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Respectful maternity care and the role of male partners in Mozambique: practices, obstacles and conceptualisation

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"I think it's important men are involved and go with the wife to pregnancy care because ...

it's an act of showing love."

Male religious leader, 56 years old.
(Respondent Study 3)

Preface

My PhD Journey started in 2015, after working as an ICRH-intern in Mozambique. From a midwife working for doctors without borders to a fulltime PhD scholarship was not the most typical path. It is only because of the motivating and open spirit of ICRH I have taken that path and until now did not regret it a single day. Back then, I was convinced there were simple and quick solutions for complex problems. As a midwife you are trained to recognise a problem and react quickly. I believed that getting more men involved in pregnancy and childbirth was such a simple quick solution for improving maternal health. I believed in invitation letters and randomised controlled trials, while today 5 years later, I look completely different at it. I learned how certain solutions might create new problems and that a "one fits all approach" almost never works.

Besides becoming a better researcher throughout the past five years, this PhD has given me several opportunities and new challenges, and I am grateful my promotors always encouraged me to grab these opportunities with two hands. I want to thank my supervisor Prof Olivier Degomme, who always gave me more questions than answers, but also pushed me to get the most out of this PhD in all aspects. In the first months I could do a very rewarding internship in Uppsala (thank you Elin!), later on I could make a film about fathers (thank you Marleen Temmerman Fund!), I could teach for the London Tropical School of Medicine and Hygiëne in Uganda and Tanzania (thank you Phill!) and make a photo exposition (thank you Nafissa & Cindy & Tina!). I am grateful I could stay close to myself and combine the pure scientific work with all these valuable more hands-on activities. I would like to thank my supervisor Prof Nafissa Osman, who always opened doors for setting up new projects. I will miss our encouraging talks in the small hospital office in Maputo. Also a special thank you to my supervisor Prof Kristien Roelens, who guided me by sharing her expertise as researcher and gynaecologist in both Mozambique and Belgium. I also would like to thank Miss Sally Griffin for her endless time and support, without her investment and guidance this doctoral dissertation would not have been possible. In the past five years I have been surrounded by great people in and outside work, which made this PhD journey an exciting and happy period of my life.

An important life-event in 2018 made me even more motivated to complete my PhD trajectory. I became a mother myself, which let me experience how important partner support is in all his facets. My first pregnancy I experienced support from a long distance, and in the second pregnancy my partner could not have been closer, being in my corona bubble for 24h a day. Becoming a mother has been one of the most beautiful and rewarding events in my life, but from my own experience

I can say all support, being it from a partner, family, or friends, makes it even more joyful.

My brother has been probably the one in the family most familiar with the hassles of writing a PhD and has been the one reassuring me all would be fine in the end. Just as my sisters, Sara & Roosje, he has been one of the reasons why I always was happy to come home to Belgium after a (sometimes very long!) fieldtrip. I am grateful to my both parents, who always supported me, even if I was working at the other side of the world. Then, my amazing friends, who distracted me during lunchbreaks in Ghent and even travelled 24h if that was the only way to meet. Thank you Olena, Helena, Leonie, Xantippe, Audrey and Inez. Lastly, my husband Ayuk, who was by my side almost every hour of the last year and was always helpful and understanding, also when I suddenly needed to work in the evening or weekend. Besides all those amazing people there have been many more who were helpful, the list is endless less, therefore to all the people underneath, thank you and you all know why.

Anna 25/03/2021

Contents

0.1 List of Abbreviations

ANC: Antenatal Care

BPCR: Birth Preparedness and Complication Readiness

CHW: Community Health Worker

CICI: Context and Implementation of Complex Interventions

D&A: Disrespect and Abuse

SDSMAS: Serviço Distrital de Saúde, Mulher e Acção Social

FGDs: Focus Group Discussions

HPs: Health Professionals

HIV: Human Immunodeficiency Virus

ICCM: Integrated Community Case Management

ICPD: International Conference on Population and Development

IOM: Institute Of Medicine

LMICs: Low and Middle Income Countries

LICs: Low Income Countries

MI: Male Involvement

MNH: Maternal and Newborn Health

MH: Maternal Health

MMR: Maternal Mortality Ratio

MDGs: Millennium Development Goals

MoH: Ministry of Health

MISAU: Ministério Da Saúde

PMTCT: Prevention of Mother-To-Child Transmission Strategies

DPS: Direcção Provincial de Saúde

RCT: Randomised Controlled Trial

RMC: Respectful Maternity Care

SARI: Severe Acute Respiratory Illness

StIs: Sexually Transmitted Infections

SDGs: Sustainable Development Goals

TLTL: Too Little, Too Late

TMTS: Too Much, Too Soon

TB: Tuberculose

UN: United Nations

WHO: World Health Organisation

NGO: Non-Governmental Organisation

UNICEF: United Nations International Children's Emergency Fund

AMOG: Associação Moçambicana de Obstetras e Ginecologistas

MCH: Mother and Child Health

0.2 Outline of the Thesis

This doctoral dissertation is divided into 7 chapters. Chapter 1 starts with a general introduction regarding maternal health care, the concept of male involvement in maternal health and the context of the conducted studies (which is Mozambique). Chapter two outlines the objectives and research questions of this dissertation, followed by an overview of the different methodologies that have been used to assess them. Subsequently the three main research aims of this dissertation are addressed in chapter 3, 4 and 5 respectively. Chapters 3-5 are based on six articles, of which five have been published and one submitted for publication.

Chapter 6 of this dissertation consists of an overall discussion of the findings, a thorough reflection on the strengths and limitations, and a discussion on the implications of these findings for maternal health practice, policy, and future research. Lastly, an English and Dutch summary of the main findings, curriculum vitae and other appendices conclude the dissertation in Chapter 7.

Chapter 1

General introduction

In this chapter I will first discuss the concept of maternal health from a public health perspective and current evidence regarding the role of men in maternal health. This will be followed by describing the specific context in which majority of the studies have been conducted, namely southern Mozambique.

1.1 Maternal health

1.1.1 Concept

Maternal health refers to the health of women during pregnancy, childbirth and the postnatal period (until 6 weeks after childbirth) according to the definition of the World Health Organisation (WHO)[1]. While pregnancy should be a positive experience, ensuring all women and their babies reach their full potential for health and well-being, many women risk to lose their life while giving birth[1].Although important progress has been made in the last two decades, about 295 000 women died during and following pregnancy and childbirth in 2017[1]. The most common direct causes of maternal injury and death are excessive blood loss, infection, high blood pressure, unsafe abortion, and obstructed labour, as well as indirect causes such as Human Immunodeficiency Virus (HIV), anaemia, malaria, and heart disease[1].Taking into account that majority of maternal deaths are preventable with timely management by a skilled health professional working in a supportive environment, the burden of maternal mortality worldwide remains unacceptably high.
Ending preventable maternal death remains at the top of the global public health

agenda[2]. Nevertheless maternal deaths are only a small portion of the global maternal burden of ill health. It is estimated that for each death, nearly 20 additional women suffer from life-long disabilities as a result of severe pregnancy-related morbidity[3, 4]. As a consequence, simply focusing on surviving pregnancy and childbirth can never be the marker of successful maternal health care. Recently efforts to improve maternal health have been expanded, by also reducing maternal injury, disability, and mental suffering. Maternal health and well-being has been promoted by taking into account different markers of maternal health such as experience of care and evidence based standards. The number of indicators used to monitor the state of maternal and newborn health globally have increased tremendously the last decade, in an attempt to cover different dimensions of health system and input, care access and availability, care quality and safety, coverage and outcomes, and impact. Especially regarding quality of care recent debate has grown to increase validity and feasibility of indicators[5].

1.1.2 Recent gains in maternal health

Much progress has been made during the Millennium Development Goals (MDGs) era in improving maternal, newborn and child health. According to United Nations (UN) inter-agency estimates, the global maternal mortality ratio declined by 44 per cent - from 385 deaths to 216 deaths per 100,000 live births - between 2000 to 2015[6]. After the 2015 MDG agenda , the Sustainable Development Goals (SDGs) were designed, which posed a redefined list of priorities based on the successes and shortcomings of the MDGs.The SDGs include 17 goals to be achieved by 2030. Goals related to maternal health are SDGs 3, 5, and 10: the achievement of good health and well-being, of gender equality, and of reduced inequality respectively. However, unlike MDG 5, the SDGs do not reserve a goal specifically dedicated to maternal health. The closest they come is in setting a target under SDG 3 to reduce maternal mortality to 70 deaths per 100000 live births globally[2].

First reports regarding maternal health since the SDGs report substantial progress is continuing (with in majority of countries worldwide more than three-quarters of women receiving ANC and SBA services), but the extent of intraregional inequality remains overwhelming, especially for Asia and Africa[2, 7, 8].Furthermore levels of maternal mortality remain unacceptably high in certain regions, especially in sub-Saharan Africa, and in particular in rural areas[7]. Preventable maternal morbidity and mortality in Low and Middle Income Countries (LMICs) is often associated with the absence of timely access to quality care, defined by Miller et. al in 2016 as " too little, too late" , which means inadequate and delayed access to services, resources, or evidence-based care[9].

Globally, efforts have largely focused on increasing antenatal care (ANC) coverage

and facility-based childbirth as key mechanisms to reduce perinatal and maternal mortality[10, 11] during the MDGs era, together with improving access to family planning services and safe abortion services (where permitted). While these efforts met with some success, availability of emergency obstetric care in LMICs continues to be hampered by many factors, including human resource shortages and health system weaknesses[12]. Moreover, increased coverage of interventions must be matched with improvements in quality of care, which seems much harder to achieve[13]. More recently, maternal health efforts are shifting from an emphasis on boosting service utilisation to improving quality of care, because poor quality of care in health care settings seem to compromise the expected health gains of the increased antenatal care coverage and institutional delivery rates in LMICs[13].Quality issues are often aggravated by inequities and evidence suggests that especially poor and marginalized women (e.g. adolescents and single women) may encounter disrespectful or abusive care, affecting the overall quality of care[14, 15].

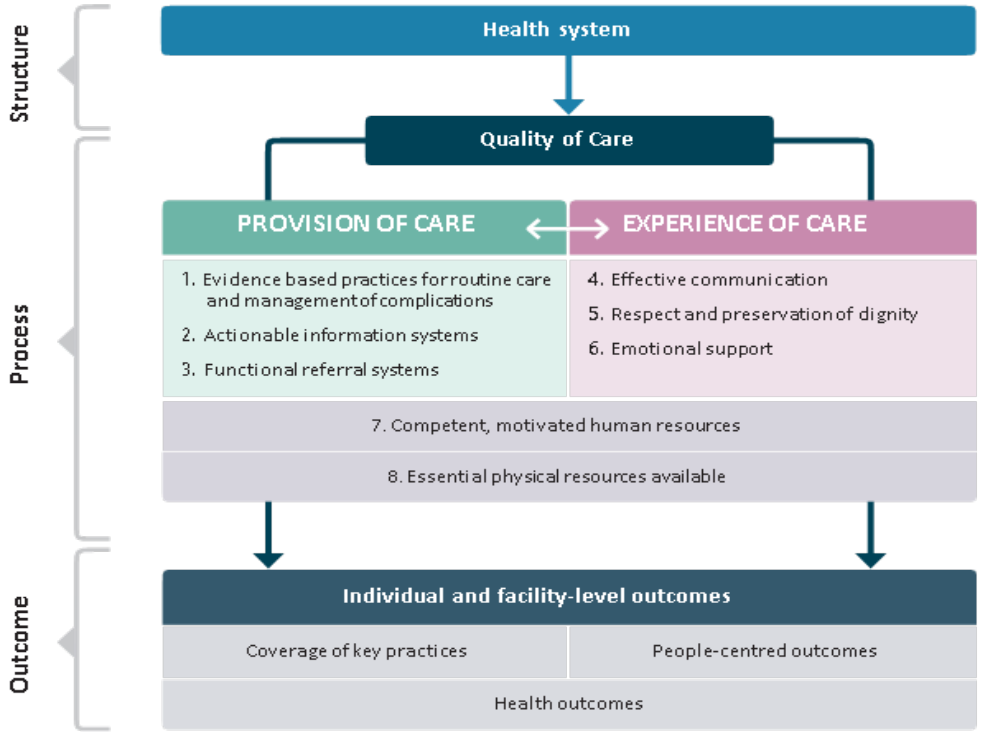
1.1.3 Quality of care

In the past decades, quality of care has received several definitions by different organisations and researchers[16]. The Institute Of Medicine (IOM) and the WHO for example have each their unique definition of healthcare quality, shaped by their interests and priorities[17, 18]. The IOM (2013) defines healthcare quality as "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge", while WHO emphasizes healthcare quality should be defined as the process of making strategic choices in health systems[17, 18]. The IOM established six domains of health care quality in 2001 which have been re-utilised by many other important stakeholders, including WHO. The six dimensions dictate that health care should be safe, effective, patient-centered, timely, efficient, equitable[19]. Improving quality of maternal and newborn health care will be fundamental in further reducing global maternal and newborn mortality and morbidity in the future and achieving the SDGs. To support this goal, WHO developed a framework for the quality of maternal and newborn care in health facilities (see figure 3)[20]. The framework defines eight domains of quality of care, with quality standards for each domain, and is unique in that it encompasses both the provision *and* experience of care, as well the cross-cutting areas of sufficient resources and the availability of competent, motivated human resources.

The framework is in line with the definition of WHO regarding quality of care by emphasizing the important role of health systems in providing quality of care[18, 20]. According to the WHO framework, dimensions important for the

experience of care include effective communication with women and their families about the care provided, their expectations and their rights; care with respect and preservation of dignity; and access to the social and emotional support of their choice. This reflects the growing attention to interpersonal and respectful maternity care. The WHO quality of care standards informed the development of new WHO intrapartum care recommendations[21], emphasizing the importance of respectful maternity care.

Figure 1: WHO framework for the quality of maternal and newborn health care from the WHO recommendations on Intrapartum care for a positive childbirth experience 2018.



1.1.4 From quality of care to respectful maternity care

On the continuum of maternal health care, two extreme situations exist: too little, too late (TLTL) and too much, too soon (TMTS)[9]. TLTL describes care with

inadequate resources, below evidence-based standards, or care withheld or unavailable until too late to help. TMTS describes the routine over-medicalisation of normal pregnancy and birth. TMTS includes unnecessary use of non-evidence-based interventions, as well as use of interventions that can be lifesaving when used appropriately, but harmful when applied routinely or overused[18]. Although TLTL remains a global public health problem, the rapid increase in facility births has introduced new challenges. TMTS is rapidly increasing everywhere with increasing rates of potentially harmful practices (especially in the private sector), reflecting weak regulatory capacity as well as little adherence to evidence-based guidelines in many facilities. Historically TMTS is typically ascribed to high-income countries and TLTL to low-income and middle-income ones, but today these extremes coexist in many countries worldwide driven by social and health inequities[18]. The need for a global approach to quality and equitable maternal health, supporting the implementation of evidence-based care for all, has also spurred the attention for more "respectful maternity care" worldwide[22, 23].

Respectful care in childbirth is often regarded as a human right[24] and is referred to by the WHO as care organized for and provided to all women in a manner that maintains their dignity, privacy and confidentiality, ensures freedom from harm and mistreatment, and enables informed choice and continuous support during labour and childbirth[25]. Respectful maternity care was brought to global attention in 2010 by Bowser and Hill's landscape analysis, defining disrespect and abuse in childbirth by 7 categories: physical abuse, non-consented care, non-confidential care, non-dignified care, discrimination, abandonment and detention in facilities[26]. A categorisation that is still used today by several researchers. There exists a growing body of evidence regarding the high prevalence of disrespect worldwide, ranging from 15-98% , with adolescents, women of low socio-economic status, migrant women, women living with HIV and ethnic minority women being at the highest risk[27].

1.1.5 Respectful maternity care along the continuum of maternal and newborn health care

Disrespect and abuse (often referred to as the absence of respectful maternity care) and respectful maternity care have both been used as headings in the maternal health care literature to describe similar problems and concerns. Until today there is no consensus on what constitutes respectful care, but an emerging Respectful Maternity Care (RMC) movement (supported by the White Ribbon Alliance, Amnesty international and WHO) advocates for a patient-centred care approach, based on respect for women's basic human rights and clinical evidence[28]. The seven rights of childbearing women are the rights to: freedom from harm and

ill treatment; information; informed consent and refusal; respect for choices and preferences, including the right to a companion of choice wherever possible; confidentiality and privacy; dignity and respect, equality, freedom from discrimination and equitable care; timely healthcare and the highest attainable level of health; and liberty, autonomy, self-determination, and freedom from coercion[24]. This vision was also endorsed by WHO, referring to those rights in several statements about respectful maternity care[29, 25, 27]. The inclusion of the right to "timely healthcare and the highest attainable level of health" shows RMC goes beyond the definition of Bowser & Hill, where timely healthcare and broader quality of care standards are not included.

Allowing a birth companion of choice during labour and childbirth is one of the crucial aspects of RMC that has been receiving more attention recently, with an evidence-to-action brief published by WHO in 2020[30]. Birth companions have shown to improve outcomes for women and new-borns, nevertheless only half of the African countries seem to have a policy regarding free choice of birth companionship. Furthermore not all policies are successfully translated into good practices. Evidence has shown women preferences regarding companionship are hardly known and respected[30].

