online-threats-period-poverty-protest>
- Kissling, E. A. (1996). Bleeding out loud: Communication about menstruation. *Feminism & Psychology*, *6*(4), 481–504.
- Kitzinger, C. (2005). Heteronormativity in action: Reproducing the heterosexual nuclear family in after-hours medical calls. *Social Problems*, *52*(4), 477–498.
- Kline, R. B. (2023). *Principles and practice of structural equation modeling*. Guilford Publications.
- Kyriazos, T. A. (2018). Applied psychometrics: Sample size and sample power considerations in factor analysis (EFA, CFA) and SEM in general. *Psychology*, *9*(08), 2207.
- Leavens, M. K., Gugerty, M. K., & Anderson, C. L. (2019). Gender and agriculture in Tanzania. *Gates Open Res*, *3*(1348), 1348.
- Link, B. G., & Phelan, J. (2014). Stigma power. *Social Science & Medicine*, *103*, 24–32.
- Longhurst, R. (2001). *Bodies: Exploring fluid boundaries*. Psychology Press.

- MacLean, K., Hearle, C., & Ruwanpura, K. (2020). Stigma of staining? Negotiating menstrual taboos amongst young women in Kenya. *Women's Studies International Forum*, 78, 1-10.
- Mandalaywala, T. M., Tai, C., & Rhodes, M. (2020). Children's use of race and gender as cues to social status. *PloS One*, 15(6), e0234398.
- Mahajan, A. P., Sayles, J. N., Patel, V. A., Remien, R. H., Sawires, S. R., Ortiz, D. J., Szekeres, G., & Coates, T. J. (2008). Stigma in the HIV/AIDS epidemic: A review of the literature and recommendations for the way forward. *Aids*, 22, S67–S79.
- Marván, M. L., Ramírez-Esparza, D., Cortés-Iniestra, S., & Chrisler, J. C. (2006). Development of a new scale to measure beliefs about and attitudes toward menstruation (BATM): Data from Mexico and the United States. *Health Care for Women International*, 27(5), 453–473.
- McHugh, M. C. (2020). Menstrual shame: Exploring the role of 'menstrual moaning'. In C. Bobel, I.T. Winkler, B. Fahs, K.A. Hasson, E.A. Kissling, & T.A. Roberts (Eds.), *The Palgrave handbook of critical menstruation studies* (pp. 409-422). Palgrave.
- Messerschmidt, J. W. (2019). The salience of "hegemonic masculinity". *Men and Masculinities*, 22(1), 85–91.
- Neuman, L., W. (2014). *Social research methods: Qualitative and quantitative approaches* (7th ed.). Pearson.
- Okello, E., Rubli, J., Torondel, B., Makata, K., Ayieko, P., Kapiga, S., Greco, G., & Renju, J. (2022). Co-development and piloting of a menstrual, sexual and reproductive health

- intervention to improve social and psychological outcomes among secondary schoolgirls in Northern Tanzania: The PASS MHW study protocol. *BMJ Open*, *12*(2), e054860.
- Olson, M. M., Alhelou, N., Kavattur, P. S., Rountree, L., & Winkler, I. T. (2022). The persistent power of stigma: A critical review of policy initiatives to break the menstrual silence and advance menstrual literacy. *PLOS Global Public Health*, *2*(7), e0000070.
- Papersurvey.io. (2023). Papersurvey.io. [Computer software].
- Pallant, J. (2020). *SPSS survival manual: A step by step guide to data analysis using IBM SPSS*. Routledge.
- Peranovic, T., & Bentley, B. (2017). Men and menstruation: A qualitative exploration of beliefs, attitudes and experiences. *Sex Roles*, *77*, 113–124.
- Perez, C. C. (2019). *Invisible women: Exposing data bias in a world designed for men*. Random House.
- Persdotter, J. (2020). Introducing menstrunormativity: Toward a complex understanding of ‘menstrual monsterings’. In C. Bobel, I.T. Winkler, B. Fahs, K.A. Hasson, E.A. Kissling, & T.A. Roberts (Eds.), *The Palgrave handbook of critical menstruation studies* (pp. 357-373). Palgrave.
- Phelan, J. C., Link, B. G., & Dovidio, J. F. (2008). Stigma and prejudice: One animal or two? *Social Science & Medicine*, *67*(3), 358–367.

- Phillips-Howard, P. A., Caruso, B., Torondel, B., Zulaika, G., Sahin, M., & Sommer, M. (2016). Menstrual hygiene management among adolescent schoolgirls in low-and middle-income countries: Research priorities. *Global Health Action, 9*(1), 33032.
- Plesons, M., Patkar, A., Babb, J., Balapitiya, A., Carson, F., Caruso, B. A., Franco, M., Hansen, M. M., Haver, J., & Jahangir, A. (2021). The state of adolescent menstrual health in low-and middle-income countries and suggestions for future action and research. *Reproductive Health, 18*, 1–13.
- Pratto, F., Sidanius, J., & Levin, S. (2006). Social dominance theory and the dynamics of intergroup relations: Taking stock and looking forward. *European Review of Social Psychology, 17*(1), 271–320.
- Pratto, F., Sidanius, J., Stallworth, L. M., & Malle, B. F. (1994). Social dominance orientation: A personality variable predicting social and political attitudes. *Journal of Personality and Social Psychology, 67*(4), 741.
- Punch, K. F. (2014). *Social research: Quantitative & qualitative approaches* (3rd ed.). Sage.
- Raabe, T., & Beelmann, A. (2011). Development of ethnic, racial, and national prejudice in childhood and adolescence: A multinational meta-analysis of age differences. *Child Development, 82*(6), 1715–1737.
- Rao, D., Elshafei, A., Nguyen, M., Hatzenbuehler, M. L., Frey, S., & Go, V. F. (2019). A systematic review of multi-level stigma interventions: State of the science and future directions. *BMC Medicine, 17*(1), 1–11.

- Reifen-Tagar, M., & Saguy, T. (2021). Early sociopolitical development matters for inequality: SDO and the gender gap in leadership. *Psychological Inquiry*, 32(2), 124–130.
- Roberts, T., Goldenberg, J. L., Power, C., & Pyszczynski, T. (2002). “Feminine protection”: The effects of menstruation on attitudes towards women. *Psychology of Women Quarterly*, 26(2), 131–139.
- Rojita, A. (2023, August 11). Teenage girl dies after being forced to stay in a ‘period hut’ in Nepal. *The Guardian: Europe Edition*. <https://www.theguardian.com/global-development/2023/aug/11/teenage-girl-dies-after-being-forced-to-stay-in-a-period-hut-in-nepal>
- Rollero, C., Bergagna, E., & Tartaglia, S. (2021). What is violence? The role of sexism and social dominance orientation in recognizing violence against women. *Journal of Interpersonal Violence*, 36(21–22), NP11349–NP11366.
- RStudio Core Team. (2023). RStudio: Integrated Development Environment for R (Version 4.3.2).[Computer Software].
- Rydström, K. (2020). Degendering menstruation: Making trans menstruators matter. In C. Bobel, I.T. Winkler, B. Fahs, K.A. Hasson, E.A. Kissling, & T.A. Roberts (Eds.), *The Palgrave handbook of critical menstruation studies* (pp. 945-959). Palgrave.
- Shannon, A. K., Melendez-Torres, G., & Hennegan, J. (2021). How do women and girls experience menstrual health interventions in low-and middle-income countries? Insights from a systematic review and qualitative metasynthesis. *Culture, Health & Sexuality*, 23(5), 624–643.

- Sibley, C. G., Wilson, M. S., & Duckitt, J. (2007). Antecedents of men's hostile and benevolent sexism: The dual roles of social dominance orientation and right-wing authoritarianism. *Personality and Social Psychology Bulletin*, 33(2), 160–172.
- Sidanius, J., & Pratto, F. (2001). *Social dominance: An intergroup theory of social hierarchy and oppression*. Cambridge University Press.
- Sommer, M. (2009). Ideologies of sexuality, menstruation and risk: Girls' experiences of puberty and schooling in northern Tanzania. *Culture, Health & Sexuality*, 11(4), 383–398.
- Sommer, M. (2010a). Putting menstrual hygiene management on to the school water and sanitation agenda. *Waterlines*, 268–278.
- Sommer, M. (2010b). Where the education system and women's bodies collide: The social and health impact of girls' experiences of menstruation and schooling in Tanzania. *Journal of Adolescence*, 33(4), 521–529.
- Sommer, M. (2013). Structural factors influencing menstruating school girls' health and well-being in Tanzania. *Compare: A Journal of Comparative and International Education*, 43(3), 323–345.
- Sommer, M., Ackatia-Armah, N., Connolly, S., & Smiles, D. (2015). A comparison of the menstruation and education experiences of girls in Tanzania, Ghana, Cambodia and Ethiopia. *Compare: A Journal of Comparative and International Education*, 45(4), 589–609.
- Soper, D.S. (2023). A-priori Sample Size Calculator for Structural Equation Models [Software].

- Steinem, G. (2019). If men could menstruate. *Women's Reproductive Health*, 6(3), 151-152.
- Sumpter, C., & Torondel, B. (2013). A systematic review of the health and social effects of menstrual hygiene management. *PloS One*, 8(4), e62004.
- Szekeres, H., Shuman, E., & Saguy, T. (2020). Views of sexual assault following# MeToo: The role of gender and individual differences. *Personality and Individual Differences*, 166, 110203.
- Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2007). *Using multivariate statistics (Vol. 5)*. Pearson.
- Tao, S. (2019). Female teachers in Tanzania: An analysis of gender, poverty and constrained capabilities. *Gender and Education*, 31(7), 903–919.
- The United Republic of Tanzania (URT). Ministry of Finance and Planning, Tanzania National Bureau of Statistics and President's Office - Finance and Planning, & Office of the Chief Government Statistician Zanzibar. (2022). *The 2022 population and housing census: Administrative units population distribution report Tanzania mainland*. <https://sensa.nbs.go.tz/publication/volume1c.pdf>
- United Nations Development Programme (UNDP), United Nations Entity for Gender Equality, & the Empowerment of Women (UN WOMEN). (2023). *The paths to equal: Twin indices on women's empowerment and gender equality*. <https://hdr.undp.org/content/paths-equal>

United Nations Development Programme (UNDP). (2022). Human development report.

https://hdr.undp.org/system/files/documents/global-report-document/hdr2021-22pdf_1.pdf

Vezzali, L., Di Bernardo, G. A., Stathi, S., Cadamuro, A., Láštíková, B., & Andraščíková, S.

(2018). Secondary transfer effect among children: The role of social dominance orientation and outgroup attitudes. *British Journal of Social Psychology*, 57(3), 547–566.

Weijters, B., & Baumgartner, H. (2012). Misresponse to reversed and negated items in

surveys: A review. *Journal of Marketing Research*, 49(5), 737–747.

Weiss-Wolf, J. (2020). US policymaking to address menstruation: Advancing an equity

agenda. In C. Bobel, I.T. Winkler, B. Fahs, K.A. Hasson, E.A. Kissling, & T.A. Roberts (Eds.), *The Palgrave handbook of critical menstruation studies* (pp. 539-549).

Palgrave.

Whitworth, H. S., Baisley, K. J., Nnko, S., Irani, J., Aguirre-Beltran, A., Changalucha, J., Crucitti,

T., Francis, S., Hashim, R., & Hansen, C. H. (2023). Associations between age of menarche, early sexual debut and high-risk sexual behaviour among urban Tanzanian schoolgirls: A cross-sectional study. *Tropical Medicine & International Health*, 28(3), 237–246.

Wigginton, B., & Lafrance, M. N. (2019). Learning critical feminist research: A brief

introduction to feminist epistemologies and methodologies. *Feminism & Psychology*, 1-17.

- Winkler, I. T. (2020). Introduction: Menstruation as fundamental. In C. Bobel, I.T. Winkler, B. Fahs, K.A. Hasson, E.A. Kissling, & T.A. Roberts (Eds.), *The Palgrave handbook of critical menstruation studies* (pp. 9-13). Palgrave.
- Wong, W. C., Li, M. K., Chan, W. Y. V., Choi, Y. Y., Fong, C. H. S., Lam, K. W. K., Sham, W. C., So, P. P., Wong, K., & Yeung, K. H. (2013). A cross-sectional study of the beliefs and attitudes towards menstruation of Chinese undergraduate males and females in Hong Kong. *Journal of Clinical Nursing*, 22(23–24), 3320–3327.
- Wood, J. M. (2020). (In) visible bleeding: The menstrual concealment imperative. In C. Bobel, I.T. Winkler, B. Fahs, K.A. Hasson, E.A. Kissling, & T.A. Roberts (Eds.), *The Palgrave handbook of critical menstruation studies* (pp. 310-336). Palgrave.
- World Health Organization (WHO). (2019). *Adolescent health*. https://www.who.int/health-topics/adolescent-health#tab=tab_1
- Yilmaz, K. (2013). Comparison of quantitative and qualitative research traditions: Epistemological, theoretical, and methodological differences. *European Journal of Education*, 48(2), 311–325.

Appendices

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Appendix A

Questionnaire

CODE 0

Please tick the number that the assistant will tell you. (The number will tell us, on which day of our study this answer sheet got filled out). *(select one)*

 1 2 3 4 5

I OPINION ABOUT MENSTRUATION

Please answer the questions, by ticking **ONLY ONE** box. This is not a school test and is not graded. Your teacher will not see what you answered. There are no right or wrong answers. This is just about your opinion.

M1: It is important that women talk about the menstrual period with men *(select one)*

 Strongly disagree -- Disagree -- Somewhat disagree - Somewhat agree + Agree ++ Strongly agree +++

M2: It is important to discuss the topic of the period at school with boys and girls together *(select one)*

 Strongly disagree -- Disagree -- Somewhat disagree - Somewhat agree + Agree ++ Strongly agree +++

M3: Women must hide anything that shows that they are having their periods *(select one)*

 Strongly disagree -- Disagree -- Somewhat disagree - Somewhat agree + Agree ++ Strongly agree +++

M4: It is important that women buy sanitary pads without being seen *(select one)*

 Strongly disagree -- Disagree -- Somewhat disagree - Somewhat agree + Agree ++ Strongly agree +++

M5: It is uncomfortable to talk about the period *(select one)*

 Strongly disagree -- Disagree -- Somewhat disagree - Somewhat agree + Agree ++ Strongly agree +++

M6: It is important that nobody knows when a woman is having her period *(select one)*

 Strongly disagree -- Disagree -- Somewhat disagree - Somewhat agree + Agree ++ Strongly agree +++

M7: It is embarrassing when a man finds out that a woman is having her period *(select one)*

 Strongly disagree -- Disagree -- Somewhat disagree - Somewhat agree + Agree ++ Strongly agree +++

To respond or



JY33 0001

M8: People feel uncomfortable when they see an advertisement about sanitary pads when being in company with the other gender (select one)

- Strongly disagree -- Disagree -- Somewhat disagree - Somewhat agree + Agree ++ Strongly agree +++

M9: It is important to keep the period a secret (select one)

- Strongly disagree -- Disagree -- Somewhat disagree - Somewhat agree + Agree ++ Strongly agree +++

M10: Women should avoid talking about their periods when there are men present (select one)

- Strongly disagree -- Disagree -- Somewhat disagree - Somewhat agree + Agree ++ Strongly agree +++

M11: It is important to discuss the topic of the period at home openly (select one)

- Strongly disagree -- Disagree -- Somewhat disagree - Somewhat agree + Agree ++ Strongly agree +++

M12: Women must stay away from men while they are having their periods (select one)

- Strongly disagree -- Disagree -- Somewhat disagree - Somewhat agree + Agree ++ Strongly agree +++

II FACTS ABOUT MENSTRUATION

Please select the correct answer. Please select only ONE. This is not a school test and is not graded. Your teacher will not see what you answered. If you do not know the answer, select the answer that you think is most likely right.

K1: Approximately how often does a girl get her period? (select one)

- Once in her life Once every year
 Every week Every month

K2: How long does a menstrual period last on average? (select one)

- one hour one day a few days two weeks all the time

Please select Yes or No to indicate if the following statements are true.

K3: When a girl reaches menarches (her first menstruation), it means she could get pregnant if she has sex. (select one)

- Yes No I do not know



15

To respond or



JY33 0002

K4: Menstrual period indicates a woman is not pregnant

(select one)

Yes

No

I do not know

K5: Ovulation happens on average 14 days before period.

(select one)

Yes

No

I do not know

K6: Ovulation happens during period

(select one)

Yes

No

I do not know

K7: Is it common for girls to have physical discomfort when they have their period?

(select one)

Yes

No

I do not know

III OPINION ABOUT GROUPS

The following questions are related to groups and how they interact and live together. When you answer the questions please think about MEN AND WOMEN and how you think they should live together. Please answer the questions by ticking ONLY ONE BOX. This is not a school test and will not be graded. Your teacher will not see what you answered. There are no right or wrong answers. This is all about your opinion.

D1: Should all people earn the same amount of money?

(select one)

Strongly disagree --

Disagree --

Somewhat disagree -

Somewhat agree +

Agree ++

Strongly agree +++

D2: Are some groups of people inferior to other groups?

(select one)

Strongly disagree --

Disagree --

Somewhat disagree -

Somewhat agree +

Agree ++

Strongly agree +++

D3: Would it be good if all groups were equal?

(select one)

Strongly disagree --

Disagree --

Somewhat disagree -

Somewhat agree +

Agree ++

Strongly agree +++

D4: In getting what people want, is it sometime necessary to use force?

(select one)

Strongly disagree --

Disagree --

Somewhat disagree -

Somewhat agree +

Agree ++

Strongly agree +++

D5: Would we have fewer problems if we treated people more fairly?