Noteworthy, mainly labour and childbirth have been extensively studied with regard to respectful care while "maternity care" encompasses health services delivered to women in the prenatal, intrapartum and postnatal period[31]. The focus on intrapartum care for providing respectful maternity care is often justified by highlighting the well-known critical hours around childbirth for preventing maternal and neonatal deaths [27] and the fact that women are particularly vulnerable during childbirth[25]. The period around childbirth is the most critical for saving the maximum number of lives and preventing stillbirths. About 45% of postpartum maternal deaths occur during the first 24 hours[32]. However we could argue that the primary goal of respectful maternity care is not directed towards reducing maternal mortality and morbidity ("the hard numbers"), but improving the experience of care and mitigating disrespect and abuse. In that aspect, also prenatal and postnatal care could benefit from an increased focus on respectful care. While several studies and guidelines also focus on experience of care during prenatal care, this is often from a quality of care perspective (for example the WHO recommendation on a positive pregnancy experience from 2016) rather than avoiding disrespectful treatment. The only reference made to respectful care during pregnancy by WHO is the advice to integrate a lay companion (eg the male partner/a friend or relative) already during ANC, referring to the important role they might play later on as a birth companion: "companions should already be involved into antenatal care visits (and childbirth education classes etc.) to

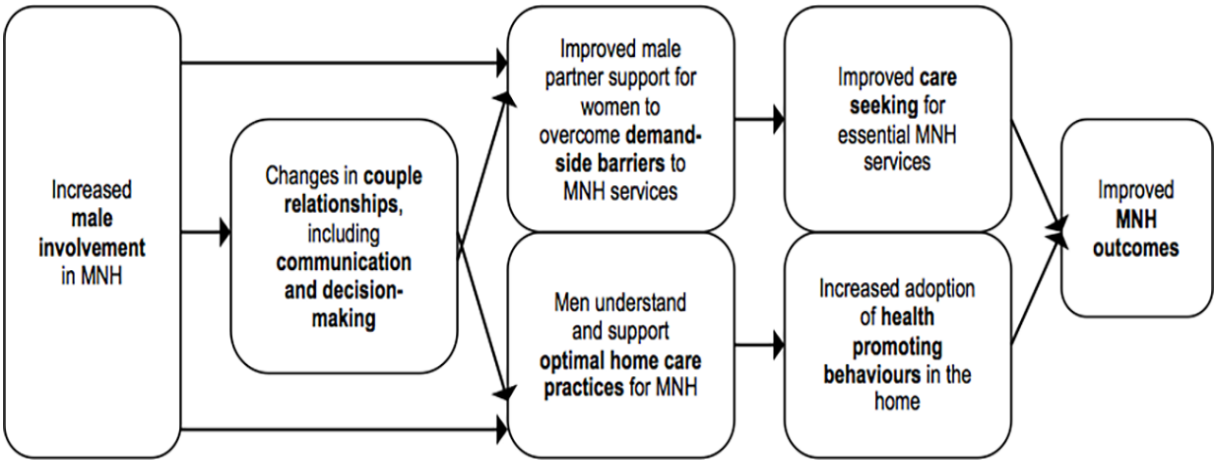
empower them with knowledge about the process of labour, familiarity with the health care facility structure, and the skills and confidence to better support the woman" .

Also regarding postnatal care for women and newborns much less guidance and research exists on what is considered as "respectful" care. Overall postnatal care is a neglected area along the continuum of maternal and newborn healthcare, with in many LMIC the lowest adherence compared to antenatal care and institutional delivery[33, 34].

1.1.6 The role of men in maternal health

Men often play a critical role in increasing access to and utilisation of maternal health services[35]. Especially in strong patriarchal communities the influence of men on maternal health care utilisation and access is profound. Men in these settings control household resources and often make critical decisions that affect maternal health, including the access and utilisation of health services[36]. Furthermore men often play a central role in birth preparedness and the actions needed in case of an emergency[37]. Men can also adopt, and encourage other household members to adopt health-promoting behaviours at home such as improved nutrition and malaria prevention[38, 39]. Interventions to increase male involvement in Maternal and Newborn Health (MNH) have also been linked with positive changes in couple dynamics, such as increased couple communication and equitable decision-making, which contribute to improved health and care-seeking outcomes[40]. All these different pathways regarding the importance of men's role in maternal health have been summarised by Tokhi et al in 2018 in Figure 5 [41]. Notably the relationship between male involvement and couple relationships is the most debatable one, with some studies also highlighting potential harmful consequences of male involvement on couple relationships [41](see further). Furthermore the causal pathway might also be constructed differently, with some studies reporting male involvement and improved maternal health as a *consequence* of improved couple (gender equitable) relationships rather than the cause[42].

Figure 2 Explanatory model for the effect of male involvement on MNH outcomes by Tokhi et al.[41]



1.2 Male involvement in maternal health

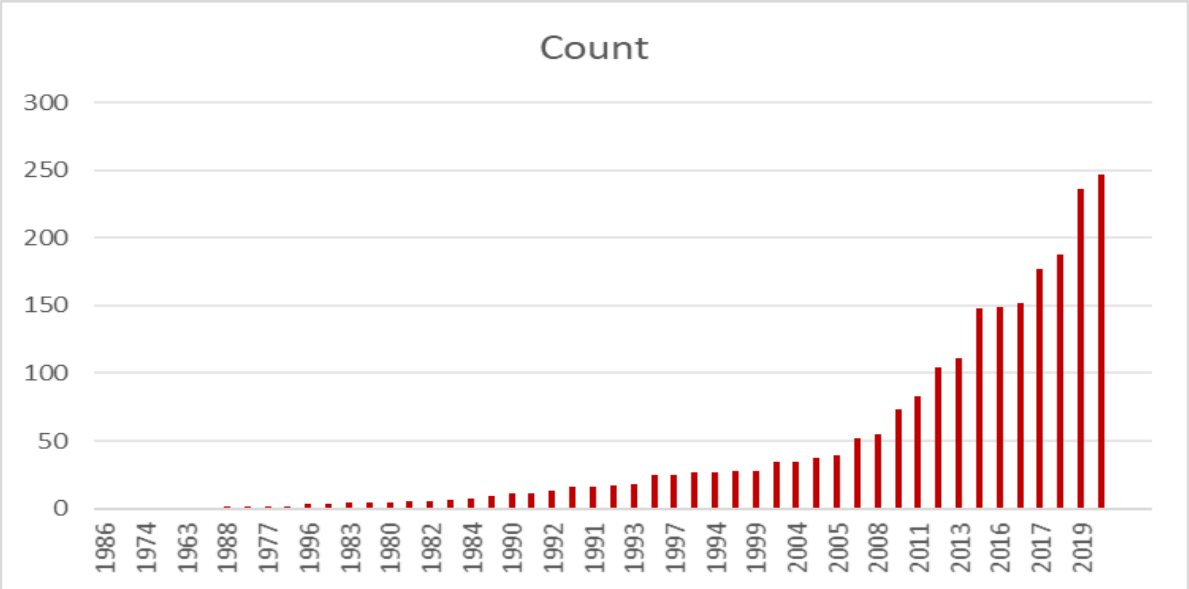
1.2.1 The conceptualisation of male involvement in maternal health

Both the understanding and operationalization of male involvement in maternal health have changed over time, often defined by the context. The first articles on the father's role during pregnancy and childbirth emerged in 1960, focusing on male support during pregnancy in the Western world and exploring the pros and contras of husbands' presence in the delivery room. Later on also reports regarding the effect of male partner's involvement (often based on the marital status of women or registration of a father on the birth files) on neonatal outcomes were studied, mainly in North America. Nevertheless scientific studies were scarce and only boomed after 1990 (see Figure 6), with a new field of male involvement literature, focusing on the role of the male partner in mother to child transmission of HIV and prevention of Sexually Transmitted Infections (STIs) in Sub Saharan Africa. As a consequence, the literature on male involvement programs has been dominated by studies from LMICs in the last decade.

The concept of male involvement in maternal health has always been multifaceted and topic of debate among social and medical scientists[43, 44, 45]. Over time the

motives for involving men have also changed: ranging from pure medical reasons (mainly combatting HIV and STIs) to increasing social and financial support for women, obtaining gender equality or improving later participation in child rearing. As a result of these changing concepts, the concept of male involvement in maternal health has been viewed and indexed in different ways at different times.

Figure 3 Number of articles found per year in the pubmed database (after entering a search strategy for retrieving articles about male involvement in maternal health, see additional file 1, article 1).



1.2.2 Male involvement on the public health agenda

In the field of public health, the concept of involving men in maternal health (and broader field of reproductive health) has received major attention for the first time at the Cairo conference in 1994[35]. The signatories of the International Conference on Population and development (ICPD) Programme of Action agreed that it is important for men to take more responsibility for their sexual and reproductive behaviour and family life[46], The language of the Programme of Action of ICPD was quite progressive, even today, indicating men should be involved in reproductive health for improving their families' health, but importantly, also their

own health. Furthermore the document also refers to obtaining gender equality when involving men by stating that "Men play a key role in bringing about gender equity since, in most societies, men exercise preponderant power in nearly every sphere of life, ranging from personal decisions regarding the size of families to the policy and programme decisions taken at all levels of Government. It is essential to improve communication between men and women on issues of sexuality and reproductive health, and the understanding of their joint responsibilities, so that men and women are equal partners in public and private life"[46]. Noteworthy, obtaining gender equality and improving men's own health are both elements that have often been neglected in male involvement interventions until today. Most programs' primary intention is to improve maternal and newborn health outcomes and use male involvement as an instrumental approach to reach these goals[47, 48].

1.2.3 The association of improved health outcomes and male involvement

Globally, the involvement of men in maternal health programs has been associated with positive maternal health outcomes and increased uptake of interventions to prevent HIV transmission[49, 50]. A systematic review of 2015 by Yargawa et al. showed that male involvement has a beneficial impact on maternal health through reduced odds of maternal depression and improved utilisation of maternal health services, more specifically by higher rates of skilled birth attendance and postnatal care[47]. Male involvement was also associated with decreased likelihood of childbirth complications, although the evidence was less strong. Contrary to reports from developed countries, there was little evidence of positive impacts of husbands' presence in the delivery rooms[42]. Studies exploring male presence at childbirth in Low Income Countries (LICs) are scarce and rather in a piloting phase, furthermore strong socio cultural norms often hamper the involvement of men as birth companions[51, 52, 53].

A later review in 2018 found that interventions to engage men were associated with improved antenatal care attendance, skilled birth attendance, facility birth, postpartum care, birth and complications preparedness and maternal nutrition[41]. This was confirmed by another review of Suandi et al. (2019), showing that involving a male partner in antenatal care was associated with institutional delivery and post-partum visit uptake[54]. The impact of interventions on mortality, morbidity and breastfeeding is less clear[41]. Other perceived benefits of male involvement interventions are increased couple communication and joint decision-making, but the effects on women's autonomy are ambiguous[48, 55, 41]. The latter is often not documented in male involvement studies, because they lack measures that capture power dynamics within couple relationships and as a consequence certain negative

side-effects on women's autonomy might stay under the radar[41]. Also personal experiences with male involvement interventions of men and women are often not captured, which are considered as limitations of the current study designs[48].

1.2.4 Barriers towards male involvement

Barriers to male attendance at antenatal care and broader involvement in maternal health operate at multiple levels and vary according to the context. Within the community, gender norms/roles in reproductive health care usage, HIV related stigma, and the perception of female oriented services are barriers for higher involvement of men[56, 57, 58, 59]. At health system level negative provider attitudes, overcrowded services and limited opening hours seem prominent barriers[60, 59]. At interpersonal level distrust or outlined gender roles in division of tasks are hampering male involvement, while at the individual level poor maternal health knowledge or interest, fear of HIV related stigma and limited time/access (for example men working abroad or with strict working hours) have been cited [57, 43, 61, 62]. Majority of studies report women and men are in favour of more male involvement[61, 63], although a study of Ghana reported the opposite; women had a negative attitude regarding more male involvement in maternal health[64]. Women reported they might lose their "safe space" , consider pregnancy and childbirth as their domain and fear negative reactions in the community[64]. Importantly, majority of the studies focus on barriers towards male antenatal care attendance [43], which might not correspond to barriers towards other aspects of involvement (emotional and practical support for example).

1.2.5 Sociocultural factors affecting male involvement

Different sociocultural contexts and norms within and between countries hamper generalisability of specific approaches to male involvement in maternal healthcare. While male involvement strategies mostly operate from a medical point of view (such as improving maternal health care attendance and adherence to prevention of mother-to-child transmission (PMTCT) strategies), they often have an impact on deeply rooted socio-cultural values and norms[48, 65, 66], varying globally. These sociocultural factors include gender roles, social expectations and traditions in reproduction and child-care, cultural systems such as family structures and inheritance systems (marital versus patriarchal), and the role of the extended family in reproductive decision making (such as the role of parents in law). Issues surrounding gender roles and power are especially relevant within the context of male involvement and serve as barriers to both male and female participation in maternal health care services. More recently more attention is given to these socio-cultural structures (not seldom from social scientists) and how to set up

effective male involvement interventions intervening at different levels. Several studies have shown that multicomponent interventions are often more successful and sustainable, by taking into account barriers at different levels[67, 48, 65].

1.2.6 Measurement challenges

Defining and measuring male involvement is important for evaluating the effect of male involvement interventions on maternal and newborn health outcomes, as well as to compare the findings of different strategies. However, the absence of a common definition and measurement has been highlighted as a major research gap and weakness of the current evidence in the literature [44, 68, 69].

Many different definitions of male involvement in maternal health have been used in literature. Common single used measures of involvement include antenatal HIV testing[49] and male attendance at antenatal care visits [70]. Other measurements often combine different items into an index or scale. Byagamishu's male involvement index (2011) combines participation in maternal health care services, knowing and discussing ANC appointments, financial support and condom use[71]. Another similar composite, described by Ampt et al. (2015) added shared decision making on maternal health care issues as an item[72]. Also knowledge of maternal health care issues and birth preparedness have been included as measurements of male involvement[49, 73, 74, 75]. Within the field of PMTCT a novel validated "male partner involvement scale" has been constructed by Hampanda et al. in 2020 [76], including male encouragement/reminders for adherence to treatment and active participation in PMTCT services as indicators. Despite some attempts to create these male involvement indexes, they often only serve for one study in one specific context, demonstrating a lack of consensus on which aspects should be taken into account when measuring "male involvement" in maternal health globally.

1.2.7 Unintended negative effects of male involvement

Male involvement strategies' primary aim has always been to improve maternal and newborn health outcomes. However, previous programs have documented some negative side-effects that are potentially harmful to women's and newborns' health and women's empowerment. Side-effects could include decreased exclusive breastfeeding or early breastfeeding cessation among HIV positive women (because of pressure of the husband) [41], pressure to alter a woman's health choices and service preferences [41] and intimate partner violence (IPV) [77, 78]. Also disclosure of IPV during antenatal care might be hampered by male involvement strategies due to a lack of privacy[79, 80]. These effects could have unintended

consequences on uptake of maternal services and maternal and newborn health outcomes. In extreme cases, some male involvement strategies (implemented by both the government and local leaders) have encouraged the denial of services to women who present themselves at ANC without male partners, compromising the uptake and access to early initiation of maternal care [81, 82, 39, 83]. Therefore male involvement strategies should always try to consider, assess and minimise the potential negative effects of increased male involvement.

1.2.8 WHO guidance on male involvement

The need to involve men has been increasingly recognized since 1990, but only in 2015 the World Health Organization set partner involvement as one of the priority interventions to improve PMTCT outcomes [27]. The 2015 WHO recommendation on maternal and newborn health promotion interventions included active involvement of men during pregnancy, child birth and post-partum period as an effective intervention to improve maternal as well as newborn health outcomes[27]. Focusing on pregnancy and childbirth more detailed recommendations are mentioned in the "WHO recommendations on antenatal care for a positive pregnancy experience" and "WHO recommendations on Intrapartum care for a positive childbirth experience" [21].

During pregnancy WHO states that men should be targeted during the implementation of community mobilization through facilitated participatory learning and action, community mobilisations and home visits. The primary aim of engaging male partners is to guarantee they support women to make healthy choices for themselves and their children. Furthermore they emphasize it is important to consider women's preferences, as including male partners could also have a negative effect for women who would prefer to discuss pregnancy-related and other matters without their partner's involvement.

During childbirth, WHO recommends a companion of choice, such as her spouse or partner, for all women throughout labour and childbirth. However, they also add that simple measures such as allowing only female relatives to accompany women during labour could be used as cost-effective and culturally sensitive way to address privacy issues and cultural preferences[30].

All these WHO recommendations are highlighting the importance of involving men, but also show the emphasis on guaranteeing women's autonomy under all circumstances. Furthermore the practical implementation of how men should actually be involved in a respectful way stays vague.

1.3 Mozambique

1.3.1 Geography

Mozambique is a sub-Saharan country located in the Southeast African region. It has a total surface of around 800 000 square km and 2.500 km of coastline along the Indian Ocean. The country has geographical boundaries with Tanzania, Malawi, Zambia, Zimbabwe, Swaziland, and South Africa. Mozambique has a tropical climate with two seasons, a wet season from October to March and a dry season from April to September[84].

The country is divided into 11 provinces. The capital city (Maputo City) also has a provincial status. The provinces are further divided into 154 districts and 407 administrative divisions, encompassing smaller localities and aggregated villages[85]. The total population of the country was estimated to be around 30 million in July 2020[85], a doubling of the population since 1995. The fertility rate has reduced since 1970 but is still high, with an average of almost 5 births per women in 2018[85]. Around 36% of the total population is estimated to be living in urban areas[85, 86].

1.3.2 Population

Mozambique's population of 30 million inhabitants is ethnically diverse. Over twenty different cultural sub-groups of both matrilineal and patrilineal systems of descent can be identified in the country[87, 88]. Northern and parts of central Mozambique have a matrilineal marital, kinship and inheritance system while southern Mozambique has a patrilineal system. In a patrilineal system the woman moves to live with the husband's family after marriage, that pays a bride price to the woman's family in exchange. In this system women often have less power than in a matrilineal system because the man has "paid" for the woman and thus has power over her and their children. In the northern provinces most of the commu-

nities are characterised by a matrilineal structure, which implies that descent is traced through the mother and the maternal ancestors, the inheritance of property and land titles belonging to mother's lineage and that the man moves to the house of the woman after marriage. The globally more common patrilineal type of societal structure is the opposite and is, for instance, the cause of the male's surname often being taken when a new family is started[89]. Closely related to the two different marital systems, southern and northern Mozambique are significantly different socio-economically and culturally, including in terms of gender dynamics and family structure[88].

1.3.3 Socio economic background

Mozambique has enjoyed remarkable economic gains in the last decade, with an average of 7% of economic growth between 2011 and 2015 [90]. Unfortunately this trend has turned recently, in 2017 the GDP decelerated to 3.7% with increasing external debts and an ongoing financial crisis [90]. Furthermore the economic gains per capita are rather small, due to the fast growing population and only a minority of the population benefiting from the higher living standards brought about by increased levels of income.

Currently, the country is witnessing a boom in the natural resources extraction industry. Coal and natural gas have been the two main products mobilizing some international investors into the country. All major gas projects are oriented in the Cabo Delgado province, a region with major threats of armed groups[91]. The insurgency is led by al-Shabab, a group that pledged allegiance to the Islamic state in 2019 and who is increasing attacks in this predominantly Muslim region [91].

Overall, large scale corruption at different levels and poor governance seem to hamper increased economic and social welfare, despite the economic gains from natural resources[92]. Mozambique is facing major challenges in the area of social development and protection and the level of wealth distribution among its citizens, with an increasing inequality level between the highest and lowest incomes. Mozambique is placed in the position of 180 out of 188 countries in the 2018 Human Development Index[93].