(select one)

Strongly disagree --

Disagree --

Somewhat disagree -

Somewhat agree +

Agree ++

Strongly agree +++



15

To respond or



JY33 0003

D6: Should some groups of people be kept in their place, in order to not create problems? *(select one)*

- Strongly disagree -- Disagree -- Somewhat disagree - Somewhat agree + Agree ++ Strongly agree +++

D7: Should equality between groups be increased? *(select one)*

- Strongly disagree -- Disagree -- Somewhat disagree - Somewhat agree+ Agree ++ Strongly agree+++

D8: Should some groups of people be forbidden from doing what they want? *(select one)*

- Strongly disagree -- Disagree -- Somewhat disagree - Somewhat agree + Agree ++ Strongly agree +++

D9: Should all groups be able to do the same things? *(select one)*

- Strongly disagree -- Disagree -- Somewhat disagree - Somewhat agree + Agree ++ Strongly agree +++

D10: Should no single group dictate in society? *(select one)*

- Strongly disagree -- Disagree -- Somewhat disagree - Somewhat agree+ Agree ++ Strongly agree +++

D11: Should all groups be equal? *(select one)*

- Strongly disagree -- Disagree -- Somewhat disagree - Somewhat agree+ Agree ++ Strongly agree +++

D12: To get ahead in life, is it sometime necessary "to step" on other groups? *(select one)*

- Strongly disagree -- Disagree -- Somewhat disagree - Somewhat agree + Agree ++ Strongly agree +++

D13: Should inferior groups stay in their place? *(select one)*

- Strongly disagree -- Disagree -- Somewhat disagree - Somewhat agree + Agree ++ Strongly agree +++

D14: Should we find a way to make the conditions between groups equal? *(select one)*

- Strongly disagree -- Disagree -- Somewhat disagree - Somewhat agree + Agree++ Strongly agree +++



15

To respond or



JY33 0004

D15: Is it fair that some groups are more worthy than others?

(select one)

- Strongly disagree -- Disagree -- Somewhat disagree - Somewhat agree + Agree ++ Strongly agree+++

D16: Is it fair that some groups have more chances in life than others?

(select one)

- Strongly disagree -- Disagree -- Somewhat disagree - Somewhat agree + Agree++ Strongly agree +++

IV QUESTIONS ABOUT YOURSELF

S1: How old are you?

Please write in good handwriting. Put one number in one box.

S2: In which month is your birthday?

(select one)

- January February March April May June July
 August September October November December I do not know

S3: What grade are you in?

(select one)

- Form 2 Form 3

S4: Who do you currently live with?

(select one)

- parents grandparents alone siblings
 Other family members boarding school boarding house/hostel other

S5: I am...

(select one)

- female male

S6: If you answered female, have you had your period yet?

(select one)

- Yes No I am a boy



15

To respond or



JY33 0005

0 CODE

Tafadhali weka alama kwenye nambari ambayo msaidizi atakuambia. (Nambari itatuambia, karatasi hii ya majibu imetoka siku gani ya utafiti wetu). (Chagua moja)

- 1 2 3 4 5

I MAONI KUHUSU HEDHI

Tafadhali jibu maswali yafuatayo, kwa kuweka alama kwenye kisanduku KIMOJA TU. Huu sio mthani hautawekwa alama/maksi. Mwalimu wako hataona ulichojibu. Hakuna majibu sahihi au yasiyo sahihi. Hii ni kuhusu maoni yako tu.

M1: Ni muhimu kwa wanawake kuzungumza juu ya kipindi cha hedhi na wanaume (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubaliana kabisa +++

M2: Ni muhimu wavulana na wasichana kwa pamoja kujadili mada inayohusu hedhi wawapo shuleni (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubaliana kabisa +++

M3: Wanawake lazima wafiche chochote kinachoonyesha kuwa wako kwenye hedhi (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubaliana kabisa +++

M4: Ni muhimu wanawake kununua pedi bila kuonekana (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubaliana kabisa +++

M5: Kuzungumza kuhusu hedhi ni aibu (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubaliana kabisa +++

M6: Ni muhimu kwamba hakuna mtu anayejua wakati mwanamke anapata hedhi (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubaliana kabisa +++



1

To respond or



79LQ 0001

M7: Inatia aibu mwanaume anapogundua kuwa mwanamke yuko kwenye hedhi/siku zake (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubaliana kabisa +++

M8: Watu huhisi aibu/wanakosa uhuru wanapoona tangazo kuhusu pedi wanapokuwa pamoja na jinsia nyingine. (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubaliana kabisa +++

M9: Ni muhimu hedhi kuwa jambo la siri (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubaliana kabisa +++

M10: Wanawake wanapaswa kuepuka kuzungumza juu ya hedhi zao wakati wanaume wapo (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubaliana kabisa +++

M11: Ni muhimu kujadili mada ya hedhi nyumbani kwa uwazi (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubaliana kabisa +++

M12: Wanawake lazima wakae mbali na wanaume wanapokuwa kwenye hedhi zao (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubaliana kabisa +++

II UKWELI KUHUSU HEDHI

Tafadhali chagua jibu sahihi. Tafadhali chagua jibu MOJA pekee. Huu sio mtihani wa shule na hautawekwa alama. Mwalimu wako hataona ulichojibu. Ikiwa hujui jibu, chagua jibu ambalo unafikiri ni sahihi zaidi.

K1: Kwa takribani/kukadiria msichana hupata hedhi mara ngap? (Chagua moja)

- Mara moja katika maisha yake Mara moja kwa mwaka
 Kila wiki Kila mwezi

K2: Je, hedhi huchukua muda gani kwa wastani? (Chagua moja)

- saa moja siku moja siku chache wiki mbili kila wakati

Tafadhali chagua Ndiyo au Hapana ili kuonyesha kama taarifa zifuatazo ni za kweli.



1

To respond or



79LQ0002

K3: Msichana anapoanza hedhi (hedhi yake ya kwanza), inamaanisha anaweza kupata mimba ikiwa atafanya ngono (Chagua moja)

- Ndiyo Hapana Sijui

K4: Kupata hedhi inaonyesha kuwa mwanamke si mjamzito (Chagua moja)

- Ndiyo Hapana Sijui

K5: Kupevuka kwa yai hutokea kwa wastani siku 14 kabla ya hedhi. (Chagua moja)

- Ndiyo Hapana Sijui

K6: Kupevushwa kwa yai hutokea wakati wa hedhi (Chagua moja)

- Ndiyo Hapana Sijui

K7: Je, ni kawaida kwa wasichana kupata usumbufu wa kimwili wanapokuwa kwenye hedhi zao? (Chagua moja)

- Ndiyo Hapana Sijui

III MAONI JUU YA VIKUNDI

Maswali yafuatayo yanahusiana na vikundi na jinsi wanavyoshirikiana na kuishi pamoja. Unapojibu maswali haya, tafadhali fikiria kuhusu WANAUME NA WANAWAKE na jinsi unavyofikiri wanapaswa kuishi kwa pamoja. Tafadhali jibu maswali kwa kuweka alama kwenye kisanduku KIMOJA TU. Huu sio mtihani wa shule na hautawekwa maksi/alama. Mwalimu wako hataona ulichojibu. Hakuna majibu sahihi au yasiyo sahihi. Haya yote ni kuhusu maoni yako.

D1: Je, watu wote wanapaswa kuwa na kipato sawa cha kifedha? (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubaliana kabisa +++

D2: Je, baadhi ya makundi ya watu ni duni kuliko makundi mengine? (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubaliana kabisa +++

D3: Je, ingekuwa vyema kama makundi yote ya watu yangekuwa na usawa? (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubaliana kabisa +++



1

To respond or



79LQ0003

D4: Katika kupata kile ambacho watu wanataka, je, wakati fulani ni muhimu kutumia nguvu? (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubaliana kabisa +++

D5: Je, kungekuwa na matatizo machache ikiwa tungewatendea watu kwa haki zaidi? (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubaliana kabisa +++

D6: Je, baadhi ya makundi ya watu kukaa mahali pao, ili yasilete matatizo? (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubaliana kabisa +++

D7: Je, usawa kati ya vikundi uongezwe? (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubaliana kabisa +++

D8: Je, baadhi ya vikundi vya watu vikatazwe kufanya vile wanavyotaka? (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubaliana kabisa +++

D9: Je, vikundi vyote viweze kufanya mambo sawa? (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubaliana kabisa +++

D10: Je, hakuna kundi moja linalopaswa kufanya maamuzi katika jamii? (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubaliana kabisa +++

D11: Je, makundi yote yanapaswa kuwa sawa? (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubaliana kabisa +++



1

To respond or



79LQ0004

D12: Ili kupata maendeleo maishani, je, ni lazima “kukanyaga”/ kuonea/ kukandamiza makundi mengine wakati fulani? (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubalina kabisa +++

D13: Je, makundi duni yanapaswa kukaa mahali pao/kutengwa? (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubalina kabisa +++

D14: Je, tutafute namna ya kufanya ili makundi yote ya watu yawe na usawa? (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubalina kabisa +++

D15: Je, ni haki kwamba makundi fulani yanastahili zaidi kuliko mengine? (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubalina kabisa +++

D16: Je, ni haki kwamba makundi fulani ya watu kuwa na nafasi/fursa zaidi maishani kuliko wengine? (Chagua moja)

- Sikubaliani kabisa --- Sikubaliani -- Sikubaliani kwa kiasi fulani - Nakubaliana kwa kiasi fulani + Nakubaliana ++ Nakubalina kabisa +++

IV TAARIFA BINAFSI

S1: Una miaka mingapi? Tafadhali andika kwa mwandiko mzuri, weka nambari moja kwenye kisanduku kimoja

S2: Siku yako ya kuzaliwa ni mwezi gani? (Chagua moja)

- Januari Februari Machi Aprili Mei Juni Julai
 Agosti Septemba Octoba Novemba Decemba Sijui

S3: Uko kidato cha ngapi? (Chagua moja)

- Kidatu cha pili Kidatu cha tatu



1

To respond or



79LQ 0005

Appendix B

Information and consent teacher



Social Dominance Orientation and attitude towards menstruation – the influence of patriarchal beliefs on the attitude towards menstruation among school students in Northern Tanzania

Information sheet

SCHOOL GUARDIANS – Head teachers/Head mistresses

Introduction

My name is Selina Rombach, I am a researcher from University of Bergen. I would like to inform you about our duties and your rights concerning our request for this school to participate in a study. We would kindly ask you to carefully read this document or listen as it is read out to you, to indicate if you agree to this school under your administration to participate in this study and to complete/sign this form.

You have been approached because _____ [insert the name of the school] is under your leadership and administration and has been selected to be part of the research project: Social Dominance Orientation and attitude towards menstruation -the influence of patriarchal beliefs on the attitude towards menstruation among school students in Northern Tanzania. The project aims to generate insights about the attitude towards menstruation and how it is influenced by knowledge about menstruation and the support for certain social structures. The purpose is to find out what stresses the psychosocial well-being of menstruating schoolgirls. The findings shall help to improve interventions and the situation for school girls in their education environment to foster optimal school participation and performance of secondary school girls.

Why and how is this study being done?

Poor menstrual health are associated with subsequent psychosocial (high levels of shame, depression, anxiety) and physical (pain, increased risk of reproductive and urinary tract infections) ill health which can lead to poor school outcomes (including poor performance, participation, and completion) for both girls and in a different way boys. This research projects focuses on the psychosocial well-being. It measures the attitude towards menstruation/support for taboisation of menstruation, knowledge about menstruation and the opinion of the student about societal structures between girls and boys (with the social dominance orientation scale). The research project is a paper-based questionnaire that will be conducted at one time. The completion of the questionnaire, including the introduction, signing of assent etc. should not take up more than two hours. By this, time that the students allocate to the study is kept as short as possible. The data collection is lead by the principal investigator and is assisted by a Swahili speaking assistant that will explain all information needed for the students and can help clarify questions during the completion of the questionnaire as well as any questions of organizational matter before and after.

The sample we are interested in are students of Form 2 - Form 3 (students under the age of 18) The sampling will follow academic guidelines. We will ask you for the list of streams of you classes in form 2 and form 3. We will then sample these streams and select only some of the streams to participate. (random sampling). We will invite all students belonging to the selected streams to participate in the study. The students will receive an anonymised



participant number. They will receive information about the study and their rights and will sign the assent form with their names. All students who gave their assent will stay in the room. The assent forms will be collected and stored safely but separated from the actual questionnaires. Afterwards they will receive the questionnaire on which they will write down their (anonymized) participant number and answer the questions. After the completion of the questionnaire, the study is finished at your school. No further time of you or your students is requested by the research team. If there are any further questions coming up after our visit we will gladly be available. It is our hope that our project improves menstrual and psychosocial well-being and perceptions as well as the school climate a whole to optimal school participation and performance of secondary school students.

Can I refuse this study to involve my school?

Yes, participation in this study is voluntary and as an authority in this school you are free to decide whether your school should take part in this study.

Can I stop my school's participation in the study?

Yes. You can decide to stop the involvement of your school at any time for any reason. The participant numbers will contain your school name and therefore can be deleted even after the data collection.

What is required of me if I let my school take part in this study?

If you agree for your school to participate in this study, I will ask you to provide written consent by signing this form on behalf of the students who will be participating in this study. Your consent will allow us to conduct the questionnaire survey within your school. We will also ask every participant who takes part to complete an assent (according to the legal guidelines for conducting research involving minors). Students should not feel any pressure to take part in any part of the study and will be able to refuse participation of this study.

What are the possible benefits of participating in this research?

Your school's participation contributes towards the production of important knowledge about the experience and opinion of menstruation of secondary school students and will have the effect of normalization of menstruation related topics for the students themselves. The insights that we hope to find will help to investigate needs of menstruating girls and space for improvements of school interventions about reproductive health and gender equality; in Mwanza region and beyond. In the long run, a participation in surveys like this fosters a positive school environment, equal school participation of all students enrolled and an improved psycho-social wellbeing at every day of the month. A completion of an academic questionnaire can also be a beneficial experience for students as it is an early contact with academic research and its practices.

What are the possible disadvantages of participating in this research?

The selected students that will participate in the study will need to allocate about 60 minutes for the questionnaire. The questionnaire does not contain questions about personal information nor any potential harmful content. All of the questions asked in the questionnaire were developed for and already applied to children in that age span. They got approved for



appropriateness by experienced social scientist working with adolescents in Mwanza region since many years and of course also by ethical committees.

Confidentiality and data protection

The information will be collected anonymously. No personal information is collected. Confidentiality of all information regarding their contribution will be maintained. All information collected by the questionnaire is anonymous and will be kept confidential. All information collected will be stored safely in a lockable cupboard and as soon as the data is digitalized it is saved in safe servers, where only the research team can access it. No raw data will leave the country Tanzania and the data management plan has been approved by the ethical committee (NIMR).

For any questions remaining you are very welcome to contact the following people:

PI	Local CO- PI	NIMR
Selina Rombach Principal Investigator Master student of Global Development Theory and Practice University of Bergen, Norway P.O. Box 7807 N-5020 Bergen Email: guf014@uib.no Telephone: +4915223251467	Dr. Richard Sambaiga Department of Sociology and Anthropology University of Dar es Salaam P.O. BOX 35043 Dar es Salaam, Tanzania Simue: +255-22-2410450-8	Regarding rights of participant in this study: The Chairperson, National Health Research Ethics Committee, National Institute for Medical Research, P.O.Box 9653 Dar es Salaam Telephone: +255-22-2121400



Mitazamo na uelewa kuhusu hedhi na usaidizi wa madaraja ya kijamii- ushawishi wa imani za mfumo dume juu ya mtazamo wa hedhi miongoni mwa wanafunzi wa shule zilizopo Kaskazini mwa Tanzania

Fomu ya taarifa

UONGOZI WA SHULE – Mwalimu mkuu/Msaidizi wa mwalimu mkuu

Utangulizi

Jina langu ni Selina Rombach, ni mtafiti kutoka chuo kikuu cha Bergen. Ningependa kukueleza kuhusu majukumu yetu na haki za washiriki kuhusu ombi letu la shule yako kushiriki katika utafiti huu. Ninaomba usome kwa makini au usikilize ninapokusomea maelezo haya, ili uweze kuamua kama shule hii ambayo iko chini ya utawala wako kushiriki katika utafiti huu na nitakuomba uweke sahihi yako kwenye fomu hii.

Umeombwa kutoa ruhusa kwa shule yako kushiriki katika utafiti huu kwa sababu shule ya _____ (jina la shule) ambayo iko chini ya uongozi wako imechaguliwa kuwa sehemu ya utafiti huu unaohusu mitazamo na uelewa kuhusu hedhi na usaidizi wa madaraja ya kijamii- ushawishi wa imani za mfumo dume juu ya mtazamo wa hedhi miongoni mwa wanafunzi wa shule zilizopo Kaskazini mwa Tanzania. Mradi unalenga kutoa maarifa kuhusu mtazamo kuhusu hedhi na jinsi inavyoathiriwa na ujuzi kuhusu hedhi na usaidizi wa miundo fulani ya kijamii. Kusudi ni kujua ni nini kinasisitiza ustawi wa kisaikolojia wa wasichana wa shule wanaopata hedhi. Matokeo yatasaidia kuboresha afua na hali ya wasichana walioko shuleni katika mazingira yao ya elimu ili kukuza ushiriki bora wa shule na ufaulu wa wasichana wa shule za sekondari.

Ni kwa nini utafiti huu unafanyika? Na kwa namna gani?