1.3.4 General living conditions

There are substantial variations in the distribution of wealth across the country. Six out of ten households (64%) have access to an improved source of drinking water, ranging from 53% in rural areas to 89% in urban areas[94]. More than 50% of the people has cell phones in most provinces, except in Zambézia (47%), Niassa (48%) and Cabo Delgado (49%). Most households in rural areas (90%)

do not have electricity. The country has a national standard for measuring wealth (divided in five quintiles) by calculating a score based on the number and types of consumer goods they own, from a television to a bicycle or car, and based on housing characteristics, such as a source of drinking water, sanitary facilities and building materials of the house. More than three quarters (81%) of the population in urban households are in the fourth and fifth richest quintile of wealth unlike the rural area where 80% of the population are in the lowest three quintiles[94]. However, poverty in cities might be masked by this assessment because of high inequality within the cities. Furthermore people living in slums might have more "goods" compared to certain rural areas, although they live in an unsafe and unhealthy environment.

At the provincial level, Zambézia has the highest percentage of population in the lowest quintile (35%)[94]. Inhambane (2%), Gaza (1%), Maputo Province (<1%) and Maputo City (<1%) have the lowest percentages of the population in the lowest wealth quintile[94].

1.3.5 Education and employment

Mozambique has one of the lowest average years of schooling in the world. Fourteen percent of women and 27.3% of men above 25 years old received some form of secondary education. Half of the female population (50%) above 15 years old can read and write, while this is 73% for the male population [84]. The overall literacy rate increased the last years from 48% in 2003 to 61% in 2017[95]. Illiteracy is more prevalent in rural areas, where 57% of people are non-literate, compared to 23% in urban settings[95]. The Government has tried to enhance school access for the growing young population but struggles to also improve quality. The rapid expansion of the population has placed intense pressure on school management, teaching personnel, and the overall quantity and quality of effective classroom instruction, resulting in a large number of overcrowded schools, growing student/teacher ratios, and low reading and math test scores[96]. Furthermore the system is dealing with high rates of teacher and director absenteeism, affecting the overall quality and organisation of education [97].

The labour market is dominated by the informal economy. Agriculture continues to employ the vast majority of the workforce with 71.7% , followed by services (all type of work where someone is hired to offer a certain service) with 20.4% . The vast majority (83.1%) of employment is considered as "vulnerable" employment. Vulnerable employment is defined as people engaged as unpaid family workers and own account workers[84].This type of work is considered vulnerable because of the risk of sudden loss of income and lack of social security.

Labour migration is common in Mozambique, mainly by men, with South Africa as main destination[98]. Mining and farming jobs are the norm for Mozambicans working in South Africa, with about 24,000 Mozambicans working in the mining sector[99]. As a consequence the South, poor in natural resources and more prone to drought and floods than the other regions, has labour migration as its most important economic feature, distinguishing it from the Centre and North[98]. Some argue that the difference in wealth between the regions is largely attributed to the labour migration and the transfer of significant volumes of remittances[98, 100]. In line with other studies about migration, a study conducted in southern Mozambique also showed an increase in women's autonomy and decision making power within the household associated with their husbands' migration[100].

1.3.6 Inequality

Looking at data from 1995-2015, there is no common trend in inequality in the African continent, not even clear regional trends[93]. Income distributions evolved in a wide variety of ways across countries, underlining the role of national institutions and policies in shaping inequality. While inequality in East Africa had declined substantially in Ethiopia and Kenya, the gap between rich and poor has increased tremendously in Mozambique and Zambia. In Mozambique the incomes of the bottom 40 percent grew 40 percentage points less than the average[93].

Also gender inequality in Mozambique remains a major challenge in the access to health services. The Gender Inequality Index synthesises gender-based inequalities in three dimensions—reproductive health, empowerment, and economic activity—on which Mozambique ranks 138 of 160 countries [93].

1.3.7 Health system organisation

The provision of healthcare services in Mozambique is mainly through the public sector. The national health system comprises of four levels of care: the primary healthcare level (Community based care and Health Centers), the secondary level of care (District Hospitals and Rural Hospitals serving more than one district), the tertiary level of care (Provincial Hospitals and General Hospitals in the main cities) and the fourth level of care (Central and Specialized Hospitals)[101, 102]. In theory, the flow of patients should follow this organization with minimal bypass but in reality continuity of care and functioning referral systems are a major challenge. Similar to several other health systems in LMICs, appropriate gatekeeping to limit the number of patients using tertiary care who could be better served in primary care is limited[103].

In 1991, the Government of Mozambique approved the practice of private medicine[101]. The country witnessed a fast increase in the number private clinics, specifically in the main towns and in particular in Maputo City. Despite this increase in the number of private health facilities, it is estimated that more than 90% of maternal and child healthcare services is provided by the public health facilities, although exact numbers are lacking[104]. Outside the official national health system, traditional medicine plays an important role in Mozambique. According to the Ministry of Health, around 70 per cent of the people in Mozambique uses traditional medicine to treat physical, as well as mental and social, illnesses[105]. The most known traditional practitioners are herbal practitioners and traditional midwives[105].

Healthcare services evolution

The population in Mozambique has suffered from colonial oppression, political instability, several episodes of civil war and starvation as a consequence of severe droughts and floods in the last century[106]. The severe social and political instability within the country has affected the installation of a strong and functioning health system in a negative way (for more information about the health system evolution and policies, see appendix 1). While Mozambique has been a donor darling for the West for years, donors are increasingly withdrawing their support because of corruption. At the same time, the government is taking a more autonomous line, angered by donor impositions[107]. Today the health sector is led by the Ministry of Health or "Ministério da Saúde" (MoH/MISAU) at the central level and supported by 11 Provincial Health Directorates or "Direcção Provincial de Saúde" (DPS) at the provincial level and 150 District Services for Health, Women, and Social Action or "Serviço Distrital de Saúde, Mulher e Acção Social" (SDSMAS) at the district level.In 2017, the health sector received 7.8 percent of the total value of the State Budget. Mozambique spends nearly the same as other low income countries on 'health as a percentage share of total government expenditure', but slightly less than other sub-Sahara African countries[108]. Furthermore donor-provided resources to the Health Sector have been both inconsistent and declining in real value, which is related to the hidden debt crisis around 2016 and associated national financial crisis, causing distrust among donors[109].

1.3.8 Health status indicators

Infectious and communicable diseases

The country's burden of disease is largely a consequence of the high levels of poverty and a result of the high prevalence of infectious and communicable diseases. Among the top contributors to the country's disease burden are malaria, diarrhoea, HIV/AIDS, respiratory infections and tuberculosis [110]. Malaria is considered the major contributor to the country's burden of disease with

being responsible for 40% of all outpatients' attendance at clinics and approximately 30% of all hospital deaths[111]. Around forty percent of children age 6-59 months tested positive for malaria by rapid diagnostic test according to the 2018 Mozambique Malaria Indicator Survey[112]. Preventive measures have improved over the last decade but can still be improved for avoiding malaria related morbidity and mortality. The same study from 2018 showed that 73% of children under 5 and 76% of pregnant women age 15-49 slept under an Insecticide-treated bed net the night before the survey and that two fifth of pregnant women age 15-49 received 3+ doses of Intermittent preventive treatment in pregnancy to prevent malaria. Malaria prevalence varies widely among the country: ranging from 1% in Maputo Cidade and Maputo Província to 57% in Cabo Delgado.

Mozambique is one of the sub-Saharan African countries most affected by the HIV/AIDS epidemic, with a national HIV prevalence of 15.1 percent in 2015 for adults ages 15–49[113]. The other two major killers in Mozambique are Severe Acute Respiratory Illness (SARI) and diarrhoea, major causes of deaths in children under-five years of age [114]. Mozambique is also one of the WHO 30 high tuberculosis (TB) burden countries and faces many challenges in its successful control of TB, especially among persons living with HIV[115]. In 2018, WHO estimated Mozambique's TB prevalence to be 551/100,000 people[115].

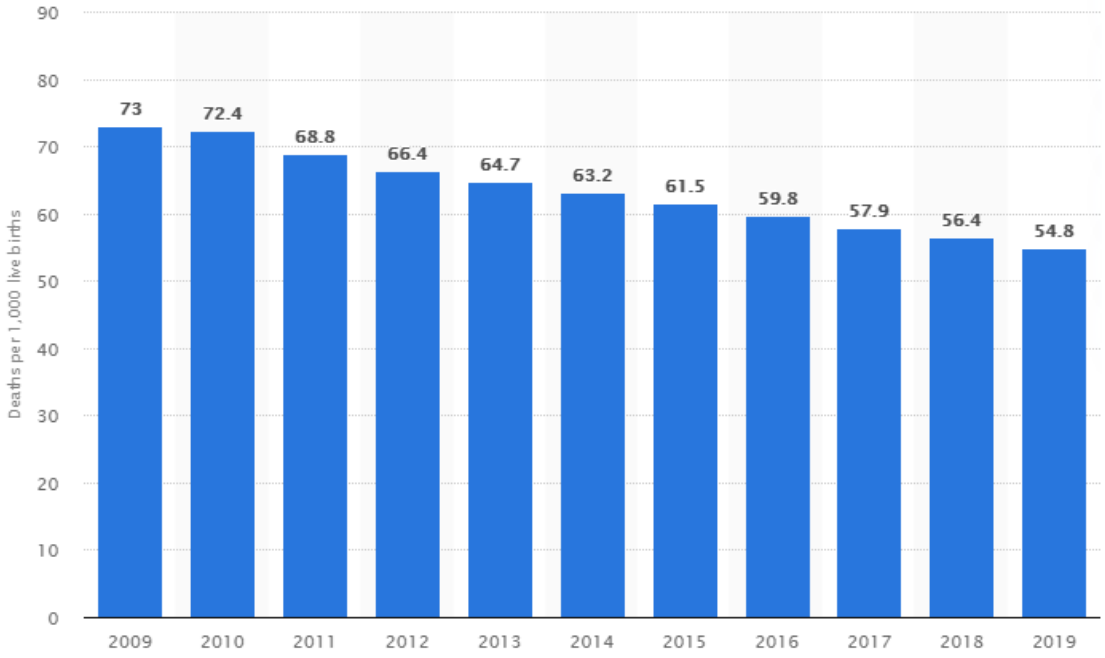
The co-existence of all these severe diseases such as TB, HIV, malaria, and severe viral infections with non-communicable diseases, results in a "double burden of disease" [116]. Within the health system, the current focus on vertical disease programming (often implemented by specific donors) has been criticised because vertical programming traditionally fails to recognize comorbidities or to encourage joint management approaches[116]. Nevertheless, Mozambique has been investing in integrated community case management (iCCM) of diarrhoea, malaria and pneumonia by installing a national community health worker (CHW) programme, mainstreamed into government policy and service delivery. The program was installed in 1978, suspended in 1989 because of several problems related to financing and weak supportive supervision, but relaunched in 2010 [117]. Evaluations show that the CHW's can play a vital role in timely accessing health care services in case of both mild diseases and health emergencies in the communities [118, 119].

Neonatal and Child health

Worldwide, about 44% of child deaths occur during the neonatal period (before age 1 month) and this proportion is increasing because neonatal mortality is decreasing slower than is under-5 mortality (=child mortality rate)[120]. In Mozambique neonatal mortality accounts for 39% of child deaths and was estimated at 29 per 1000 live births in 2019, with the child mortality rate being at

74 deaths per 1,000 live births[121]. Both demographic indicators show a steady decline over the last years. Also the infant (=children under 1 year of age) mortality rate decreased in Mozambique in the last three decades (see Figure 2), but it is still high with 55 deaths of children less than one year of age per 1000 live births in 2019 [122]. Infant, child and neonatal mortality rates are usually considered to be a reflection of the extent and impact of prevailing poverty levels and as a proxy indicator of socio-economic development[123]. Among the main causes are cited the poor quality of healthcare, caused by a low number of qualified health professionals (HPs) and lack of equipment and supplies. Additional contributors are a lack of decent referral system, long distances, lack of transport, a lack of accountability among health providers, poor communication between health care workers, and gender issues[124, 125, 126, 127]. Studies in Mozambique, Benin, India and Tanzania have all reported how gender norms dictate the role of women in the society, whereby women (with their children) might have a lack of economic options, lack of autonomy and limited decision making power. Factors that all hamper access to health services and might have a negative impact on women's and children's health [128, 57, 129].

Figure 4 Infant mortality trend between 2009-2019 for Mozambique (according to data.unicef.org)

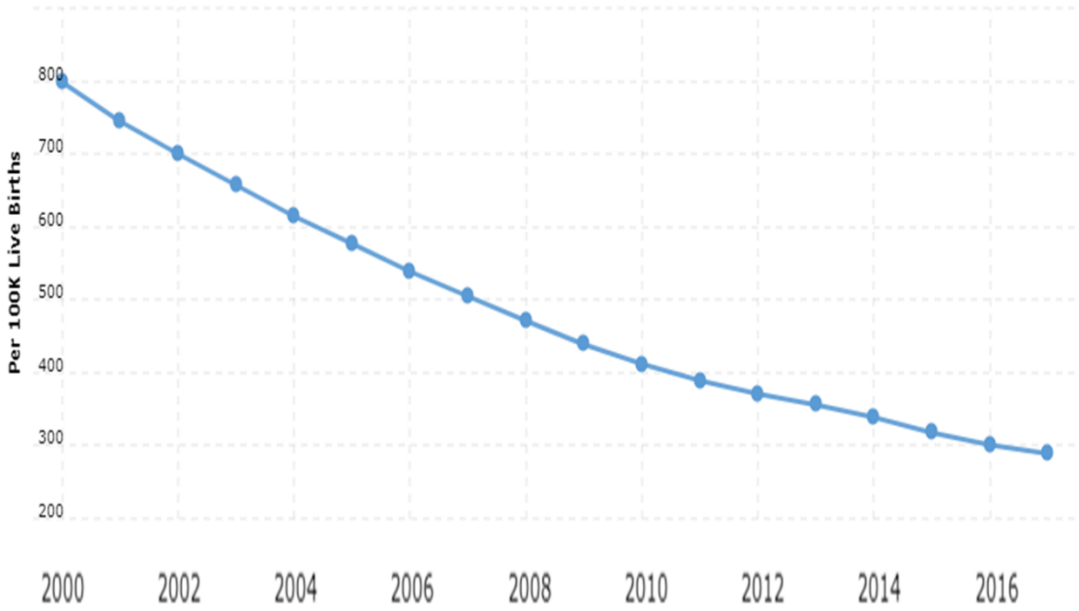


Maternal health

The maternal mortality ratio (MMR) has decreased significantly in Mozambique over the last years (see figure 5). Nevertheless, the latest numbers from 2017 indicate that the MMR is still among the highest in the world with 289 maternal deaths per 100 000 livebirths (according to the World Bank collection of development indicators, compiled from officially recognized sources)[130]. Noteworthy Mozambique has wide variations across the country for almost all health indicators, with worse health indicators in the northern provinces. On a positive note, the country has made significant progress in encouraging women to deliver in health facilities, with a nationwide institutional delivery rate of 70.3% [113]. However, also here progress has been uneven, with a rate of 87.5% in Maputo Province but only 41.5% in Zambezia[113].

Besides increasing the number of women delivering in the hospital also the aspect of quality of care has received more attention over the last years[113].Recognising the importance of quality of care, the MoH of Mozambique has made humanization and patient friendly care during ANC and delivery one of its priorities since 2007. The culture of promoting RMC has become more widespread in Mozambique and a selection of maternity wards have become centers of quality and humanized Maternal and Newborn Health care provision under the "Iniciativa Maternidade Modelo" (Model Maternity Initiative)[131]. Respectful maternity care is one of the essential packages of the model and includes respect for beliefs, traditions, and culture; the right to information and privacy; choice of a companion; freedom of movement and position; skin-to-skin contact and early breastfeeding; appropriate use of technology and effective lifesaving interventions; and prevention of violence and disrespectful care[26]. Besides training health providers the initiative also included several quality assessments at facility level. More information about all components of the initiative can be found online at https://www.mchip.net/sites/default/files/Promoting_RMC_in_Mozambique.pdf. By 2017 the initiative was implemented in all hospitals (central, provincial and district) within the country and almost half of the health centres [unpublished report JHPiego and MoH]. However, no evaluation has been conducted (or made public) after introducing this model regarding women's experiences with care during labour and delivery in Mozambique. Studies examining the prevalence of disrespect and abuse in maternity care in Mozambique are scarce, especially in comparison to other countries in the region such as Tanzania, South-Africa and Kenya[132, 133, 134, 135].

Figure 5 Maternal mortality trend between 2000-2017 for Mozambique (according to the World Bank Estimates.)



David et al. (2014) examined the prevalence of maternal deaths in Maputo Province and analysed the causes of these deaths more in depth [136]. In line with global causes of maternal mortality, life-threatening emergencies around the time of birth seems the major contributor to maternal mortality because of several delays in reaching the facility and a lack of adequate emergency responses inside health services. More than half of maternal deaths in Maputo Province were related to indirect causes such as HIV (20%), malaria (20%) and other infectious diseases (11%). The direct causes count for 49% of maternal deaths and include post-partum haemorrhage, pre-eclampsia/eclampsia and, and sepsis [137]. The high proportional rate of maternal deaths related to indirect causes can be explained partly by a high HIV prevalence (15.8%) among pregnant women [138, 82, 139]. HIV infection during pregnancy increases the risk of maternal death by about eight times. In countries with a high HIV and malaria prevalence antenatal care can reduce maternal mortality significantly by preventing and treating these infections in an early state, as well as allowing detection of other morbidities during pregnancy and providing the opportunity for adequate treatment [140]. Inadequate antenatal care (both attendance and quality) is cited as one of the causes of maternal morbidity and mortality in Mozambique [136]. The last available data showed that 93% of women have at least one antenatal care consultation

during pregnancy but that only 55% received the recommended four or more ANC visits[113].

Chavane et al. (2018) analysed maternal mortality in Mozambique by the three delay model and found that 40% of maternal mortality was related to a delay to reach the health facility that provides emergency obstetric care (delay type II) and 14 % of maternal deaths were related to a delay in receiving appropriate care once reaching the health facility providing emergency obstetric care (delay type III). The last delay demonstrates that the Mozambican health system is struggling to provide adequate emergency obstetrical care services, due to several factors such as is the lack of specific midwifery and specialist skills from health providers, shortage in supplies and a hampering referral system.The standardized national curriculum of midwifery education requires 4 years of studying, followed by continuous professional development through in-service training and refresher courses[141, 142]. However, midwifery care in health facilities is often provided by health professionals with less years of schooling ("nursing assistants" for example with 1 year of training) due to a lack of midwives. Delays in reaching the health facility (delay type II) seem influenced by long distances from health facilities, poor referral systems within the health system, and lack of money and decision making power [143, 101]. Also smaller studies, focusing on both urban and rural areas, report similar findings including spatial disparities in geographic access to reproductive health services and gender inequality in decision making power in pregnancy[144, 145, 146] as causes of poor maternal health outcomes.