Changamoto za afya ya hedhi na balehe zinahusishwa na matatizo ya kisaikolojia (kama: hisia za kuaibika kupita kiasi, kusononeka na wasiwasi), matatizo ya afya (kama: maumivu, kuongeza uwezekano wa maambukizi ya via vya uzazi na njia ya mkojo), matatizo haya yanawapata zaidi wasichana lakini kwa njia tofauti yanawapata wavulana pia. Mradi huu wa utafiti unazingatia ustawi wa kisaikolojia. Utapima mtazamo kuhusu hedhi/uungaji mkono wa miiko kuhusu hedhi, uelewa kuhusu hedhi na maoni ya mwanafunzi kuhusu miundo ya kijamii kati ya wasichana na wavulana (pamoja na kupima mwelekeo wa utawala wa kijamii). Mradi huu wa utafiti utatumia dodoso la karatasi ambalo litafanywa kwa wakati mmoja. Ukamilishaji wa dodoso, utajumuisha utangulizi, utiaji saina wa fomu ya ridhaa n.k. haupaswi kuchukua zaidi masaa mawili. Kwa hili, muda ambao wanafunzi wanatenga kwa utafiti utakuwa mfupi iwezekanavyo. Ukusanyaji wa taarifa utaongozwa na mtafiti mkuu na atasaidiwa na na msaidizi anayezungumza kiswahili ambaye ataeleza taarifa zote zinazohitajika kwa wanafunzi na anaweza kusaidia kufafanua maswali wakati wa kukamilisha dodoso pamoja na maswali yoyote ya shirika kabla na baada.

Sampuli tutakayo ihitaji ni ya wanafunzi wa Kidato cha 1 mpaka kidato cha 3 (wanafunzi walio chini ya umri wa miaka 18). Sampuli itafuata miongozo ya kitaaluma. Tutakuomba utupe idadi ya mikondo ya madarasa iliyoko kidato cha pili na cha tatu. Tutachagua baadhi ya mikondo ya madarasa kushiriki (tutafanya uchaguzi wa sampuli kwa kufanya bahati nasibu) Tutawaalika wanafunzi wote kutoka katika mikondo ya madarasa iliyoachaguliwa. Wanafunzi watapatiwa namba ya ushiriki isiyomtambulisha. Watapokea taarifa kuhusu mradi na haki zao na watatia saina kwenye fomu ya ridhaa pamoja na majina yao. Wanafunzi wote



waliotoa ridhaa watakaa darasani. Fomu za ridhaa zitakusanywa na kuhifadhiwa kwa usalama lakini zikitenganishwa na dodoso halisi. Baadaye watapokea dodoso ambalo wataandika nambari yao ya mshiriki (isiyojulikana) na kujibu maswali. Baada ya kukamilika kwa dodoso, utafiti utakuwa umekamilika shuleni kwako. Hakuna muda zaidi wa wewe au wanafunzi wako utakaombwa na timu ya utafiti. Iwapo kuna maswali zaidi yanayokuja baada ya sisi kuondoka tutaweza kupatikana kwa urahisi. Ni matumaini yetu kuwa mradi wetu utaboresha ustawi na mitazamo ya hedhi na kisaikolojia-kijamii pamoja na hali ya shule kwa ujumla ili kuwepo na ushiriki bora wa shule na ufaulu wa wanafunzi wa shule za sekondari.

Ninaweza kukataa shule hii kushiriki katika utafiti huu?

Ndiyo, ushiriki katika utafiti huu ni wa hiyari, na wewe kama mwenye mamlaka kwa shule hii unaweza kuamua endapo shule hii ishiriki au la.

Ninaweza kuamua shule hii kujitoa kushiriki katika utafiti huu? .

Ndiyo, unaweza kuamua kusimamisha ushiriki wa shule yako muda wowote na kwa sababu yeyote utakayokuwa nayo. Namba ya ushiriki itajumuisha jina la shule yako na linaweza kufutwa baada ya ukusanyaji wa taarifa

Ni nini nitahitajika kufanya endapo nitakubali shule hii kushiriki?

Kama ukiridhia shule hii kushiriki, nitakuomba utoe ridhaa kwa kuweka sahihi kwenye fomu ya ridhaa kwa niaba ya wanafunzi watakaoshiriki kwenye utafiti huu. Ridhaa yako itaturuhusu kufanya dodoso la utafiti kwenye shule yako. Pia tutamuomba kila mshiriki kujaza fomu ya ridhaa (kulingana na miongozo ya kisheria ya kufanya utafiti unaohusisha watoto). Wanafunzi hawatalazimika kushiriki katika utafiti huu ikiwa hawataki na watakuwa huru kuamua kutoshiriki sehemu yeyote ya utafiti huu.

Ni zipi faida za kushiriki katika utafiti huu?

Ushiriki wa shule yako utachangia katika utengenezaji wa maarifa muhimu kuhusu uzoefu na maoni ya kuhusu hedhi kwa wanafunzi wa shule za Sekondari. Mawazo tunayotarajia kupata yatasaidia kuchunguza mahitaji ya wasichana walio katika hedhi na nafasi ya uboreshaji wa afua za shule kuhusu afya ya uzazi na usawa wa kijinsia; mkoani Mwanza na kwingineko. Hatimaye, kushiriki katika tafiti kama hizi kunakuza mazingira mazuri ya shule, ushiriki sawa wa shule wa wanafunzi wote waliojiandikisha na kuboreshwa kwa ustawi wa kisaikolojia na kijamii katika kila siku ya mwezi. Kujazwa kwa dodoso la kitaaluma pia kunaweza kuwa tukio la manufaa kwa wanafunzi kwani ni ushiriki wa mapema wa tafiti za kitaaluma na mazoea yake. Zaidi ya hayo, maswali huruhusu tafakari ya kuvutia wa wanafunzi kuhusu hedhi na miundo ya kijamii na kwa hiyo inaweza kuwa na thamani ya uzoefu wa kielimu.

Kuna madhara gani ya kushiriki katika utafiti huu?



Wanafunzi waliochaguliwa ambao watashiriki katika utafiti watahitaji kutenga takriban dakika 45 kwa ajili ya dodoso. Dodoso halina maswali yanayohitaji taarifa binafsi wala maudhui yoyote yanayoweza kudhuru. Maswali yote yaliyoulizwa kwenye dodoso yalitengenezwa kwa ajili ya, na tayari yanatumika kwa watoto katika kipindi hicho cha umri. Yaliidhinishwa kufaa na mwanasayansi wa masuala ya kijamii mwenye uzoefu anayefanya kazi na vijana katika mkoa wa Mwanza tangu miaka mingi na pia na kamati za maadili.

Usiri na ulinzi wa takwimu

Taarifa zitakusanywa bila kujulikana. Hakuna taarifa za kibinafsi zinazokusanywa. Usiri wa taarifa zote kuhusu mchango wao zitatunzwa. Taarifa zote zilizokusanywa na dodoso hazitakuwa na utambulisho na zitawekwa siri. Taarifa zote zitakazokusanywa zitahifadhiwa kwa usalama kwenye kabati linaloweza kufungwa na mara tu data zinakapowekwa kidijitali zitahifadhiwa katika seva salama, ambapo ni timu ya utafiti pekee ndiyo inayoweza kuipata. Hakuna data ghafi itakayoondoka nchini Tanzania na mpango wa usimamizi wa data umeidhinishwa na kamati ya maadili (NIMR).

Kwa maswali yote yaliyosalia, tafadhali wasiliana na watu wafuatao:

PI	Local CO- PI	NIMR
Selina Rombach Idara ya ukuzaji na maendeleo ya Afya Chuo kikuu cha Bergen P.O. Box 7807 N-5020 Bergen, Norway Barua pepe: guf014@uib.no Simu: +4915223251467	Dr. Richard Sambaiga Idara ya sayansi ya jamii na mambo ya kale Chuo kikuu cha Dar es Salaam P.O. BOX 35043 Dar es Salaam, Tanzania Simu: +255-22-2410450-8	Kwa maswali yoyote kuhusu haki kama mshiriki Mwenyekiti kamati ya maadili ya tafiti Tanzania, Taasisi ya Taifa ya Tafiti za magonjwa ya binadamu (NIMR), P.O.Box 9653 Dar es Salaam Simu: +255222121400



Social Dominance Orientation and attitude towards menstruation – the influence of patriarchal beliefs on the attitude towards menstruation among school students in Northern Tanzania

**Consent form
SCHOOL GUARDIANS – Head teachers/Head mistresses**

Do you agree for this school to participate in this study? (Circle response) No/Yes

Participant Participant signature Date

Study team member's statement

I, the undersigned, have explained to the school administrator in a language that s/he understands the study procedures, the risks and benefits involved, and the obligations of the study team.

Study Team Member Name Signature of Study Team Member Date

Who can answer my questions about the study?

You can contact any of the following people about any questions or concerns you have about this study:

PI	Local CO- PI	NIMR
Selina Rombach Principal Investigator Master student of Global Development Theory and Practice University of Bergen, Norway P.O. Box 7807 N-5020 Bergen Email: guf014@uib.no Telephone: +4915223251487	Dr. Richard Sambaiga Department of Sociology and Anthropology University of Dar es Salaam P.O. BOX 35043 Dar es Salaam, Tanzania Simue: +255-22- 2410450-8	regarding your rights as participant in this study: The Chairperson, National Health Research Ethics Committee, National Institute for Medical Research, P.O.Box 9653 Dar es Salaam Telephone: +255-22-2121400

NOTE: You will get one copy for yourself, that you can keep and one will be kept by us.



Mitazamo na uelewa kuhusu hedhi na usaidizi wa madaraja ya kijamii- ushawishi wa imani za mfumo dume juu ya mtazamo wa hedhi miongoni mwa wanafunzi wa shule zilizopo Kaskazini mwa Tanzania

Fomu ya ridhaa ya ushiriki

UONGOZI WA SHULE – Mwalimu mkuu/Msaidizi wa mwalimu mkuu

Je, unakubali shule yako kushiriki katika utafiti huu? (zungusha jibu) Hapana/Ndiyo

Jina la mshiriki

Sahihi ya mshirishiki

Tarehe

Uthibitisho wa mtafiti

Mimi, ninayetajwa hapo chini, nathibitisha nimetoa maelezo kwa uongozi wa shule katika lugha anayoielewa. Maelezo niliyotoa yanahusu taratibu, faida na madhara ya ushiriki pamoja na wajibu wa watafiti.

Jina la mshiriki

Sahihi ya mshirishiki

Tarehe

Ni nini atakaye jibu maswali yangu kuhusu utafiti huu?

Kama una swali lolote linalohusu haki yako unaposhiriki kwenye utafiti huu, unaweza kumuuliza:

PI	Local CO- PI	NIMR
Selina Rombach Idara ya ukuzaji na maendeleo ya Afya Chuo kikuu cha Bergen P.O. Box 7807 N-5020 Bergen, Norway Barua pepe: guf014@uib.no Simu: +4915223251467	Dr. Richard Sambaiga Idara ya sayansi ya jamii na mambo ya kale Chuo kikuu cha Dar es Salaam P.O. BOX 35043 Dar es Salaam, Tanzania Simu: +255-22-2410450-8	Kwa maswali yoyote kuhusu haki kama mshiriki Mwenyekiti kamati ya maadili ya tafiti Tanzania, Taasisi ya Taifa ya Tafiti za magonjwa ya binadamu (NIMR), P.O.Box 9853 Dar es Salaam Simu: +255222121400

Ikikamilika: nakala moja kwa mshiriki; nakala moja ibaki kwa utafiti

Appendix C

Information and assent students



Attitudes and knowledge about menstruation and support for social hierarchies

Information sheet STUDENTS [under 18]

Introduction

My name is Selina Rombach, a researcher from the Department of Health promotion and Development of the University of Bergen in Norway. I am cooperating with the Department of Sociology and Anthropology of the University of Dar es Salaam. I would like to inform you about our duties and your rights concerning the requested participation in a study. We would kindly ask you to carefully read this document or listen as it is read out to you, to indicate if you agree to participate or not agree and if you agree, to sign it in the corresponding area.

You have been approached because you attend a school that has been selected to be part of project. The project aims to find out about children's opinion and thoughts about menstruation also about social groups and how they stand to each other. Therefore, we will ask questions in form of a questionnaire, which is a sheet of paper with some questions. We are asking these questions to many children going to a secondary school in the Mwanza region in the age of 12 until 16. We are inviting children in that age to the study because this is the age when menstruation starts for girls and can be difficult to handle in school for example

Why and how is this study being done?

For us it is interesting to hear children's opinion and thoughts about different topics. It helps us to understand your experiences and needs better. This can help to make the education you get in school better fit to it and create a better school environment, which means everyone could feel more comfortable in school. In this study we want to know what you think and know about menstruation and also what you think about groups of people and how they stand to each other. Because we can write about what you children think about the topics menstruation and other groups and this can help other adults creating good projects or interesting school lessons for children at your age.

We are going to hand out some sheets of papers and make sure everyone has a pencil to write. Then you will get enough time to read the questions and you can answer them. Sometimes you just need to tick a box/make a cross and sometime I want you to write down an answer. Make sure to write in away that we can read it well because we are very interested in your answers. If you have any questions or you do not understand some words or what to do. Please raise your hand and we will be happy to explain it to you.

There is one thing I want you to know: there is no right or wrong answer to the questions. I am interested in your opinion and would like to hear about it. You can not say anything wrong. It is not a test. It is not graded. Your teacher will not see what you answered. After you have completed all the questions you can put all papers you got from us together and we will collect them. The study is then completed for you and we will be thankful for your contribution. We will then take them to our office and read all the answers from all the children that took part in our study. This helps us writing a text about the topics and your children's opinion. But first we will anonymise the answer that means that your name disappears and nobody will know who answered what.

Can I refuse or stop being in the study?

You don't have to be in this research if you don't want to be. It's up to you. If you decide not to be in the research, it's okay and nothing changes. There is no punishment from us or your teachers if you do not want to take part. This is still your school, everything stays the same as before and you can just participate



in the normal classes after we are finished with the research. Even if you say "yes" now, you can change your mind later and its still okay.

You can contact me (PI: Selina Rombach) on this number: +4915223251467 or via the address at the end of the document, where you will sign. You can also ask your parents, friends or teachers to contact me and they can tell me that you would like to not take part in the research anymore. You can also talk to your teachers about it and they can contact me and let me know that you would like to not be part of the study anymore.

What is required of me if I take part in this study?

If you want to take part in the study, you will be asked to answer the questions on the sheets. Make sure to answer all the questions (as long as you feel comfortable with it) and write nicely, so we can read your answers. All students can participate, there are no certain requirements. You can ask questions at any time, just raise your hand and we will happily help you.

What are the possible benefits of participating in this research?

Nothing really good might happen to you immediately but answering the questions will in the future help to make schools a better place for everybody. Because we can write about what you children think about the topics menstruation and other social groups and this can help other adults creating good projects or interesting school lessons for children at your age.

You can keep the pencil as a compensation for your time. Again: this study has nothing to do with your school performance. So participating in the study will not give you any benefits to that nor will refusing giving you any disadvantages.

What are the possible disadvantages of participating in this research?

The activity will take up some of your time. We will try to keep that time as short as possible so that you can continue with your normal school lessons as soon as possible. I want you to remember that this is not a test and this is not graded. Therefore, it will have no effect for you, no matter what you answer. Your teachers will not see your answers nor your classmates. Me and my assistant will keep them safe and exchange your name with a number when we write about all the answers of all the children. So no one, except me and my assistants, will ever be able to know what you particularly answered to the questions. So, there is no risk of being teased about it and it will have no effect on your performance in school.



The questions have already been asked to children in other countries from other researchers and are appropriate for children. This means that children understand them and that it does not cause confusion or sorrow to read and answer the questions. If you still feel uncomfortable you can stop being part of the research at any time.

Confidentiality and data protection

The information will be collected anonymously and your name will be exchanged with a number. So no one excepts for me and my assistants will be able to see your name.

For any remaining questions you can contact the following people:

PI	Local CO- PI	NIMR
Selina Rombach Principal Investigator Master student of Global Development Theory and Practice University of Bergen, Norway P.O. Box 7807 N-5020 Bergen Email: guf014@uib.no Telephone: +4915223251467	Dr. Richard Sambaiga Department of Sociology and Anthropology University of Dar es Salaam P.O. BOX 35043 Dar es Salaam, Tanzania Simue: +255-22-2410450-8	For any question regarding your rights as a participant The Chairperson, National Health Research Ethics Committee, National Institute for Medical Research, P.O.Box 9653 Dar es Salaam Telephone: +255-22-2121400



Mitazamo na uelewa kuhusu hedhi na usaidizi wa madaraja ya kijamii
Fomu ya Taarifa
WANAFUNZI CHINI YA UMRI WA MIAKA 18

Utangulizi

Jina langu ni Selina Rombach, mimi ni mtafiti kutoka idara ya ukuzaji wa Afya na maendeleo kutoka chuo kikuu cha Bergen nchini Norway na ninashirikian na chuo kikuu cha Dar es salaam. Ningependa kukueleza kuhusu utafiti wetu na haki zako kuhusu ushiriki wako kwenye utafiti huu. Ninaomba usome kwa makini au usikilize ninapokusomea, ili uweze kuamua kama utapenda kushiriki ama la, endapo utapenda kushiriki nitakuomba uweke sahihi yako kwenye eneo nitakalokuonyesha.

Umeombwa kushiriki kwa sababu unasoma katika mojawapo ya shule ambazo zimechaguliwa kuwa sehemu ya mradi huu. Mradi unalenga kujua kuhusu maoni na mawazo ya watoto kuhusu hedhi pia kuhusu makundi ya kijamii na jinsi wanavyosimama kwa kila mmoja. Kwa hiyo, tutauliza maswali kwa namna ya dodoso, ambayo ni karatasi yenye maswali. Maswali haya tunawauliza watoto wengi wanaosoma shule ya sekondari mkoani Mwanza wenye umri wa miaka 12 hadi 16. Tunawaalika watoto wa umri huo kwenye mradi huu kwa sababu huu ndioumri ambao hedhi huanza kwa wasichana na inaweza kuwa ngumu kushughulikia hedhi wawapo shuleni.

Ni kwa nini utafiti huu unafanyika? Na kwa namna gani?