An at risk group for poor maternal health outcomes in Mozambique are young girls. Adolescent pregnancy is known to be one of the contributors to Mozambique's high maternal mortality rate, with almost half of girls aged from 15 to 19 years having a child or having been pregnant[113]. Teenage mothers are more likely to suffer serious complications and death, as well as their newborns[147]. Approximately 20% of maternal deaths occur in girls who have not reached their twentieth year and 14% as a result of abortion[148].

Also unsafe abortions [149] are a major contributor of maternal mortality in Mozambique, although national data about the prevalence of safe and unsafe abortions are hard to find. A recent study in Maputo and Quelimane reported that 9.2% of women had undergone an induced abortion, of which 20% was unsafe[150]. In addition there is a high unmet need for family planning services (one in four women of reproductive age has an unmet need) [150], causing a high number of unplanned pregnancies and high fertility rate of 5 births per women.

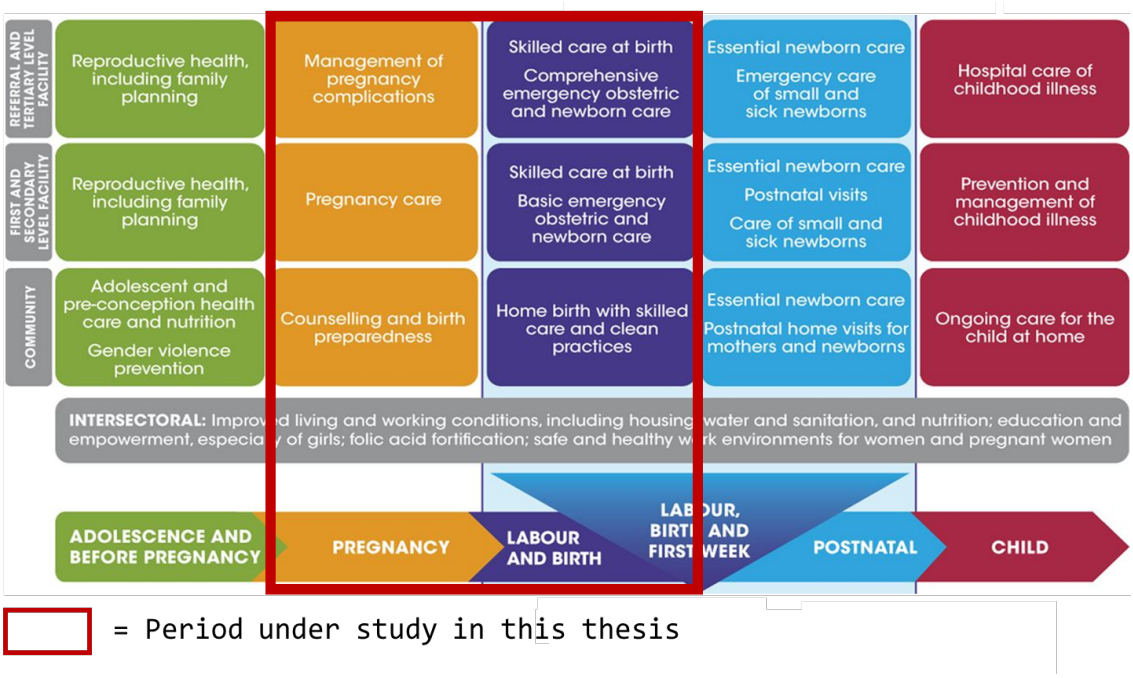
It is important to realise that men seem to be the main decision makers in accessing maternal health services in Mozambique, varying from accessing antenatal care to delivering in a health facility and accessing family planning services[151]. The important role of men in maternal health care access and utilisation was shown in a

recent study showing a direct link between male participation in birth preparedness and complication readiness (BPCR) and higher odds of institutional delivery[152].

1.3.9 Focus of the thesis

In this thesis we focus on pregnancy and childbirth along the continuum of maternal and newborn health care (see Figure 4) in southern Mozambique with a particular focus on "respectful maternity care" . In addition we focus on the role of the male partner within this period, as they are hardly included in maternal health care programs but play an essential role in accessing and receiving maternal health care services [35].

Figure 6 Packages in the continuum of care, adapted from the WHO Technical Consultation on Newborn Health Indicators[153]



Chapter 2

Objectives and general methods

2.1 Objectives

The main focus of this dissertation is respectful maternity care in southern Mozambique and the role of the male partner. The following three aims, each with specific research questions, guided this dissertation:

The first aim is to **assess the implementation of respectful maternity care in southern Mozambique, including the role of the male partner**. The following research questions will be answered:

1a. To what extent are the principles of respectful maternity care implemented in Maputo City and Maputo Province?

1b. What are potential contributors to the occurrence of D&A during childbirth (from the providers' perspective).

The second aim is to **assess the role of the male partner during pregnancy and childbirth in southern Mozambique and explore barriers for male involvement**.

2a. What are barriers and facilitators at policy level, provider level and community level for involving men during pregnancy and childbirth in Mozambique.

2b: What are current practices of men and level of knowledge of danger signs during pregnancy and childbirth in the community in southern Mozambique

The third aim is to explore **the conceptualisation of male involvement in maternal health from a global perspective**.

3a: Which definitions and indicators have been used in the scientific literature in the last 20 years for assessing male involvement in maternal health.

3b: What are the most relevant and evidence based indicators for measuring male involvement in maternal health from a global perspective.

2.2 General methods

To answer the research questions and study objectives of this dissertation, several data-collection methods and data sources were used, namely quantitative surveys, in depth individual interviews, focus group discussions, a systematic review of the literature and a Delphi study. For clarity and coherence, we will briefly describe the rationale for the chosen approaches and methods in this section. A timeline giving an overview of the data collection period of each study can be found in table 1 at the end of this section. For detailed information regarding the used methods and analysis of each study we refer to the next chapters and information in the publications.

Every aim was explored by mixing quantitative and qualitative data because we believed that neither quantitative nor qualitative methods were sufficient to achieve the particular research aims. Mixed methods is a procedure for collecting, analysing, and "mixing" or integrating both quantitative and qualitative data at some stage of the research process within a single study for the purpose of gaining a better understanding of the research problem [154, 155]. While every aim of our research was explored by a mix of qualitative and quantitative data and examined by a mixed method approach, we decided to publish results in different publications (and not as one mixed method study) because of the word limit of journals and differing time lines of analysis and publication. Nevertheless, we published intertwined studies in the same journals and referred to one and other within the publications for emphasizing the coherence of the different studies.

1) Assess the implementation of respectful maternity care in southern Mozambique and in particular the role of the male partner

   The study design for exploring the first aim was a sequential explanatory mixed method design[156, 157], First quantitative data was collected, more specifically a quantitative survey among women on the maternity ward in two different settings regarding the provision of respectful maternity care. The study used a cross sectional design, examining the prevalence of disrespect and abuse in two different settings (urban versus semirural) by interviewing women in the first days after childbirth about their experience of the care provided during childbirth. This data supported the design of the second study (and second research question), namely examining potential contributors to the occurrence of disrespect and abuse (D&A) from the perspective of midwives. This study used focus group discussions to obtain the knowledge, perspectives and attitudes of midwives about RMC, and seek explanations for the occurrence of D&A. Because of the sensitive nature of the topic, which

might be difficult to explore by direct questions in one-to-one interviews, Focus Group Discussions (FGDs) were chosen as the most suitable method of data collection[158]. We selected homogeneous FGDs (by organising a different FGD for the head midwives) to stimulate confidence among individual group members in voicing their own views [159]. Contrary to the first study, FGDs took place with midwives in one setting, based on the assumption that midwives often have worked in various places and can also reveal potential contributors in other settings than their current working environment.

2) Assess the role of the male partner during pregnancy and childbirth in southern Mozambique and explore persistent barriers for male involvement.

The second aim was explored by conducting a situation analysis regarding male involvement in maternal health in southern Mozambique, consisting of a mix of quantitative and qualitative data, for which an exploratory sequential design was used[160]. Firstly, qualitative data was collected in two semirural districts at different levels to explore policymakers, health providers and community perspectives regarding male involvement in maternal health in Mozambique. Semi-structured observations, in depth interviews and focus group discussions were used as data collection method. These findings lead to the answer of research question 1.

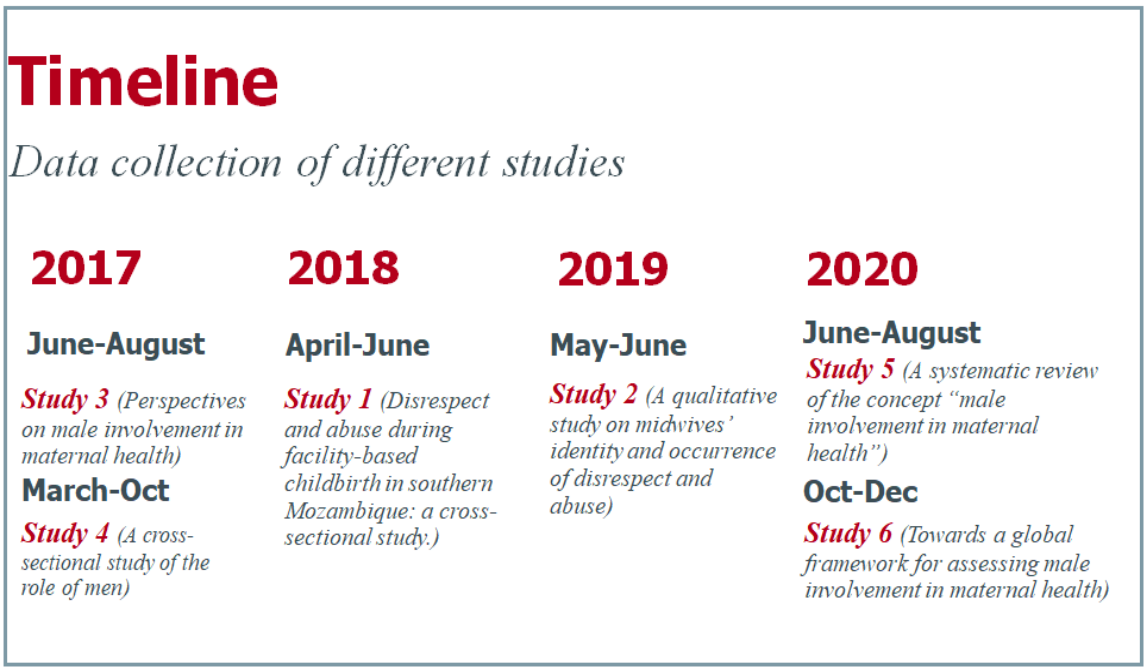
The preliminary results of this qualitative analysis were used to direct the next quantitative phase, consisting of a household survey in the same setting regarding the role of men during pregnancy and childbirth. Questions for this survey were formulated based on the existing literature and preliminary findings of the observations and interviews from the qualitative phase. Furthermore interpretation of the results of this household survey was facilitated by the knowledge gained during the qualitative data collection. Findings of this cross sectional household survey were used to formulate a response to research question 2.

3) Explore current definitions and indicators of male involvement in maternal health from a global perspective

The third aim was achieved by conducting a quantitative systematic review (for answering research question 1) and modified Delphi study (for answering research question 2). An explanatory mixed method approach was used, meaning that the findings of the systematic review were further refined by means of a Delphi study.

In the systematic review we focused on quantitative studies and likewise only quantitative analysis were conducted (including descriptive statistics, inferential statistics and text mining). Immediately after obtaining the results of the systematic review, a Delphi study was conducted to refine the findings and receive input from experts globally. While a Delphi study is considered as a mix of quantitative and qualitative data collection[161, 162, 163], the qualitative findings were most dominant for the final conclusions.

Table 1 A timeline indicating the data collection period of every study included in this dissertation



Chapter 3

The implementation of respectful maternity care in southern Mozambique, including the role of the male partner

3.1 To what extent are the principles of respectful maternity care implemented in Maputo City and Maputo Province?

Disrespect and abuse during facility-based childbirth in southern Mozambique: a cross-sectional study.

BMC Pregnancy and Childbirth – Open Access – Published 22 October 2019

https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/s12884-019-2532-z

SUMMARY

What is already known?

-Worldwide, maternal health efforts have been shifted from an emphasis on boosting service utilisation to improving quality of care. The increased focus on quality of care has brought to attention the aspect of respectful maternity care, demonstrating many women experience disrespect and abuse worldwide when giving birth.

-The aspect of respectful maternity care is hardly studied in Mozambique, although several programs have been implemented to train health care providers regarding the core principles of respectful care for women during labour and childbirth.

What are the new findings?

-Our study showed that disrespect and abuse during childbirth was common in southern Mozambique although the prevalence of certain forms of abuse such a physical violence and bribing were rather low compared to the neighbouring countries.

-There was a huge difference in prevalence of disrespect and abuse between the district hospitals and referral hospital.

-Restrictive policies and lack of privacy made it impossible for the male partner to accompany the woman during childbirth, although the majority of women were in favour of having the male partner as a birth companion.

What are the implications of the new findings?

-The occurrence of disrespect and abuse was much higher in the district emphasizing the high need for tailored interventions according to the context.

-Allowing male partners as birth companions should be explored further, as women seem in favour of involving their partners. Furthermore some studies indicate involving the male partner as birth companion might also be a protective factor against D&A.

Galle et al. BMC Pregnancy and Childbirth (2019) 19:369
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BMC Pregnancy and Childbirth

RESEARCH ARTICLE Open Access

Disrespect and abuse during facility-based childbirth in southern Mozambique: a cross-sectional study

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Abstract

Background: Evidence suggests that many women experience mistreatment during childbirth in health facilities across the world, but the magnitude of the problem is unknown. The occurrence of disrespect and abuse (D&A) in maternity care services affects the overall quality of care and may undermine women's trust in the health system. Studies about the occurrence of disrespect and abuse in Mozambican health facilities are scarce. The aim of this study was to explore the experience of women giving birth in hospital in different settings in Maputo City and Province, Mozambique.

Methods: A cross sectional descriptive survey was conducted between April and June 2018 in the Central Hospital of Maputo (HCM) and district hospitals of Manhiça and Marracuene, Maputo Province, Mozambique. Five hundred seventy-two exit interviews were conducted with women leaving the hospital after delivery. The questionnaire consisted of the following components: socio-demographic characteristics, the occurrence of disrespect and abuse, male involvement during labor and childbirth and intrapartum family planning counselling and provision.

Results: Prevalence of disrespect and abuse ranged from 24% in the central hospital to 80% in the district hospitals. The main types of D&A reported were lack of confidentiality/privacy, being left alone, being shouted at/scolded, and being given a treatment without permission. While very few women's partners attended the births, the majority of women (73-80%) were in favor of involving their partner as a birth companion. Intrapartum counseling of family planning was very low (9-17%).

Conclusion: The occurrence of disrespect and abuse was much higher in the district hospitals compared to the central hospital, emphasizing the high need for interventions outside Maputo City. Allowing male partners as birth companions should be explored further, as women seem in favor of involving their partners. Investing in intrapartum counselling for family planning is currently a missed opportunity for improving the uptake of contraception in the country.

Keywords: Disrespect and abuse, Mozambique, Quality of care, Maternal health, Family planning , Male involvement

Introduction

Maternal mortality refers to deaths caused by complications from pregnancy or delivery. From 1990 to 2015, during the Millennium Development Goals (MDGs) era, the global maternal mortality ratio declined by 44% – from 385 deaths to 216 deaths per 100,000 live births, based on UN inter-agency estimates. Despite the fact that every region has advanced, the maternal mortality ratio is still very high in sub-Saharan Africa compared to the rest of the world [1]. Maternal mortality reduction remains a priority under in the new Sustainable Development Goals (SDGs). By 2030, the global community wants to reduce the global maternal mortality ratio (MMR) to fewer than 70 maternal deaths per 100,000 live births.

Global efforts during the MDGs era have largely focused on increasing antenatal care (ANC) coverage and

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facility-based childbirth as a key mechanism to reduce maternal mortality [2]. These efforts met with some success. There was much less emphasis on quality of care, although individual studies suggest that poor quality is limiting health gains [3, 4]. Improving quality of care, along with women's experiences of care, has been highlighted as a key strategy to further reduce preventable maternal mortality and morbidity and achieve the health-related SDG targets by the World Health Organization (WHO) [5]. In 2016, WHO published new guidelines for improving quality of care for mothers and newborns in health facilities, which included an increased focus on respect and preservation of dignity. Experience of care is as important as clinical care provision in achieving the desired person-centred outcomes in the WHO framework for improving quality of care for pregnant women during childbirth [5]. Recent evidence suggests that many women experience mistreatment and are abandoned during childbirth in health facilities across the world, but the magnitude of the problem is unknown [6–10]. An often cited framework for describing interpersonal aspects of care during labor and delivery are the seven domains of disrespect and abuse (D&A) defined in Bowser and Hill's landscape evidence review, published in 2010: physical abuse; non-consented care; non-confidential care; non-dignified care; discrimination; abandonment of care; and detention in facilities [11]. Afterwards The White Ribbon Alliance spread the Respectful Maternity Care Charter: The Universal Rights of Childbearing Women, a statement grounded in the Universal Declaration of Human Rights [12].

The mistreatment of women during childbirth often occurs at the level of the interaction between women and healthcare providers but deficiencies in the health care system (e.g. lack of adequate personal and poor infrastructure) also contribute to its occurrence [13–15]. The occurrence of disrespect and abuse in maternity care services may undermine women's trust in the health system and deter them from seeking facility-based care for delivery [16]. Disrespect and abuse during childbirth is more and more being recognized as an indicator of poor quality of care and cited as a key barrier in achieving better maternal health outcomes [17].

Mozambique, with a maternal mortality ratio of 489 maternal deaths per 100 000 livebirths in 2015 and only 54% of births attended by a skilled birth attendant, is one of the priority countries for improving maternal health [18]. Several actions have been taken and progress is ongoing but slow. Recognising the importance of quality of care, since 2007 the MoH (Ministry of Health) of Mozambique has made humanization and patient friendly care during ANC and delivery one of its priorities [11]. Over time, the culture of promoting Respectful Maternity Care (RMC) has become more widespread in Mozambique and the MoH has transformed a selection of maternity wards into centers of quality and humanized Maternal and Newborn Health (MNH) care provision under the "Iniciativa Maternidade Modelo" (Model Maternity Initiative). Respectful maternity care is one of the essential packages of the model and includes respect for beliefs, traditions, and culture; the right to information and privacy; choice of a companion; freedom of movement and position; skin-to-skin contact and early breastfeeding; appropriate use of technology and effective lifesaving interventions; and prevention of violence and disrespectful care [11]. By 2017 the initiative was implemented in all hospitals (central, provincial and district) within the country and almost half of the health centres [unpublished report JHPiego & MoH]. However, no evaluation has been conducted so far from the perspective of users after introducing this model. Studies examining the prevalence of disrespect and abuse in maternity care in Mozambique are scarce, especially in comparison to other countries in the region like Tanzania, South-Africa and Kenya [12, 15, 19, 20]. Recognizing that poor experiences for women might lead to less deliveries in the facilities and affect the quality of care by several pathways, this study aims to assess the experience of women giving birth in hospital in different settings in Maputo City and Province, Mozambique.