Kwetu sisi tungependa kusikia maoni na mawazo ya watoto kuhusu mada tofauti. Itatusaidia kuelewa uzoefu wako na mahitaji yako kwa namna bora zaidi. Hii inaweza kusaidia kufanya elimu unayopata shuleni ifanane nayo vyema na kuandaa mazingira bora ya shule, ambayo ina maana kwamba kila mmoja anaweza kujisikia vizuri zaidi anapokuwa shuleni. Katika utafiti huu tunataka kujua nini unafikiri na kujua kuhusu hedhi na pia nini unafikiri kuhusu makundi ya watu na jinsi wanavyojisimamiawao kwa wao. Kwa sababu tunaweza kuandika juu ya kile nyinyi watoto mnafikiria juu ya mada za hedhi na vikundi vingine na hii inaweza kusaidia watu wengine wazima kuunda miradi mizuri au mada za shuele zenye kuvutia kwa watoto wa umri kama wako.

Tutatoa baadhi ya karatasi na kuhakikisha kila mtu ana penseli ya kuandika. Kisha utapata muda wa kutosha wa kusoma maswali na unaweza kuyajibu. Wakati mwingine unahitaji tu kuweka alama kwenye kisanduku/kutengeneza msalaba na wakati fulani nataka uandike jibu. Hakikisha unaandika kwa namna ambayo tunaweza kusoma vizuri kwa sababu tunavutiwa sana na majibu yako. Ikiwa una maswali lolote au huelewi baadhi ya maneno au nini cha kufanya, tafadhali inua mkono wako na tutafurahi kukuelezea. Kuna jambo moja nataka ujue: hakuna jibu sahihi au lisilo sahihi kwenye maswali. Ninavutiwa na maoni yako na ningependa kuyasikia. Huwezi kusema chochote kibaya. Huu sio mtihani. Haitawekwa alama/maksi. Mwalimu wako hataona ulichojibu. Baada ya kumaliza maswali yote unaweza kuweka karatasi zote ulizopata kutoka kwetu pamoja na tutazikusanya. Utafiti utakuwa umekamilika kwa upande wako na tutashukuru kwa mchango wako. Kisha tutachukua karatasi kwenda nazo ofisini kwetu na kusoma majibu yote kutoka kwa watoto wote walioshiriki katika utafiti wetu. Hii itatusaidia kuandika taarifa fupi kuhusu mada hii na maoni yenu.



Lakini kwanza tutaficha majibu, hiyo ina maana kwamba jina lako halitaonekana na hakuna atakayejua nani alijibu nini.

Ninaweza kujitoa kushiriki katika utafiti huu?

Sio lazima uwe sehemu ya utafiti huu ikiwa hutaki kuwa. Ni juu yako. Ukiamua kutoshiriki kwenye utafiti, ni sawa na hakuna kinachobadilika. Hakuna adhabu kutoka kwetu au kwa walimu wako ikiwa hutaki kushiriki. Hii bado ni shule yako, kila kitu kitabaki kama hapo awali na unaweza kuendelewa kushiriki katika masomo yako mara baada ya utafiti huu. Hata ukisema "ndiyo" sasa, unaweza kubadilisha mawazo yako baadaye na bado ni sawa.

Unaweza kuwasiliana nami (Mtafiti Mkuu: Selina Rombach) kwa nambari hii: +4915223251467 au kupitia anwani iliyo mwisho wa karatasi hii, ambapo utaweka shihi yako. Unaweza pia kuwauliza wazazi wako, marafiki au walimu kuwasiliana nami na wanaweza kuniambia kuwa ungependa kutoshiriki tena katika utafiti. Unaweza pia kuzungumza na walimu wako kuhusu hilo na wanaweza kuwasiliana nami na kunijulisha kuwa ungependa kutokuwa sehemu ya utafiti tena.

Nikiamua kushiriki nitahitajika kufanya nini?

Ikiwa ungependa kushiriki katika utafiti, utaombwa kujibu maswali kwenye karatasi. Hakikisha umejibu maswali yote (ilimradi unajisikia huru kuyajibu) na uandike vizuri, ili tuweze kusoma majibu yako. Wanafunzi wote wanaweza kushiriki, hakuna vigezo vya kushiriki. Unaweza kuuliza maswali wakati wowote, inua tu mkono wako na tutakusaidia kwa furaha

Ni zipi faida za kushiriki katika utafiti huu?

Hakuna kitu kizuri sana kinaweza kutokea kwako mara moja lakini kujibu maswali kutasaidia katika siku zijazo kufanya shule kuwa mahali pazuri kwa kila mtu. Kwa sababu tunaweza kuandika juu ya kilenyingi watoto mnafikiria kuhusu mada za hedhi na vikundi vingine vya kijamii na hii inaweza kusaidia watu wazima wengine kuunda miradi mizuri au masomo ya shule ya kuvutia kwa watoto wa umri wako.

Kama fidia kwa wakati wako, unaweza kuweka penseli.

Tena: utafiti huu hauna uhusiano wowote na ufaulu wako wa shule. Kwa hivyo kushiriki katika utafiti hakutakupa manufaa yoyote kwa hilo wala kukataa kukupa hasara zozote.

Kuna madhara gani ya kushiriki katika utafiti huu?

Shughuli hii itachukua sehemu ya muda wako. Tutajaribu kutumia muda mfupi iwezekanavyo ili uweze kuendelea na masomo yako ya kawaida ya shule haraka iwezekanavyo. Nataka ukumbuke kuwa huu sio mthani na hautawekwa alama. Kwa hiyo, haitakuwa na athari kwako, bila kujali unajibu nini. Walimu wako hawataona majibu yako wala wanafunzi wenzako. Mimi na msaidizi wangu tutawaweka taarifa zako kwa usiri na kubadilishana jina lako na nambari wakati tunaandika majibu yote ya watoto wote. Kwa hivyo hakuna mtu, isipokuwa mimi na wasaidizi wangu, ataweza kujua ulijibu nini haswa kwenye maswali. Kwa hivyo, hakuna hatari ya kudhihakiwa na haitakuwa na athari kwenye utendaji wako shuleni.

Maswali haya tayari yameulizwa kwa watoto katika nchi nyingine kutoka kwa watafiti wengine na yanafaa kwa watoto. Hii ina maana kwamba watoto wanayaelewa na kwamba haileti mkanganyiko au huzuni kusoma na kujibu maswali. Ikiwa bado hujisikii huru unaweza kuacha kuwa sehemu ya utafiti wakati wowote.

Usiri na ulinzi wa takwimu



Taarifa zitakusanywa bila kuweka jina lako na jina litabadilishwa na kutambulika kwa namba. Kwa hivyo hakuna mtu isipokuwa mimi na wasaidizi wangu wataweza kuona jina lako.

Kwa maswali yote yaliyosalia, tafadhali wasiliana na watu wafuatao:

PI	Local CO- PI	NIMR
Selina Rombach Idara ya ukuzaji na maendeleo ya Afya Chuo kikuu cha Bergen P.O. Box 7807 N-5020 Bergen, Norway Barua pepe: guf014@uib.no Simu: +4915223251467	Dr. Richard Sambaiga Idara ya sayansi ya jamii na mambo ya kale Chuo kikuu cha Dar es Salaam P.O. BOX 35043 Dar es Salaam, Tanzania Simu: +255-22-2410450-8	Kwa maswali yoyote kuhusu haki kama mshiriki Mwenyekiti kamati ya maadili ya tafiti Tanzania, Taasisi ya Taifa ya Tafiti za magonjwa ya binadamu (NIMR), P.O.Box 0653 Dar es Salaam Simu: +255222121400

Appendix D

Ethical clearance from National Institute for Medical Research



THE UNITED REPUBLIC
OF TANZANIA



National Institute for Medical Research
3 Barack Obama Drive
P.O. Box 9653
11101 Dar es Salaam
Tel: 255 22 2121400
Fax: 255 22 2121360
E-mail: ethics@nimr.or.tz

Permanent Secretary
Ministry of Health
Government City Mtumba,
Health Road
P.O. Box 743
40478 Dodoma

NIMR/HQ/R.8a/Vol.IX/4143

01 November 2022

Selina Rombach
University of Bergen, Norway
C/o Dr. Richard Sambaiga
University of Dar es Salaam
P O Box 35043
Dar es Salaam

RE: ETHICAL CLEARANCE CERTIFICATE FOR CONDUCTING MEDICAL RESEARCH IN TANZANIA

This is to certify that the research entitled: **Social Dominance Orientation and attitude towards menstruation -the influence of patriarchal beliefs on the attitude towards menstruation among school students in Northern Tanzania (Rombach S. et al.)** whose local supervisor is Dr. Richard Sambaiga of University of Dar es Salaam, has been granted ethical clearance to be conducted in Tanzania.

The Principal Investigator of the study must ensure that the following conditions are fulfilled:

1. Progress report is submitted to the Ministry of Health and the National Institute for Medical Research, Regional and District Medical Officers after every six months.
2. Permission to publish the results is obtained from National Institute for Medical Research.
3. Copies of final publications are made available to the Ministry of Health and the National Institute for Medical Research.
4. Any researcher, who contravenes or fails to comply with these conditions, shall be guilty of an offence and shall be liable on conviction to a fine as per NIMR Act No. 23 of 1979, PART III Section 10(2).
5. Sites: Mwanza region.

Approval is valid for one year: 01 November 2022 to 31 October 2023

Name: Prof. Said S. Aboud

Name: Prof. Tumaini J. Nagu


Signature
CHAIRPERSON
MEDICAL RESEARCH
COORDINATING COMMITTEE




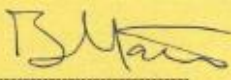


Signature
CHIEF MEDICAL OFFICER
MINISTRY OF HEALTH

CC: Director, Health Services-TAMISEMI, Dodoma.
RMO of Mwanza region.
DMO/DED of respective districts.



Appendix E

Research Permit from the Tanzanian Commission for Science and Technology

UNITED REPUBLIC OF TANZANIA	
	MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
	TANZANIA COMMISSION FOR SCIENCE AND TECHNOLOGY
	
RESEARCH PERMIT	
Permit No.	2023-39-NA-2022-024
Date issued	17 th January, 2023
Researcher's Name	Selina Rombach
Nationality	German
Research Title	Social Dominance Orientation and attitude towards menstruation -the influence of patriarchal beliefs on the attitude towards menstruation among school students in Northern Tanzania
Research Area(s)	Mwanza
Validity	From: 17 th January, 2023 to 16 th January, 2024
Contacts of local collaborator (with affiliated institution)	Dr. Richard Faustine Sambaiga, UDSM, P. O. Box 35091, Dar es Salaam, Tanzania richsambaiga@gmail.com +255 767 643 600
	
PROGRAM OFFICER	FOR: DIRECTOR GENERAL
IMPORTANT REQUIREMENTS	
<ul style="list-style-type: none">• A PI who wishes to continue with a research beyond the expiry date of the research permit should write to COSTECH two months before the operational permit's expiry date, to request for an extension or renewal of the permit.• Research permit that involves collecting human, plant or animal materials / data that will be exported outside Tanzania must submit a signed Material Transfer Agreement (MTA), Data Transfer Agreement (DTA) between Tanzania host institution and the foreign counterpart. The MTA/DTA will indicate terms for collecting, storing/managing, transporting, disposal or returning of the materials/DATA to Tanzania after the closure of the research project.• Any patent or intellectual property and royalty emanating from any research approved by the National Research Clearance Committee (NRCC) shall be owned as stipulated in the research proposals and in accordance with the IP policy of the respective research institutions.• All researchers are required to report to a Regional Administrative Secretary (RAS) of the study area and present the introduction letter and activity schedule (plan) prior starting any research activity.• All researchers are required to submit semi-annual, annual and final reports and all relevant publications made after completion of the research.• All communications should be addressed to COSTECH Director General through clearance@costech.or.tz; dg@costech.or.tz or +255 (022) 2700749; +255 (022) 2771358. Terms and conditions of the permit are found at www.costech.or.tz	
Tanzania Commission for Science and Technology, Ali Hassan Mwinyi Road, P.O. Box 4302, Dar Es Salaam. General line: +255(022) 277 1358, Fax: COSTECH, E-mail: dg@costech.or.tz , Website: http://www.costech.or.tz/	

Appendix D
Regional Permits

UNITED REPUBLIC OF TANZANIA
PRESIDENT'S OFFICE
REGIONAL ADMINISTRATIVE AND LOCAL GOVERNMENT AUTHORITIES

MWANZA REGION:

"REGCOM"
Phone: 028-2501037/2500686
Fax: 028-2541242/2501057
Email: ras.mwanza@tamisemi.go.tz



REGIONAL COMMISSIONER'S OFFICE,
Regional Drive road,
P. O. Box 119
33180 NYAMAGANA, MWANZA

Please reply to:

Ref. No. GB.47/333/03

13th February, 2023

The Municipal Director,
ILEMELA

The District Executive Director,
MISUNGWI

Re: **PERMISSION TO CONDUCT RESEARCH IN MISUNGWI DISTRICT COUNCIL
AND ILEMELA MUNICIPAL COUNCIL**

Please refer to the above mentioned subject.

2. Ms. Selina Rombach is a Master student of the programme named Global Development –Theory and Practice from the University of Bergen, Norway who has established cooperation with the Department of Anthropology and Sociology at University of Dar es Salaam.

3. The student is expected to carry out a research titled "*Social Dominance Orientation and attitude towards menstruation –the influence of patriarchal beliefs on the attitude towards menstruation among school students in Northern Tanzania.*" Particularly in Misasi and Sanjo schools in Misungwi DC as well as Kitangiri and Kiloleli schools in Ilemela Municipal Council.

4. You are requested to give her necessary support to ensure that the study is successfully conducted. The ethical clearance for this research is valid until 31 October, 2023.

5. Thank you for your cooperation.

Claudia Kaluli

**For: REGIONAL ADMINISTRATIVE SECRETARY
MWANZA**

Copy to: Ms. Selina Rombach,
University of Dar es salaam,
P. O.Box 35043,
DAR ES SALAAM



JAMHURI YA MUUNGANO WA TANZANIA
OFISI YA RAIS
TAWALA ZA MIKOA NA SERIKALI ZA MITAA
HALMASHAURI YA MANISPAA YA ILEMELA



Kumb. Na. AB.364/437//01A/11

Mkuu wa Divisheni ya Elimu Sekondari,
S.L.P 735,
ILEMELA.

22 Februari, 2023

HM
Kiloleli na Kitangiri
Tafadhali mfunzi
Wabwazi
MSKD
22.2.2023

Yah: KIBALI CHA KUFANYA "RESEARCH" KWA BI. SELINA ROMBACH

Tafadhali husika na somo tajwa hapo juu.

2. Mtajwa katika barua hii amepewa kibali cha kufanya utafiti na Katibu Tawala wa Mkoa kwa barua yenye **Kumb.Na. GB.47/333/03** ya tarehe **13 Februari 2023**. Utafiti wake utafanyika katika Shule za Sekondari ambazo ni Kiloleli na Kitangiri kuanzia tarehe 23.02.2023 hadi tarehe 31 Oktoba 2023.
3. Hivyo namtambulisha kwako ili aweze kupewa ushirikiano katika Shule husika. Nakala ya Kibali kilichotolewa na Katibu Tawala (M) imeambatanishwa.

Nawasilisha.

J.N. Balthazari

Kny: **MKURUGENZI WA HALMASHAURI YA MANISPAA**

ILEMELA

Nakala: Bi Selina Rombach,
Chuo Kikuu cha Dar-es-Salaam
S.L.P 35043
DAR-ES-SALAAM.



Municipal Director's Office, Ilemela Municipal Council, 200 Buswelu Road, 33282 Buswelu,
P.O. Box 735 Ilemela, Mwanza. Tel: + 255 (28) 2981196, Fax: + 255 (28) 2981196,
Email: md@ilemelamc.go.tz Website: www.ilemelamc.go.tz
(All Correspondance Should be Addressed to the Municipal Director)

Note: No copy was commissioned from the respective permit obtained from the regional office in Misungwi. (Only the headteachers received them).

Appendix F

Codebook

Variable	Variable name SPSS	
Identification number	ID	Number assigned to each survey
Code	Code	1 = 1 = rural (Misasi) 2 = 2 = urban (Kigasi) 3 = 2 = urban (Kiloleli) 4 = 1 = rural (Sanjo)
Gender	Gender	1 = female 2 = male
Year of birth	Age_year	Age in years
Month of birth	Age_month	1 = January 2 = February 3 = March 4 = April 5 = May 6 = June 7 = July 8 = August 9 = September 10 = October 11 = November 12 = December 13 = I do not know
Grade	Grade	1 = Form 2 2 = Form 3
Menarche	Menarche	1 = experienced menarche 2 = not experienced menarche 3 = not experienced menarche (male)
Living situation	Living	1 = parents 2 = grandparents 3 = alone 4 = siblings 5 = other family members 6 = boarding school 7 = boarding house/hostel 8 = other
Knowledge menstruation	K1 to K7	Single choice questions (K1-K2) yes/no/I do not know questions (K3-K7)
	K1	1 = false = 0 2 = false = 0 3 = false = 0 4 = right = 1
	K2	1 = false = 0 2 = false = 0 3 = right = 1 4 = false = 0 5 = false = 0
	K3	1 = right = 1 2 = false = 0 3 = false = 0
	K4	1 = right = 1 2 = false = 0 3 = false = 0
	K5	1 = right = 1 2 = false = 0 3 = false = 0
	K6	1 = false = 0

		2 = right = 1 3 = false = 0
	K7	1 = right = 1 2 = false = 0 3 = false = 0
Menstruation attitude	M1 to M12	High score = high secrecy (reversed: M1, M2, M1, post-collection) 1 = strongly disagree 2 = disagree 3 = somewhat disagree 4 = somewhat agree 5 = agree 6 = strongly agree
Social Dominance Orientation	D1 to D16	High score = high support dominance (reversed: D1, D3, D5, D7, D9, D10, D11, D14, pre collection) 1 = strongly disagree 2 = disagree 3 = somewhat disagree 4 = somewhat agree 5 = agree 6 = strongly agree