Methods

Data collection tool

A cross sectional descriptive survey was conducted between April and June 2018 in the Hospital Central de Maputo (HCM) and district hospitals of Manhiça and Marracuene in Maputo Province, Mozambique. HCM is a tertiary referral hospital with on average 20 deliveries a day. HCM is the only hospital in the country equipped to handle advanced operations, thereby serving as the last referral center for the entire country [21]. Manhica and Marracuene district hospital are secondary level hospitals with on average 10 and 5 deliveries a day, respectively. Self-referral and direct access is very common in all three facilities [22]. Exit-interviews were conducted with women leaving the hospital after delivery. The questionnaire consisted of the following components: socio-demographic characteristics, male involvement during labor and childbirth, intrapartum family planning (FP) services and experience of care. A normal delivery was defined as a vaginal delivery without the use of forceps, vacuum extraction or other medical interventions. A vaginal delivery involving a second degree tear or episiotomy was considered as a normal delivery. Experience of care was measured by using 23 verification criteria of disrespect and abuse, subdivided in the 7 categories, according to Bowser and Hill's landscape evidence review [6, 7, 9, 23]. The questionnaire was translated into Portuguese and can be found in attachment (see

Additional file 1). Four female data collectors, not involved in the women's care, were recruited and received a 1 week training regarding the study procedures, data collection tool and ethical research principles before embarking on data collection. All data collectors were trained to translate the questions from Portuguese to the local dialect (Changana) for participants who did not speak Portuguese.

Sample size

We wanted to measure the prevalence of disrespect and abuse in hospitals presenting different characteristics – in this case district hospitals and a referral hospital. A single population proportion formula was used to estimate the sample size with assumptions of 5% precision, 95% confidence, and a 10% non-response rate. An assumption that 20% of the women would experience some form of disrespect or abuse was made, based on other studies [24, 25]. The final calculated sample size was 246 for each type of facility (district vs central hospital), which resulted in a total sample size of 592.

Data collection procedure

We conducted exit interviews with women staying at the maternity unit: all women aged 18–45 years who had delivered at the participating hospitals and who spoke Portuguese or Changana, were invited for an interview. Minors were not included because additional procedures would be required for ethical reasons (e.g. consent of parents, closer follow up).

Data collection continued until the required sample size was reached. Every morning the data collectors visited the post-partum maternity ward and contacted the head nurse to know which women were ready for discharge. These women were approached and invited to participate in the study. Women were invited after the morning round to avoid presence of health care providers. If they consented to participate the interview took place in a private room in the hospital. The questionnaire was set up in Open Data Kit software and tablet computers were used for data collection.

The questionnaire and recruitment procedure were thoroughly pilot-tested prior to data collection. After the pilot test small adaptations were made to the questions to improve comprehensibility.

Ethical issues

Ethical approval was obtained from the National Health Bioethics Committee of Mozambique, Health Bioethics Committee of Universidade Eduardo Mondlane (UEM), Hospital Central de Maputo (CIBS UEM&HCM/0008-17) and from the Bioethics Committee of Ghent University (EC/2018/1319). All data collectors were trained in data collection procedures and ethical conduct. During the study data collectors were supervised on a daily basis by the principal investigator (AG). Written informed consent was obtained separately for each study participant. All participants were given detailed information about the study and contact details for further information, concerns or questions after participation.

Prior to the start of the study a meeting was organized with the management team of the delivery ward and maternity ward in all study sites to discuss the objective of the study and data collection procedures. Afterwards the management team introduced the study and research team (principal investigator, supervisor and data collectors) to the head nurse of the maternity ward.

Data analysis

All data was analyzed using the statistical software package R. Simple descriptive analysis was done to explore sociodemographic characteristics of the population. Differences in socio-demographic characteristics by place of delivery (district versus central hospital) were examined using Pearson's Chi squared test. Disrespect and abuse (D&A) during childbirth were operationalized using the seven categories described in Bowser and Hill's landscape analysis [6] (see Table 2). In line with global consensus on describing and defining prevalence from the perspective and experience of the woman [4, 7], prevalence of each of D&A category was calculated using the exit interview data. Women who reported experiencing one or more sub-components of D&A were included in the overall prevalence measure.

While previous studies mostly focus on the outcome "experiencing at least one kind of abuse (yes or no)", we also took into account the number of forms of violence a woman experienced in our analysis. Most women experienced several forms of abuse, which would be masked by using a binary outcome variable for D&A. The sum score of experiencing D&A for each woman was calculated (varying from 0 to 7) and this variable was used as outcome variable in our negative binomial model. Independent variables for our model were chosen based on the hypotheses that women from certain subgroups (low educational level, single women, young women, women from rural areas) may be more likely to experience and/or report D&A. The reported intercept (often labeled the constant) is the negative binomial regression estimate when all variables in the model are evaluated at zero [26].

Results

In total 932 women gave birth during the study period and 628 women were approached for an interview. The main reasons that some women were not invited to participate were their bad health condition or that they went home very soon after birth (< 24 h). Of the 628

women that were invited for the study, 572 participated. The main reason for not participating when invited was being < 18 years old ($n = 36$); other main reasons were not interested or not feeling well. During data cleaning 52 data entries had to be removed because of poor quality and/or incompleteness, resulting in a final sample of 520 women (see Fig. 1). The final dataset did not contain missing data. Sociodemographic characteristics of the participants can be found in Table 1.

Sociodemographic characteristics

In total 145 women participated in the study from the Manhiça district hospital, 73 from Marracuene district hospital and 302 from the central hospital (=HCM). In the central hospital 28.48% of the women completed higher education and 10.60% finished secondary school. In the district hospitals 0.92% completed higher education and 1.38% secondary school. There was a significant difference between women who delivered in the district hospital compared to women who delivered in the central hospital regarding education, education of the partner, religion, age and type of delivery. Overall, women in the central hospital were higher educated, older and had more complicated pregnancies and caesarean sections (see Table 1).

Experience of care

Of the 302 women interviewed in HCM, 23.51% ($n = 72$) reported at least one kind of abuse or disrespect during labor and/or delivery. In the district hospitals the percentage was significantly higher ($X^2 = 159$; d.f. = 1; $p =$ 2e-36): 79.82% ($n = 174$) of the women reported at least one form of disrespect or abuse. No significant difference was found in prevalence of disrespect and abuse between the two district hospitals ($x^2 = 0.36$; d.f. = 1; $p = 0.55$). Design effect was 0.1904, which is very low (rho = – 0.0054; deff = 0.1904). Between each district hospital and the central hospital the difference in prevalence of D&A was significant as we expected at the start of the study: HCM/Manhiça ($x^2 = 83$; d.f. = 1; $p =$ 6.6e-20) and HCM/Marracuene ($x^2 = 65$; d.f. = 1; $p =$ 7.7e-16).

The provision of non-confidential care (=lack of confidentiality), non-consented care (=services without permission) and abandonment were the most common types of disrespectful care during facility-based childbirth in the district hospital, followed by non-dignified care (=disrespectful treatment) (see Fig. 2). In the central hospital abandonment and non-dignified care were the most prevalent forms of D&A (see Fig. 2). Prevalence of each type of disrespect and abuse can be found in Table 2. Five women mentioned they gave birth alone because nobody came when they called for help (mentioned in category abandoned as "others"). Two women felt disrespected because they had to watch other women giving birth and two women felt disrespected because they had to clean up the bed after delivery (mentioned in category disrespectful treatment as "others").

Experience of multiple forms of disrespect and abuse

The average number of forms of D&A each woman experienced was 1.70 in the district hospital and 0.31 in the central hospital. Women in the district hospitals experienced on average 1.4 more forms of D&A compared to the central hospital, the difference between the two types of site was significant (t = 20, df = 300, p-value <2e-16). While women in the central hospital experienced a maximum of 3 forms of D&A, women in the district hospitals experienced a maximum of 5 forms of D&A (see Fig. 3).

We explored which sociodemographic characteristics were associated with experiencing multiple forms of disrespect and abuse by building a binomial negative regression model for both the district hospital and central hospital. Taking into account the AICs (Akaike Information Criterion)[27], a model was selected with the number of forms of disrespect (varying from 0 to 7) as outcome variable and age, marital status, type of

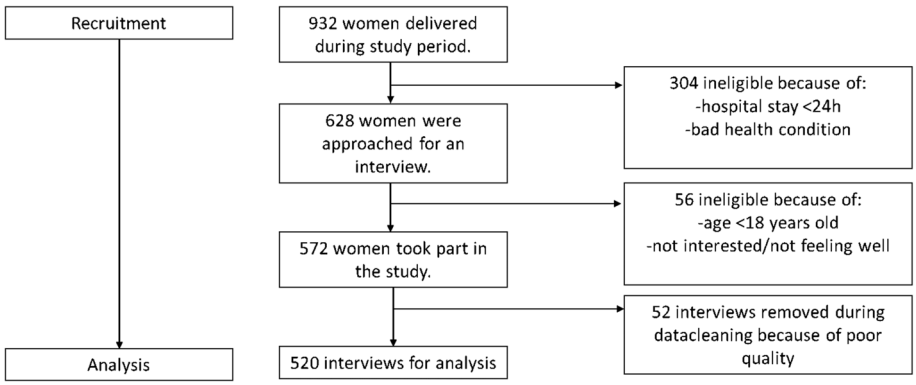

Fig. 1 Flow diagram showing process for inclusion in data analysis

Table 1 Sociodemographic characteristics

Site	District Hospitals (*N* = 218)		Central Hospital (*N* = 302)		*p*-value (x^2 test, df)
Educational level woman**	n	%	n	%	*p* = 4e-27 (x^2 = 126, d.f. = 3)
No education	40	18.35	3	0.01	
Primary school (at least 1 year)	173	79.36	181	59.93	
Secondary school	3	1.38	32	10.60	
Higher education	2	0.92	86	28.48	
Marital Status	n	%	n	%	*p* = 0.38 (x^2 = 0.77, d.f. = 2)
Single	48	22.02	61	20.20	
In relationship	167	76.61	241	79.80	
Divorced	3	1.38	0	0	
Educational level partner**	n	%	n	%	*p* = 2.8e-29 (x^2 = 140, d.f. = 4)
No education	7	3.21	1	0	
Primary school (at least 1 year)	135	61.93	132	16.23	
Secondary school	3	1.38	28	9.60	
Higher education	11	5.05	126	41.39	
Don't know	62	28.44	15	4.97	
Religion**	n	%	n	%	*p* = 4.5e-15 (x^2 = 80, d.f. = 6)
Catholic	25	11.47	74	24.50	
Islam	6	2.75	31	10.26	
Zione	58	26.61	17	5.63	
Protestant	91	41.74	131	43.38	
Independent Christian church	33	15.14	27	8.94	
No religion	3	1.38	0	0	
Others	2	0.92	22	7.29	
Age**	n	%	n	%	*p* = 0.00045 (x^2 = 18, d.f. = 3)
18-21	66	30.28	46	15.23	
> 21-25	48	22.02	71	23.51	
> 25-35	80	36.70	148	49.01	
> 35	24	11.01	37	12.25	
Type of delivery**	n	%	n	%	*p* = 7e-10 (x^2 = 42, d.f. = 2)
Normal	194	88.99	195	64.57	
With complications	16	7.34	49	19.21	
Caesarean section	8	3.67	58	16.23	

Levels of significance with the chi-square test:. = $p < 0.1$; * = $p < 0.05$; ** = $p < 0.01$

delivery, educational level and parity as predictors. Religion and educational level of the husband were also included as covariates but eliminated during model selection as these sociodemographic characteristics were not significant and reduced validity of the model. Table 3 shows the descriptive statistics of the explanatory variables (=predictors).

In the district hospital having a caesarean section decreased the number of disrespect with 1.26 (see Table 4). In the central hospital (see Table 5) having a delivery with complications increased the number of D&A with 0.65. Also having completed primary education increased the number of D&A with 0.80. Also age was a significant predictor, younger women experienced significantly more D& A. Every year older decreased the number of D&A with 0.05 (see Table 5).

Role of the partner

One man was present during labor and delivery in Marracuene district hospital, and no men were present in Manhiça. In HCM no men were present, this is officially not permitted in this hospital.

Women were asked if they would like to have their husband as their companion during labor and/or delivery

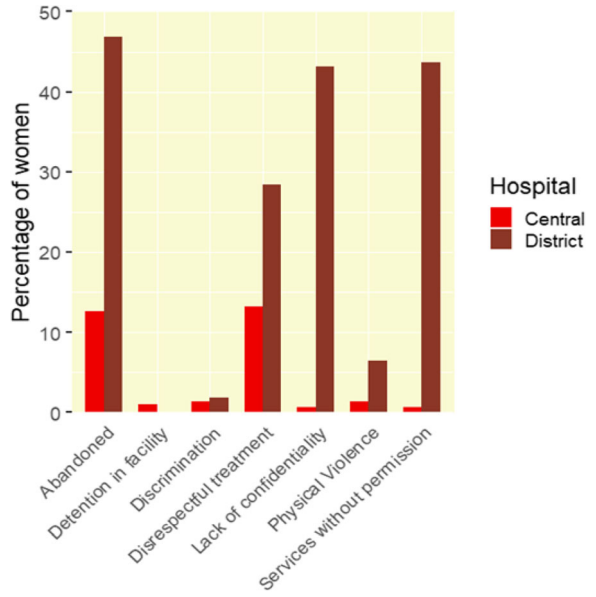

Fig. 2 Percentage of women experiencing D&A by category in the district hospitals and central hospital

(if allowed). The results showed that 79.47% ($n = 240$) of the women in HCM would like their husband to be present and 62.84% ($n = 137$) of the women in the district hospitals. The women were also asked if they thought their husbands would be willing to be their companion, 72.85% ($n = 220$) of the women in HCM and 41.74% ($n = 91$) of the women in the district hospitals believed their husbands would like to accompany them.

Family planning in the immediate postpartum

Family planning was discussed by the provider with 8.94% ($n = 27$) of the women during their stay in HCM and with 15.60% ($n = 34$) of the women in the district hospitals. Of the women in HCM 0.99% (n = 3) received a contraceptive method. In the district hospitals 1.83% ($n = 4$) of the women received a contraceptive method. Which methods were discussed and provided can be found in Table 6.

Discussion

The prevalence of disrespect and abuse in our study was similar to the prevalence in other countries in the region: 23.51% in the central hospital and 79.82% in the district hospitals. Studies from Ethiopia, Kenya and Tanzania report D&A prevalence rates between 20 and 70% [9, 12, 17, 20]. However, it may be problematic to focus only on overall prevalence of D&A as an outcome, as this covers a wide range of forms of D&A that are very different in nature (e.g. injections without permission versus slapping and beating). In this study we found that more severe forms of abuse such as detention in the facility (for failure of paying) and physical violence (such as slapping) are almost non-existent in the study sites in Mozambique, while studies conducted in other countries often report much higher figures. For example, a systematic review of D&A in Ethiopia estimated a prevalence of 13% for physical abuse and 3.2% for detention in the facility [28]. The implementation of the "Iniciativa Maternidade Modelo" might have contributed to this positive result in Maputo City and Maputo Province and further efforts should focus on reducing abandonment (when the patient is being left alone) and disrespectful treatment (being shouted/scolded at), which continue to be prevalent.

The occurrence of D&A in maternity care services is often considered as a marker for quality of care: it might affect quality of care in both terms of discouraging women to deliver in facilities but also directly through inadequate monitoring during childbirth (eg. infrequent fetal monitoring during labour and delivery, or absence of a skilled provider for resuscitation of the newborn or to intervene in case of bleeding of the mother) [14]. Several participants in our study reported they delivered alone in the health facility, which imposes a serious risk on both mother and child. This might also indicate that the number of women delivering without a skilled birth attendant is probably under reported in the region. Mozambique is struggling with a weak health system, characterized by poor health infrastructure, shortage of providers and insufficient supervision [29]. Certain forms of D&A (abandonment and lack of privacy) we found to be common might be triggered or worsened by resource scarcity within the health system. The inadequate health system resources (lack of separate rooms, insufficient skilled providers) are probably a major contributing factor to certain forms of D&A and prevention should be oriented at this level.

Stigmatization and emotional abuse of women by providers (discrimination of primigravidas due to being unexperienced, slanderous remarks, lack of privacy regarding age) are also a prevalent problem in maternity care in Mozambique, according to our results. Discrimination and stigmatization of certain subgroups in health care settings have been studied mostly in high income countries. The problem has much less been studied in low income countries and has had a strong focus on minority groups and HIV stigmatization [30, 31]. The role of medical education (e.g. training to shape the attitudes of providers) in prevention of discrimination in health care settings may be well recognized, especially in high-income countries, but it is inadequately explored in the context of D&A [10, 32]. On a global level, countries with strong colonial roots often have a health system culture where providers morally instruct and educate

Table 2 Prevalence different forms of D&A

Site	District Hospital		Central Hospital	
	n	%	n	%
Services without permission				
Caesarean section	1	0.46	1	0.3
Episiotomy	1	0.46	0	0.0
Stitching	14	6.42	0	0.0
Blood transfusion	0	0.00	0	0.0
Sterilization	0	0.00	0	0.0
Injection	82	37.61	0	0.0
Shaving	0	0.00	0	0.0
Others	1	0.46	1	0.3
No	123	56.42	300	99.3
Lack of confidentiality				
Disease (HIV)	1	0.46	0	0.0
Age	3	1.38	0	0.0
Medical history	0	0.00	0	0.0
Absence or position of the father	0	0.00	0	0.0
During labour and delivery	89	40.83	1	0.3
Others	1	0.46	1	0.3
No	124	56.88	300	99.3
Disrespectful treatment				
Threatened with C-section	5	2.29	7	2.3
Scolded, shouted at	57	26.15	30	9.9
Slanderous remarks	6	2.75	2	0.7
Blamed or intimidated	3	1.38	1	0.3
Others	1	0.46	7	0.3
No	156	71.56	262	86.8
Physical Violence				
Beaten, slapped or pinched	0	0.00	0	0.0
Tied down or restrained	0	0.00	0	0.0
Episiotomy sutured without anesthesia	14	6.42	2	0.7
Sexually abused by health worker	0	0.00	0	0.0
Others	0	0.00	2	0.7
No	204	93.58	298	98.7
Discrimination				
Ethnicity	0	0.00	0	0.0
Young and unexperienced	3	1.38	0	0.0
Single motherhood status	0	0.00	0	0.0
HIV sero-positive status	1	0.46	0	0.0
Low socio-economic status	0	0.00	2	0.7
Others	0	0.00	2	0.7
No	214	98.17	298	98.7
Detention in facility				
Unpaid bills mother	0	0.00	1	0.3
Unpaid bills baby	0	0.00	0	0.0

Table 2 Prevalence different forms of D&A *(Continued)*

Site	District Hospital		Central Hospital	
	n	%	n	%
Others	0	0.00	2	0.7
No	218	100.00	299	99.0
Abandoned				
Left alone unattended too often	76	34.86	22	7.3
Denied birth companion	17	7.80	1	0.3
Birth attendant didn't intervene in urgent situations	0	0.00	1	0.3
Neglected because staff was exhausted	31	14.22	5	1.7
Others	5	2.29	11	3.6
No	116	53.21	264	87.4

their patients [14], which might contribute to the occurrence of D&A in Mozambique. This is in line with research that suggest that nurses' and midwives' inferiority in medical hierarchy and lack of power within their own professional and organizational structures might contribute to their need to dominate and control even more disempowered patients [13, 33]. When designing interventions to prevent D&A, a participatory approach with providers will be needed to explore the roots of their abusive behaviors towards women and identify ways to overcome them.

The overall prevalence of D&A in the district hospitals was much higher compared to the central hospital (79.8% vs 23.5%). Furthermore, we could demonstrate that women in the district hospitals more often experience a combination of different forms of disrespect and abuse compared to the central hospital. In our study the lower D&A prevalence in the central hospital compared to the district hospitals might be related to the fact that providers work under better circumstances in the central hospital. The central hospital is a teaching hospital with more supervision and control mechanisms than the district hospitals (e.g. extensive maternal death audits and

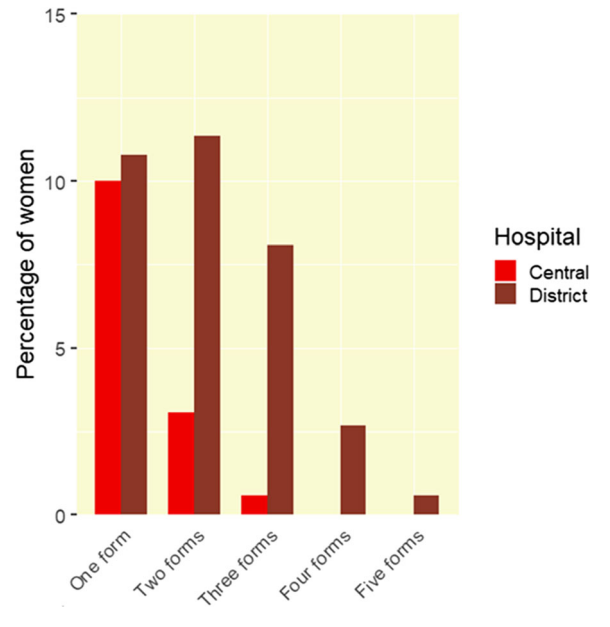

Fig. 3 Percentage of women experiencing multiple forms of D&A in the district hospitals and central hospital

Table 3 Descriptive statistics explanatory variables (predictors)

	Number of forms of violence			
	District Hospitals		Central Hospital	
	Mean	SD	Mean	SD
Educational level				
Primary level	1.72	1.25	0.22	0.50
Secondary or more	1.17	0.98	0.44	0.74
Number or pregnancies				
Primigravida	2.02	1.38	0.41	0.70
Multigravida	1.61	1.20	0.27	0.57
Type of delivery				
Normal delivery	1.76	1.22	0.27	0.61
Delivery with complications	1.62	1.45	0.47	0.68
Cesarean section	0.50	0.76	0.31	0.57
Civil state				
Single	1.7	1.13	0.31	0.62
In relationship	1.69	1.28	0.30	0.61
Age				
< =21 years	1.71	1.33	0.48	0.78
> 21 and = < 25 years	1.88	1.25	0.34	0.63
> 25 and = < 35 years	1.57	1.17	0.26	0.56
> 35 years	1.75	1.29	0.22	0.53

Table 4 Binomial negative regression model D&A in District hospitals

	Estimate	Std. Error	*z*-value	*p*
Effect:				
Intercept	0.55	0.15	3.58	0.00034 **
Number of pregnancies	−0.01	0.03	− 0.23	0.82
Having a C-section	−1.26	0.50	−2.51	0.01*
Having delivery with complications	−0.06	0.20	−0.31	0.76
Having completed primary school	0.42	0.38	−1.09	0.27
Being Single	0.01	0.13	0.12	0.91
Age	0.00	0.01	0.31	0.76

Levels of significance:. = $p < 0.1$; * = $p < 0.05$; ** = $p < 0.01$

academic meetings), and in general the maternity care system in Maputo City is better resourced than the rest of the country [34].

There is no consensus in the literature on the role sociodemographic and institutional factors play in the actual prevalence or reporting of D&A [9, 13, 19, 35]. Moreover, the influence of these factors might be very context specific [10]. This was confirmed in our study: sociodemographic factors played a different role in the central hospital compared to the district hospitals. In our study women with a secondary degree experience and/or report more forms of D&A [12]. This relationship might be related to the fact that these women expect higher standards of care and more easily recognize abusive behavior [12, 36]. Echoing the results of other studies, women in our study who had a delivery with complications reported more D&A [37]. Age was a protective factor against D&A in the central hospital. Several qualitative studies report that especially young and unexperienced women experience D&A due to power dynamics and low status [38, 39]. But they might also less easily recognize and report unacceptable behavior of providers, which might explain the contradicting findings in the literature. Nevertheless, more qualitative data from both women and providers will be needed to explore contributing factors regarding D&A in the Mozambican health system and specific context.

Labor companionship is a key component of providing respectful maternity care and has been included as one of the WHO standards for improving the quality of maternal and newborn care in health facilities [40]. Despite the benefits of a companion of choice throughout labor, implementation of this approach is not universal [41]. In Mozambique all maternities are officially obliged to allow birth companions since the introduction of the Model Maternity Initiative in 2017. However, in practice there are different rules depending on the provider (e.g. only women are allowed, no traditional birth attendants, only during the day, not able to switch) [experience in the field]. In most facilities in Mozambique it is strictly forbidden to allow male partners as birth companions during labor and delivery. This rule is partly linked with an overall lack of privacy on maternity wards (e.g. women deliver in beds next to each other in one room), which is perceived as more problematic when men are allowed to be present. However, as public facilities are improving more maternities now have separate rooms, and also in very small facilities privacy can often be guaranteed due to low numbers of births. Recognizing that the Respectful Maternity Care Charter and MoH policy state that women have the right to choose their own birth companion it is then contradictory to only allow female birth companions [42]. Also the World Health Organization recommends in their intrapartum guidelines that a parturient woman should be

Table 5 Binomial negative regression model D&A in central hospital

	Estimate	Std. Error	z-value	*p*
Effect:				
Intercept	− 0.12	0.60	−0.19	0.85
Number of pregnancies	−0.03	0.12	−0.26	0.80
Having a C-section	0.23	0.30	0.77	0.44
Having delivery with complications	0.65	0.28	2.34	0.02*
Having completed primary school	0.80	0.23	3.41	0.00064**
Being Single	−0.32	0.29	−1.10	0.27
Age	−0.05	0.30	−1.09	0.04*

Levels of significance:. = $p < 0.1$; * = $p < 0.05$; ** = $p < 0.01$

Table 6 Family planning methods

Site	District Hospitals		Central Hospital	
	n	%	n	%
Methods discussed				
Female condom	14	6.42	19	6.29
Male condom	12	5.50	18	5.96
Lactation amenorrhea Method	0	0.00	1	0.33
Oral contraceptives	29	13.30	13	4.30
Injectable contraceptives	24	11.01	11	3.64
IUD	16	7.34	18	5.96
Implant	26	11.93	24	7.95
Sterilisation	0	0.00	7	2.32
Others	1	0.46	2	0.66
Methods received				
Female condom	1	0.46	0	0
Male condom	1	0.46	0	0
Breastfeeding	0	0.00	0	0
Oral contraceptives	0	0.00	1	0.33
Injectable contraceptives	0	0.00	0	0
IUD	0	0.00	0	0
Implant	1	0.46	0	0
Sterilisation	1	0.46	2	0.66

encouraged to have a supportive companion she trusts and can feel at ease with in labor and birth [5, 43].

Our study found that a majority of women were in favor of involving their male partner as birth companion and many also believe their partners would be in favor. The desire of women to involve their male partner should be taken into consideration by maternities and might be a motive to reconsider current restrictions, where privacy can be guaranteed. Another argument for allowing men on maternity wards is that research suggests that disrespectful care would be less frequent if partners were present [44–46]. Birth companions in general are a protective factor against D&A [13, 19], and there is some evidence that bringing in the male partner might further protect the women against experiencing D&A. A study from Tanzania showed that male partners of women who experience abuse during labor or delivery find it easier to request better care or lodge a complaint than the women themselves [46]. Qualitative studies on experiences of men who have attended the births of their children in Malawi also showed that with a supportive environment and positive attitude of the midwives, it is possible to involve male partners during childbirth and for this to be a positive experience for both men and women [47, 48]. Further research is needed to explore the feasibility of allowing men in the delivery room in Mozambique and to examine potential strategies that create the ideal conditions for men to be present during labor and birth as the birth companion. It would also be interesting to examine whether involving men in maternity care might have an impact on the prevalence of disrespect and abuse during childbirth.

Offering modern contraception services as part of care provided during childbirth increases postpartum contraceptive use and is likely to reduce both unintended pregnancies and pregnancies that are too closely spaced [49]. It is recommended by the WHO standards for improving the quality of maternal and newborn care in health facilities [40] but very often neglected in studies examining quality of childbirth care [50]. Our study showed that both in the district hospitals and the central hospital the number of women receiving counselling about family planning was very low (17 and 9% respectively). For women with limited access to health care in facilities, delivery at a facility affords a unique opportunity to address their fertility intentions and need for contraception: it does not require a return visit that may be prohibitively expensive or inconvenient. Previous studies have shown that in the year following childbirth, many women want to postpone or avoid further births, but do not use a contraceptive method [51]. Offering family planning counselling before women leave the hospital might be an important and unique opportunity to protect women from an unplanned pregnancy, as only a minority of women (40-44%) return to the health facility for a postnatal care visit in Mozambique [18, 52]. Evidence has shown that discussing family planning before discharge from the maternity ward is an effective intervention to increase the uptake of family planning methods postpartum [53–56]. Mozambique has a comprehensive strategy to reduce the unmet need for family planning including guidelines for integrating family planning counselling and provision of contraceptives across the health service including during the intrapartum period [57–60]. However, increased attention is required to translate this policy into practice in order to improve uptake of family planning services in the post-partum period.

Limitations

Currently there is a lack of standardized definitions, instruments, and study methods to quantify D&A in childbirth facilities, which affects the generalizability and comparability of results [7]. A validated instrument, taking into account the severity of each form of abuse, is needed if we want to continue to compare overall prevalence of D&A across different countries and/or regions. Furthermore some reported forms of D&A might not actually constitute mistreatment: for example, giving an injection without permission or stitching a first degree tear without anesthesia might be justified under certain medical

conditions. A recent qualitative evidence synthesis also showed that RMC is a broader concept than merely the absence of mistreatment, although the two are intertwined [61]. While qualitative studies show that provider's and women's views on respectful maternity care are widely consistent globally, further research is needed to assess the validity and responsiveness of quantitative indicators to measure RMC [61].

Previous studies have shown that the factors that contribute to D&A in maternity care services and potential prevention measures are very context specific, which was confirmed in our study. We acknowledge that our study results cannot be generalized to other settings and further studies in different contexts in Mozambique are needed. Nevertheless we were able to show that D&A is a prominent problem in the country despite some significant quality improvement programs in maternity care over the last years.

We did not include minors, which is a limitation of our study. Data suggest that D&A and especially discrimination happen more often with adolescents, and our study found that increased age was protective against D&A. A follow-up study focusing on the occurrence of D&A in this specific group is recommended. In addition, our study was conducted inside the health institution, where social desirability bias can underestimate the occurrence of D&A. A community-based study might give women more freedom to express their feelings and report their experiences without fear, and eliminate this social desirability bias [62].

Conclusions

The overall prevalence of disrespect and abuse in our study was similar to the prevalence in other countries in the region but the more severe forms of abuse such as detention in the facility (for failure of paying) and physical violence (such as slapping) are almost non-existent. Occurrence of disrespect and abuse was much higher in the district hospitals. The majority of women were in favor of involving their male partner as birth companion and further research is needed to explore the feasibility of allowing men in the delivery room. Both in the district hospitals and the central hospital the number of women receiving counselling about family planning was very low. Investing in intrapartum counselling for family planning is currently a missed opportunity for improving the uptake of contraception in the country.

Supplementary information

Supplementary information accompanies this paper at https://doi.org/10.1186/s12884-019-2532-z.

Additional file 1. Questionnaire.

Abbreviations

ANC: Antenatal Care; D&A: Disrespect and Abuse; FP: Family Planning; HCM: Hospital Central de Maputo; MCHIP: Maternal and Child Health Integrated Program; MDGs: Millennium Development Goals; MMR: Maternal Mortality Ratio; MNH: Maternal and Newborn Health; MoH: Ministry of Health; RMC: Respectful Maternity Care; SDGs: Sustainable Development Goals; UEM: Universidade Eduardo Mondlane; WHO: World Health Organization

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Authors' contributions

AG developed the study protocol, collected data and drafted the manuscript. HM, EC and JP assisted in developing the data collection instruments and data collection. OD, KR, SG and NO assisted in data analysis and interpretation of the results. All authors revised the manuscript critically and read and approved the final manuscript.

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Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Ethics approval and consent to participate

Ethical approval for the study was obtained by both the National Health Bioethics Committee of Mozambique and Bioethics Committee of Ghent University. All participants gave their written consent.

Consent for publication

Not applicable

Competing interests

The authors declare that they have no competing interests.

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Publisher's Note

3.2 What are potential contributors to the occurrence of D&A during childbirth (from the providers' perspective)?

A qualitative study on midwives' identity and perspectives on the occurrence of disrespect and abuse in Maputo city.

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SUMMARY

What is already known?

-Disrespect and abuse during childbirth are widespread and many maternity providers have witnessed or engaged in disrespect and abuse of women during childbirth.

-Some initiatives have been taken to improve respectful care during childbirth in southern Mozambique but studies regarding providers' perspectives on the occurrence of disrespect and abuse are scarce.

What are the new findings?

-Midwives in southern Mozambique are struggling with their low position in the health system and in society and might fuel their frustrations on patients. In addition they do not seem adequately trained to handle stressful emergency situations and risk to conduct disrespectful behaviour when an obstetric emergency occurs.

- In our study we could not identify an intentional abuse by providers, making terms such as obstetric violence and abuse misplaced in this context.

-Supportive supervision and avoiding a blaming culture, seems key for mitigating D&A in health facilities, together with an increased respect for midwives (both by society and within the health system).

-Midwives are in favour of continuous labour companionship and are open for receiving men as companions when privacy can be respected.

What are the implications of the new findings?

-Better training and supervision of health care providers can contribute to avoiding D&A in obstetric care. A more positive approach to the problem (by using terms such as RMC instead of disrespect and abuse) is needed for avoiding further blaming of health care providers.

-Allowing male birth companions should be pilot tested within the hospitals, as there is a demand from women and their partners. Main barriers for male involvement during childbirth seem originated at the health system level.

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RESEARCH ARTICLE Open Access

A qualitative study on midwives' identity and perspectives on the occurrence of disrespect and abuse in Maputo city

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Abstract

Background: Midwifery care plays a vital role in the reduction of preventable maternal and newborn mortality and morbidity. There is a growing concern about the quality of care during facility based childbirth and the occurrence of disrespect and abuse (D&A) worldwide. While several studies have reported a high prevalence of D&A, evidence about the drivers of D&A is scarce. This study aims to explore midwives' professional identity and perspectives on the occurrence of D&A in urban Mozambique.

Methods: A qualitative study took place in the central hospital of Maputo, Mozambique. Nine focus group discussions with midwives were conducted, interviewing 54 midwives. RQDA software was used for analysing the data by open coding and thematic analysis from a grounded theory perspective.

Results: Midwives felt proud of their profession but felt they were disrespected by the institution and wider society because of their inferior status compared to doctors. Furthermore, they felt blamed for poor health outcomes. The occurrence of D&A seemed more likely in emergency situations but midwives tended to blame this on women being "uncooperative". The involvement of birth companions was a protective factor against D&A together with supervision.

Conclusion: In order to improve quality of care and reduce the occurrence of D&A midwives will need to be treated with more respect within the health system. Furthermore, they should be trained in handling obstetric emergency situations with respect and dignity for the patient. Systematic and constructive supervision might be another promising strategy for preventing D&A.

Background

Midwifery care has an essential role in the reduction of preventable maternal and newborn mortality and morbidity worldwide [1]. Over the last two decades, there have been calls to prioritize the intra-partum period and promote facility delivery to improve maternal and newborn health outcomes [1]. As a result, more women are delivering in a health facility with a skilled birth attendant [2, 3]. However, there is a growing concern about the quality of the care that women are experiencing inside health facilities and reports of disrespectful and abusive treatment during labour and delivery continue to appear in many parts of the world [4–6]. In light of these concerns, the World Health Organisation (WHO) published a new framework for maternal and newborn health in 2016, which included an increased focus on respect and preservation of dignity [7]. Based on this framework, experience of care is an essential element of quality of care, which requires competent and motivated human resources as well as the availability of essential physical resources [8]. According to WHO, health systems must be accountable for the treatment of women

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during childbirth, ensuring clear policies on rights and ethical standards.

Mozambique has a long history of civil war which compromised the development of a functioning health system, but since the signing of a peace agreement in 1992 the country has made significant progress in providing health for all [9]. Nevertheless, maternal and newborn health outcomes are still among the worst in Sub Saharan Africa. The most recent estimates report a maternal mortality ratio of 289 maternal deaths per 100 000 livebirths in 2017 [10] and only 54% of births attended by a skilled birth attendant in 2015 [11]. Several actions have been taken to improve maternal and newborn health in the last decade. After years of investing in scaling up the number of health care providers and health facilities [12], in 2007 the Ministry of Health (MoH) has made humanization and patient friendly care during antenatal care (ANC) and delivery one of its priorities, recognizing the importance of quality of care. Over time, the culture of promoting Respectful Maternity Care (RMC) has become more widespread in Mozambique and the MoH has transformed a selection of maternity wards into centres of quality and humanized Maternal and Newborn Health (MNH) care provision under the "Iniciativa Maternidade Modelo" (Model Maternity Initiative). The limited evidence shows most women (92%) in Southern Mozambique are satisfied about the interaction with the health care provider in maternity care and that the prevalence of disrespect and abuse (D&A) varies among settings and regions; from 27% in the referral hospital up to 70% in more rural facilities [13, 14]. The WHO defines the occurrence of D&A in childbirth as interactions or facility conditions that local consensus deems to be humiliating or undignified, and those interactions or conditions that are experienced as or intended to be humiliating or undignified [4].

Midwives are the key frontline health workers in providing maternal and newborn health care in Sub-Saharan Africa, operating in rural and urban areas in often challenging health systems. While most Low and Middle Income Countries (LMIC) have a well-defined rural health system, with a focus on primary care and often extensive cadres of community health workers and volunteers, the same structures rarely exist in cities [15]. Focusing on Maputo, the capital of Mozambique, the health infrastructure consists mainly of public facilities, some supported by non-governmental organizations (NGOs), and a smaller but increasing number of private clinics [16]. The city is facing a brain drain of health care workers from the public system to the private sector (including private clinics, development agencies and NGOs), where salaries and working conditions are much better [16, 17]. Continuity of care and functioning referral systems are a major challenge and appropriate gatekeeping to limit the number of patients using tertiary care who could be better served in primary care is limited. As a consequence, the daily challenges faced by midwives working in cities are likely to be different to those in rural areas.

Various cross sectional studies have explored the occurrence of D&A, listening to women's voices, both quantitatively and qualitatively [5, 14, 18, 19]. However, for designing effective prevention programs the drivers of D&A need to be explored together with the working environment in which disrespect occurs [20]. The limited literature on midwives' perspectives regarding D&A in maternity care indicates that organizational difficulties, lack of accountability and an ideology of patient inferiority are frequently cited causes of D&A [21–23] . Taking into account the increasing urbanization and modernization of most African cities, there is a need to explore the specific challenges midwives might face in urban public facilities and potential causes of D&A in these settings. Causes of D&A in urban settings may differ from those in rural areas as there is generally a more varied patient population, higher availability of doctors and provision of private care within and outside of the public hospital. With this study we aim to explore midwives' professional identity and perspectives on the occurrence of D&A in urban Mozambique.

Setting

Mozambique has a general shortage of health care providers but the MoH is gradually scaling up the number of health care workers as well as their professional training and availability and accessibility of postgraduate courses [24, 25]. The standardized national curriculum of midwifery education requires 4 years of studying, followed by continuous professional development through in-service training and refresher courses [24]. The study was conducted in Hospital Central de Maputo (HCM) in Mozambique's capital city. HCM is a tertiary referral hospital with on average 20 deliveries a day. On the delivery ward four midwives work each shift, together with one senior obstetrician and one junior resident. A full-time position as a midwife constitutes of 40 working hours. It is noteworthy that midwives in Maputo City often combine a job in the public sector with extra hours in the private sector to increase their income. HCM is the only hospital in the country equipped to handle advanced operations, thereby serving as the last referral centre for the entire country [26]. The principle investigator (AG) has been leading a cross sectional study about RMC in the same hospital [14] and was involved in various projects in the hospital between 2014 and 2019, witnessing the evolutions in terms of equipment, infrastructure and quality of care over this

period. The maternity ward has improved substantially between 2011 and 2018, through expansion of infrastructure and strengthened quality standards. While prior to 2016 there was just one delivery room with all women delivering side by side, all women in active labour now have separate rooms. Despite the scale up in terms of infrastructure, essential medicines and equipment are still scarce, and are stored centrally in the corridor. Over this period the hospital has transformed into a center of quality and humanized MNH care. Respectful maternity care is one of the essential packages of the model and includes respect for beliefs, traditions, and culture; the right to information and privacy; choice of a birth companion; freedom of movement and position; skin-to-skin contact and early breastfeeding; appropriate use of technology and effective lifesaving interventions; and prevention of violence and disrespectful care [12].

Research team

The principal investigator (AG) is a Belgian doctoral student with a midwifery degree and research experience in Mozambique. A final year medical student (HM) assisted during all focus group discussions (FGDs) with note taking and guiding the discussions.

Participants & study procedures

Data collection took place between May and June 2019. FGDs were chosen as the data collection method because we wanted to create a dynamic discussion about the professional identity of midwives and get different perspectives on D&A [27]. All midwives of the central hospital involved in obstetrical care were invited to be interviewed as well as the head midwives. FGDs took place with midwives of the delivery ward and the maternity ward, the majority of the midwives rotate among the wards and all are involved in obstetrical care. FGDs were conducted in a private meeting room in the hospital and took place at the end of midwives' shifts. In total 56 midwives were invited for the focus group discussions, of which two refused due to unavailability at the time of the interview. Head midwives were interviewed in separate FGDs to allow for openness among participants. All FGDs were facilitated in Portuguese by the researcher (AG), assisted by a local research assistant (HM). In the first part of the discussion midwives were asked how they felt about their profession, their role in the hospital and in society. The second part of the discussion focused on exploration of their understanding of respectful maternity care and the main reasons for the occurrence of disrespect and abuse during labour and delivery. The interview guide can be found as an additional file (see additional file 1).

Data analysis

All focus group discussions were transcribed verbatim in Portuguese by HM and were double-checked by AG. Braun & Clarke's six-phase framework was used during thematic analysis and open coding [28, 29] was applied. This framework involves a reflexive process of moving forwards (and sometimes backwards) through data familiarization, coding, theme development, revision, naming, and writing up [29, 30]. A grounded theory approach was used for the identification and progressive refinement of important themes from the data [31]. The final themes can be found in Fig. 1 and Fig. 2.

R Qualitative Data Analysis (RQDA) software, an R package, was used for coding. All data were coded by both AG and HM, all codes were discussed together after each FGD and divided into themes. All analyses were carried out in Portuguese. Only age ranges were reported along with quotations to guarantee anonymity.

Ethical considerations

The health directors and head midwives were contacted for authorization and assistance in organizing the FGDs. Information about the objective of the study and procedures was provided to all respondents verbally and in writing. Participants were asked if they consented to interviews being recorded using a tape recorder. Confidentiality, anonymity and ground rules were discussed before starting the FGD. Participation in the study was voluntary and all participants gave their written consent. No incentive was provided, other than refreshments during FGDs. Ethical approval for the study was obtained from the medical ethical commission of Ghent University (EC/2018/1319) and the Health Bioethics Committee of Universidade Eduardo Mondlane (UEM) and HCM (CIBS UEM&HCM/0008–17).

Results

In total 54 midwives participated in nine different FGDs (see Table 1). The number of participants per focus group ranged from five to seven. During analysis we identified two main themes: midwives' identity (summarized in Fig. 1), and factors affecting the occurrence of disrespect and abuse (see Fig. 2). While we report these themes separately for clarity, the two themes were clearly related to each other and sub themes often overlapped. In particular, the subthemes "underappreciated within hospital" and "being disrespected by others" intertwined and were part of the two core themes "midwives identity" and "the drivers of D&A" respectively. The coding structure and frequency of occurrence of each code in each interview can be found as additional files (additional files 2 and 3, respectively). The sociodemographic characteristics of the participants are shown in Table 1,

and emerging themes and sub codes are discussed below.

Midwives' professional identity and role in society

Pride in their work

Midwives all were proud of their work. They are involved in the process of bringing new life, which is a high responsibility and brings a lot of joy. This was described as follows:

> *"Being a midwife is not just a job, we are actually helping people. And we have to do it with our heart, that is most important."* (Midwife, FGD 5, age group 41–50).

Most women are also satisfied and happy after the delivery, and especially at the maternity ward the contact with women was told to be positive.

> *"Most women got what they came for. So they are happy."* (Midwife, FGD 6, age group 51–60).

Midwives reported being respected by their family and wider community, especially when they grew up in rural areas, where they were often regarded as educated and "medical doctors".

Gratitude by patients brought midwives satisfaction in their work and gave them motivation to overcome all challenges and difficulties.

Table 1 Socio demographic characteristics of participants

Sociodemographic characteristics	Participants % (n)
• 24–30	26.79 (15)
• 31–40	42.86 (24)
• 41–50	14.29 (8)
• 51–61	16.07 (9)
CHILDREN	
• Yes	83.93 (47)
• No	16.07 (9)
RELIGION	
• Catholicism	46.30 (25)
• Islam	1.85 (1)
• Cristian	31.48 (17)
• Others	20.37 (11)
POSITION WITHIN TEAM	
• HEAD MIDWIFE	22.22 (12)
• MIDWIFE	77.78 (42)
TOTAL NUMBER OF PARTICIPANTS	54

> *"As a midwife you are responsible for two lives, which is a huge responsibility, so you want to do it with perfection."* (Midwife, FGD 7, age group 31–40).

However, they also revealed that in the city they are losing this unanimous appreciation and linked this to broader access to information and services.

> *"Since they can look up everything on internet they believe they know better than us, they come and say I want this and this. They don't show respect anymore."* (Midwife FGD 1, age group 31–40).

Underappreciated within the hospital

Midwives disclosed that their work and efforts were not always appreciated within the hospital, especially compared to the appreciation and privileges that doctors received.

> *"Respect has to be mutual. I respect you, you respect me. If there is some kind of disrespect between the two the other one will not feel comfortable. And in this hospital, in this institution, midwives are not respected."* (Midwife, FGD 2, age group 31–40).

Doctors were treated better at the hospital by receiving small benefits such as better food at lunch or having cold water at their disposal. Other benefits exclusively for doctors mentioned included direct access to hospital services for relatives. Midwives perceived this preferential treatment as wrong. Younger midwives seemed to be especially bothered by the unequal treatment compared to doctors.

> *"Even our own hospital discriminates between doctors and midwives. Their room for refreshment is much better equipped, they always have water and also the food is much better than what we get."*(Midwife, FGD 5, age group 31–40).

However, it is important to mention that all midwives stated they felt respected by doctors in their direct working relationship. In the delivery room their opinions were heard and collaboration was mostly productive and with respect for each other. The problem was rather an institutional discrimination between the two professions. A strong bond among colleagues was one of the most important enablers for midwives to fulfill their job with positivity and satisfaction.

> *"For me a good day at work means you enter, say good morning and can talk and joke with your*

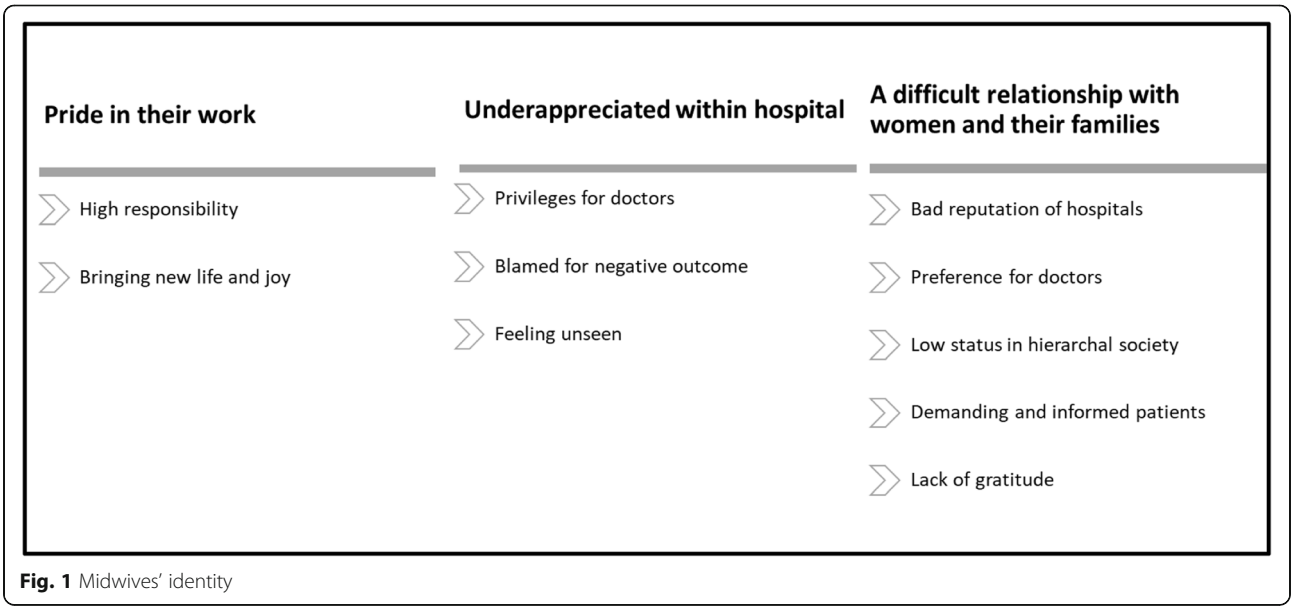

Fig. 1 Midwives' identity

colleagues in a good atmosphere." (Midwife, FGD 2, age group 24–30).

The hospital carries out security checks at the gate for everyone who enters or leaves the hospital, with no distinction made between patients, visitors or personnel. Medical personnel are often searched at the gate, which midwives perceive as very disrespectful and humiliating.

"At the end of the day we are tired and want to go home, but at the gate we are being searched by security guards, in front of our own patients. Just like we are thieves. That is humiliating." (Midwife, FGD 9, age group 24–30).

Midwives felt discriminated and targeted during audits for medical errors. Although doctors were also questioned during audits, midwives felt they were often held responsible for errors because they look after the patient, which they explained was a constant stress. They also perceived as wrong the fact that they are never informed of the results after an autopsy of a maternal death, while doctors are always informed. These events affect the team spirit in a negative way.

"When a medical error is found they will always point at us. Just because we are the lowest rank in the hospital. That is how it is." (Midwife, FGD 1, age group 31–40).

A difficult relationship with women and their families

A serious challenge in midwives' relationship with women and their families was linked to the poor reputation of public hospitals. The idea that many patients die *because of the hospital* (and not because of their health problem) is very prevalent in society.

"Most patients don't appreciate our work. They blame us for all their bad experiences with hospitals, it is all our fault." (Midwife, FGD 7, age group 24–30).

Insults and aggression by patients was a daily reality according to the midwives, mostly by upper-class patients who demanded a better service. In addition the midwives explained they often experienced aggression by women who were not able to cope with the pain (for example, slapping or scratching the hands of midwives during painful procedures). Midwives stated the hospital management did not recognize these challenges or offer any assistance. A big frustration was that patients can easily lodge complaints (in complaint boxes) but that nothing is in place for reporting problematic behaviour of patients towards health personnel.

The low status of midwives compared to doctors was also reflected in patients' behaviour. As doctors are available in the tertiary hospital, some patients prefer their opinion and even refuse to accept midwives as their carers during normal labour and delivery. Women with a high status in society in particular tend to disrespect the profession of midwives.

"Only by the time the woman has completed dilatation the doctor comes in and does the delivery. But I was following up that woman the whole day. Guess who they will thank? The doctor." (Midwife, FGD 7, age group 31–40).

Midwives mentioned they often felt treated as "servants" of the women. The existence of a private system in the public hospital tends to aggravate the problem. These patients expect a better service but they are treated in the same public hospital by the same health care providers (with limited time). In reality they only have a better equipped room which does not always meets their expectations.

> "*These private patients expect me to sit next to them and do everything, they don't want to get out of the bed. But I have 20 other women on the ward so I can only give her the same as all the others.*" (Midwife, FGD 6, age group 51–60).

Occurrence of disrespect and abuse

Triggers

Health system factors

Midwives mentioned that the lack of personnel is one of the major causes of why women are abandoned during labor and/or delivery. This is most problematic in rural health centers (where one nurse/midwife is often responsible for postnatal care, antenatal are, family planning and deliveries), but there are also some challenges associated with workload in the central hospital. Although it is a referral centre, there are not strict admission criteria which results in a very mixed patient population and high influx of patients. Midwives declared that they sometimes felt overwhelmed by complicated cases, especially during night shifts, which increased the risk of neglect.

> *"If you are dealing with three patients and one has eclampsia, another needs a caesarean section and the third suddenly has a haemorrhage, for sure one will be abandoned. "*(Midwife, FGD 2, age group 24–30).

They also linked this to the stress of being accused afterwards of making medical errors.

> *"When we have a lot of patients we have stress. But when we have mother that is not good we have a different stress, a psychological stress. Because we know she might end up dying on our ward, in our hands."* (Midwife, FGD 6, age group 41–50).

Being disrespected by others

Midwives explained that the disrespect they receive from others will affect their relationship with the patient. During rounds in the mornings they were often blamed for mistakes.

> *"You have to start the day and they [management/ superiors/peers in the hospital] already insulted you. And this will affect your work with the patients, because your head is not there, it's full already. They stressed you so basically your day is ruined already. And you will put your frustrations on the patient, it is the patient who will pick up the bill."* (Midwife, FGD 3, age group 31–40).

Gender-related disrespect by patients was also mentioned by one midwife.

> *"They might just slap or scratch you when you are working. You think they would do the same to a man? I don't think so. It is just because we are women."* (Midwife, FGD 1, age group 31–40).

They also mentioned problems with visitors who did not want to respect the visiting hours on the maternity ward. It was not unusual for midwives to have to call the security guards for assistance.

Fear of bad neonatal outcome

At critical points such as expulsion, midwives wanted to minimize the time and maximize their control over the situation in order to guarantee a good outcome.

> *"If we are yelling at the mother it's mostly for the interest of the baby. And the mother will even thank us for that afterwards."* (Midwife, FGD 1, age group 24–30).

If the expulsion phase is taking too long they were convinced that it is necessary and acceptable to use force. Surprisingly, midwives unanimously tend to blame the women for a difficult delivery. They explained this might happen because women do not "collaborate", or are too young or unexperienced.

> *"The women that say we slap them or yell, are the ones that don't collaborate. Even yesterday a mother was closing her legs and I lost control because the baby was suffering. I yelled at her: did you carry a baby for nine months to end up here closing your legs?"* (Midwife, FGD 3, age group 31–40).

Protective factors

Birth companions

Midwives highlighted the benefits of allowing birth companions, for both the midwife and the patient. They can calm and reassure the pregnant women during labour, check up on the mother, help with small tasks and also witness good care. They were convinced that this might improve the reputation of the hospital.

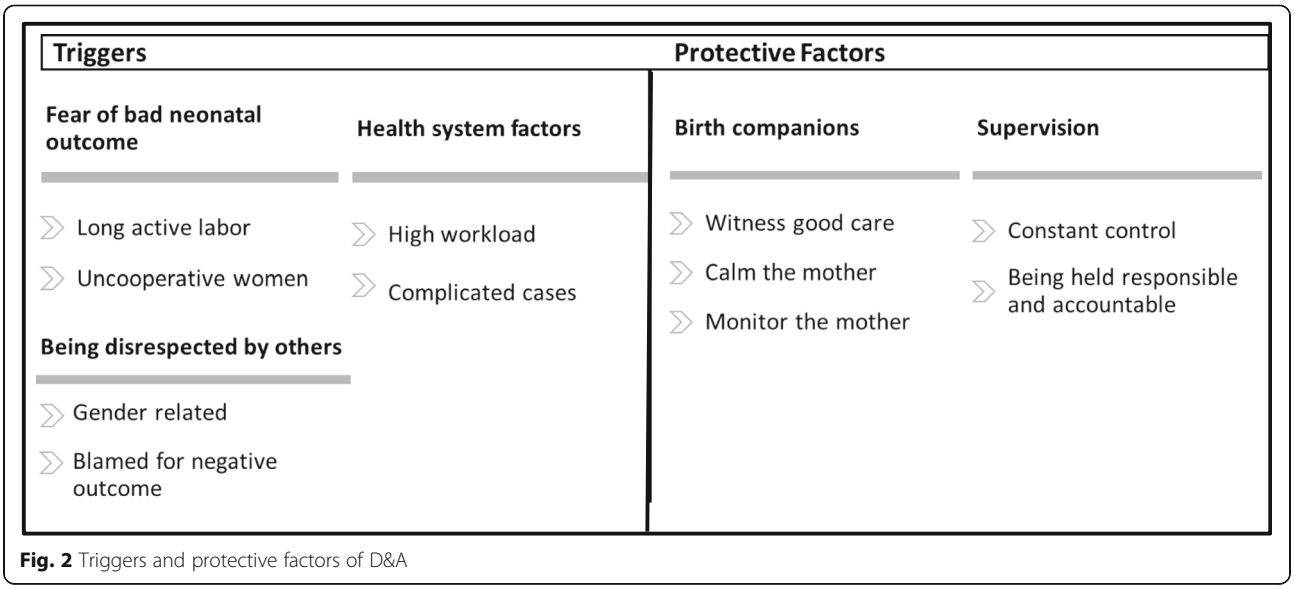

Fig. 2 Triggers and protective factors of D&A

"Bringing in birth companions was a good thing, they are seeing everything we do. They can see we are not beating the women. I hope they also tell that to the other mothers." (Midwife, FGD 8, age group 51–60).

They also explained that even when they use force or yell, the birth companions can witness that they had no choice and were providing the best care possible. Most midwives were also in favour of inviting male birth companions. They explained that some women are asking to allow their husbands on the ward, especially because this is already happening in many private facilities. However, some midwives explained that an unprepared man might also be traumatized or uncomfortable in the delivery room. Therefore, they proposed two main precautions before allowing men: preparation of the husband during ANC and introduction of stricter privacy measures (currently the doors of all rooms are always open to facilitate monitoring of women).

"Some women ask for their husband. But we cannot let them enter because we only have one corridor. Women walk half-naked and have contractions in the corridor. A man cannot see all that." (Midwife, FGD 7, age group (51–60).

Supervision and control

Although midwives clearly stated that the feeling of being controlled and checked all the time was a source of stress, they were convinced that this was one of the major reasons why the occurrence of D&A was relatively low in the central hospital. This in contrast to the districts where they described some level of immunity from punishment.

"That one in the district can just do what she wants. We have our head midwife correcting us on the spot". (Midwife, FGD 8, age group 41–50).

All midwives seem to respect their head midwife. Head midwives in the hospital are chosen by a voting system among midwives. Midwives appreciated this system because a higher medical degree does not automatically give someone a higher position. Midwives with good interpersonal skills and experience were most often elected. Besides supervision and control by colleagues and superiors also a complaint system for patients was in place (by means of complaint boxes in the hospital to report improper care).

Discussion

Being a midwife in a national referral hospital

Our study started by exploring the meaning of being a midwife in an urban referral hospital. We tried to capture how midwives felt about their profession and their social identity in society [32]. To start on a positive note, pride and awareness of their high responsibility in taking care of mother and baby were frequently emerging themes. This commitment and empathy was also described by Adolphoson et al. in 2016, interviewing midwives in different settings in Mozambique [33]. On the downside, the recent evolution of having more demanding and informed patients together with a parallel private system are factors putting pressure on midwives working in the public system.

Globally, midwifery is commonly described as highly emotional and challenging work, with midwives experiencing many work-related conflicts and medical dilemmas [34]. While the relationship of midwives with

doctors was generally good in our study, criticism and blaming by other colleagues (including midwives, doctors and superiors) eroded their morale. Other issues hampering job satisfaction were a lack of patients' respect and lack of institutional recognition and support for their work. Professional empowerment of midwives could be a useful strategy to increase job satisfaction and quality of care [35, 36], but specific evidence for implementing interventions in a Mozambican context is lacking. The "Perceptions of Empowerment in Midwifery Scale", a survey that has been implemented in various countries, could be a useful instrument to get more insight into the specific workplace factors affecting midwives empowerment in Mozambique [37–39] in order to inform the development of appropriate interventions.

Our study showed that the private health system clearly has an influence on the public system, for example patients expect higher standards of care, and some practices from the private system might influence the public system. However, current research and funding opportunities tend to focus on the public system only, resulting in limited evidence about parallel private systems and the interaction with public health systems. Greater emphasis and research on the influence of the private medical sector on the public sector is highly recommended, especially in these rapidly changing urban environments where the private health care system is growing [15]. Establishing effective public-private partnerships could be a way forward to improve quality of care, provided that they also guarantee universal access to health care [40].

Our study revealed that midwives are often blamed for negative health outcomes and are insulted within the hospital. Furthermore, the better working conditions for doctors were felt to be deeply unfair. Disrespect for midwives seems to be a global problem, WHO reported in 2016 that midwives often face discrimination, harassment and lack of respect worldwide [41]. Furthermore the WHO study showed that these negative experiences hinder midwives in their ability to provide quality care to women and newborns [41]. This was confirmed in our study, with midwives reporting that being insulted or disrespected by superiors at the start of their shift negatively affected their interactions with the patients for the rest of the day. Some authors have suggested that health care providers abuse patients to create a social distance and maintain identity and power in their continuous struggle to assert their professional and middle class identity in society [23]. While we lack evidence to apply this theory to the Mozambican setting, we can say that midwives in our study clearly struggled with their position in the institution and wider society. A clear non-discriminatory institutional policy and (peer) support system for health care providers could help increase job satisfaction for midwives and allow sustainable quality improvement of maternity care [42, 43]. Strengthening the national midwifery association could be a way forward to advocate for midwives' rights.

Enabling and protective factors of disrespect and abuse

After exploring the professional identity of midwives we explored their views on the occurrence of D&A in maternity care. We consistently use the terms "disrespect and abuse" in our study as defined by WHO [4]. Although other authors sometimes use the term "obstetric violence", we found in a previous study that the most common forms of D&A in the Mozambican context do not align with theories regarding violence or aggression [14]. According to WHO's definition [44], violence is always performed with the intent to harm. Our study showed midwives most important reason to use "obstetric violence" or conduct D&A was to save the baby's life, which is in line with other studies [22, 45]. We can argue they could and should use other techniques to save the baby, but still their primary intention is not to hurt the mother. Therefore, we purposely never used "obstetric violence" in our study and believe this term should be used with caution in the literature. Referring to obstetric violence within this context might compound midwives' feelings of being disrespected and blamed.

Relying on midwives' previous experiences working in other settings, we were able gain insight in factors affecting D&A in different settings. In our study midwives reported that the main reason for a higher occurrence of D&A in rural areas in Maputo Province is the lack of supervision and accountability in these working environments. As supported by the literature, strengthened supervision will be a way forward to prevent the occurrence of D&A and improve the quality of care [46, 47]. Some promising results have been achieved in other settings by establishing peer support and supervision groups to reduce stress and increase professional skills [42, 43, 48]. The election of head midwives within the team was found to be a positive element of supervision in our study and could be a promising strategy for establishing non-punitive supervision in other health institutions.

The occurrence of serious emergency situations and a high workload seem to be risk factors for the occurrence of D&A in our study. Especially when the midwife fears for the baby's health, she might use force to speed up the delivery (for example with fundal pressure during second stage of labor). Midwives in LMICs are not always trained and equipped to closely monitor fetal health, which increases uncertainty about the fetal condition and probability to intervene aggressively. In-depth counselling with the

women could make certain interventions less traumatic, but providers in LMICs also lack training and time to invest in counselling [49]. Furthermore, proper pain relief for women (such as epidural analgesia) is often absent. Despite numerous studies examining D&A, an association between serious emergency situations and the occurrence of D&A has been little explored. In line with the work of Afulani et al. [22], the narratives of our respondents show that stressful situations and not feeling capable to manage these situations are triggers for D&A. Furthermore, midwives tend to blame women for a difficult labour by reasoning they are too young or not collaborating. Further studies should look more into ways to avoid D&A during specific emergency situations such as foetal stress or obstructed labour. Furthermore, midwives' educational curriculum should include proper training about (pain) mechanisms during labour for avoiding such negative reasoning that might constitute to D&A. Some promising results have been found from the implementation of a workshop called "Health Workers for Change" in Tanzania covering reflection and discussion about different topics such as own values, women's status in society and overcoming obstacles at work [50]. The Population Council's Heshima Project in Kenya successfully used a similar approach [51]. While these training sessions have been implemented as in-service interventions for working midwives, it would be interesting to include and evaluate a similar module within the national curriculum for midwifery education.

Allowing birth companions during labour and delivery is highly recommended by WHO [52]. Our study confirmed the positive influence of birth companions for both the midwife and labouring women. Midwives believed birth companions can improve the reputation of the hospital by witnessing good care and have a positive influence on women's wellbeing. Currently only women are allowed as birth companions in almost all health facilities in Mozambique, although the Ministry of Health would like to allow men on all maternity wards in the country in the long term [53]. Midwives referred to the private hospitals as providing a good example in this matter by allowing male partners. Unfortunately, the public health system does not seem to be prepared yet to allow men on the labour ward. The measures proposed in our study (training providers, preparing male partners during ANC and maintaining privacy for all women) will require investments in terms of infrastructure and human resources.

Limitations

The setting of our study is limited to one hospital: a national referral hospital with very specific characteristics. This means that transferability beyond other similar settings is limited. However, while on the one hand we have findings that are very context specific (such as the interaction of midwives with patients that expect higher standards of care and prefer doctors), on the other hand we have findings that have been documented worldwide such as the vital role of supervision for tackling D&A [54] and importance of respect for midwives within the health system [41].

We lack evidence from the perspectives of doctors and health facility managers regarding their interactions with midwives and patients. Furthermore, the principle investigator of the study is a midwife herself, which may imply that the study only partially explores D&A from a limited perspective (that of midwives). Future research using triangulation of data coming from midwives, doctors, managers, women and their birth companions could reveal other perceptions about the essential aspects of respectful maternity care and ways to improve overall quality of care.

Conclusion

In our study we explored two broad themes – midwives' identity and occurrence of D&A – among midwives working in the national referral hospital of Mozambique. Results revealed some specific challenges for midwives working in a modernised capital in a LMIC. An increasing group of well-informed patients tended to show little respect or gratitude for midwives' work because they prefer doctors as health care providers and expect a better service. In addition, midwives often faced disrespect by superiors within the health facility and felt treated unfairly compared to doctors. Their feeling of being disrespected contributed to D&A as an act of projecting their frustrations on patients. The involvement of birth companions together with supervision seemed to protect against D&A, and having a head midwife for supervisory support was mentioned as good practice.

Our study adds evidence to the relationship between midwives' role and respect in society and the occurrence of D&A. It is important to recognize that midwives will need to be treated with more respect and dignity in Mozambique in order to guarantee the highest quality of care for mothers and their newborns. Only by guaranteeing availability of motivated and competent midwives equipped with essential physical resources can pregnant women and their newborns receive the highest standards of care as defined by the WHO framework for quality of care [8].

Supplementary information

Supplementary information accompanies this paper at https://doi.org/10.1186/s12884-020-03320-0.

Additional file 1. Topic Guide

Additional file 2. A plot of the coding structure

Additional file 3. Code frequency per FGD

Abbreviations
ANC: Antenatal care; D&A: Disrespect and abuse; FGDs: Focus group discussions; HCM: Hospital central de Maputo; LMIC: Low and middle income countries; MMR: Maternal mortality ratio; MNH: Maternal and newborn health; MoH: Ministry of health; NGOs: Non-governmental organisations; RQDA: R qualitative data analysis; UEM: Universidade Eduardo Mondlane; WHO: World health organization

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Authors' contributions
AG developed the data collection instrument, supervised data collection and drafted the manuscript. HM assisted in conducting the FGDs, transcription, coding and data analysis. OD, KR, SG and NO assisted in data analysis and interpretation of the results. All authors revised the manuscript critically and read and approved the final manuscript.

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Availability of data and materials
The dataset of the current study is available from the corresponding author upon reasonable request.

Ethics approval and consent to participate
Ethical approval for the study was obtained from the medical ethical commission of Ghent University (EC/2018/1319) and the Health Bioethics Committee of Universidade Eduardo Mondlane and Hospital Central de Maputo (CIBS UEM&HCM/0008–17). All participants gave their written consent.

Consent for publication
Not applicable.

Competing interests
The authors declare that they have no competing interests.

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Publisher's Note

Chapter 4

The role of the male partner during pregnancy and childbirth in southern Mozambique and persistent barriers for male involvement.

4.1 What are barriers and facilitators at policy level, provider level and community level for involving men during pregnancy and childbirth in Mozambique.

Policymaker, health provider and community perspectives on male involvement during pregnancy in southern Mozambique: a qualitative study

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SUMMARY

What is already known?

-Barriers to male attendance at antenatal care and broader involvement in maternal health operate at multiple levels and vary according to the context.

-Research from central Mozambique showed that a) gender inequality in decision making and b) community beliefs that male participation in ANC services reflects a woman's HIV-positive status are major barriers for male involvement in maternal health.

What are the new findings?

-Persistent gender inequality in and outside the health facility hamper successful implementation of male involvement programs

-The long standing association of men attending ANC services with being HIV positive is a serious barrier for male presence at ANC in southern Mozambique as well.

-External donors often focus on specific measurable health outcomes (such as male testing and male presence at ANC) when implementing male involvement programs in southern Mozambique.

What are the implications of the new findings?

-Couple oriented ANC consultations are needed to correspond to men and women's needs during pregnancy and childbirth, together with promoting gender equitable relationships between men and women in and outside the health facility.

-Male involvement programs should also focus on other aspects of men's role during pregnancy and childbirth than ANC presence and HIV testing for improving not only maternal health outcomes but also broader health outcomes.

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RESEARCH ARTICLE Open Access

Policymaker, health provider and community perspectives on male involvement during pregnancy in southern Mozambique: a qualitative study

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Abstract

Background: Increasing male involvement during pregnancy is considered an important, but often overlooked intervention for improving maternal health in sub-Saharan Africa. Intervention studies aimed at improving maternal health mostly target mothers hereby ignoring the crucial role their partners play in their ability to access antenatal care (ANC) and to prevent and treat infectious diseases like HIV and malaria. Very little is known about the current level of male involvement and barriers at different levels. This study explores the attitudes and beliefs of health policymakers, health care providers and local communities regarding men's involvement in maternal health in southern Mozambique.

Methods: Ten key informant interviews with stakeholders were carried out to assess their attitudes and perspectives regarding male involvement in programmes addressing maternal health, followed by 11 days of semi structured observations in health care centers. Subsequently 16 focus group discussions were conducted in the community and at provider level, followed by three in depth couple interviews. Analysis was done by applying a socio-ecological systems theory in thematic analysis.

Results: Results show a lack of strategy and coherence at policy level to stimulate male involvement in maternal health programmes. Invitation cards for men are used as an isolated intervention in health facilities but these have not lead to the expected success. Providers have a rather passive attitude towards male involvement initiatives. In the community however, male attendance at ANC is considered important and men are willing to take a more participating role. Main barriers are the association of male attendance at ANC with being HIV infected and strong social norms and gender roles. On the one hand men are seen as caretakers of the family by providing money and making the decisions. On the other hand, men supporting their wife by showing interest in their health or sharing household tasks are seen as weak or as a manifestation of HIV seropositivity.

Conclusion: A clear strategy at policy level and a multi-level approach is needed. Gender-equitable relationships between men and women should be encouraged in all maternal health interventions and providers should be trained to involve men in ANC.

Keywords: Male involvement, Maternal health, Male involvement policies, Mozambique

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Background

Antenatal care (ANC) plays a critical role in the health of pregnant women worldwide and is considered as a key entry point to receive preventive health care including nutritional support, prevention and treatment of several diseases (malaria, tuberculosis, neonatal tetanus, syphilis and HIV), as well as identification and management of potential complications during pregnancy [1, 2]. Moreover, during ANC visits women can receive counselling about family planning methods and postpartum care for themselves and their newborn [3]. In Mozambique, 93.3% of women go for at least one ANC visit during pregnancy, but only 54.6% receive the recommended four ANC consultations [4]. ANC services are provided free of charge but clinical, social, economic, and cultural barriers limit access to high quality ANC. These barriers include transportation problems, lack of social and financial support from family members and distrust in the health care system [5, 6]. Women are socially expected to ask permission from their male partners before making decisions about their own health care utilization [6]. Besides the husband, other key actors in the referral of pregnant women to the health services in southern Mozambique include matrons (influential older women), community health workers (CHWs), and neighbors [6]. Lack of spousal permission and fear of going to the clinic alone represented half of the reported barriers to ANC uptake in a national survey [5, 7].

Most interventions to improve maternal health and ANC uptake target mothers even though partners play a crucial role in women's ability to seek and obtain better antenatal care, to prevent and treat HIV infection that contributes to maternal mortality, and to reduce the incidence of obstetric complications [8]. Research in sub-Saharan Africa has demonstrated that fathers' involvement during pregnancy is associated with positive outcomes for the mother and baby, which include more antenatal care visits, participation in strategies to prevent vertical Human Immunodeficiency Virus (HIV) transmission, increased institutional delivery and better birth preparedness in case of pregnancy complications [9–15]. The signatories of the International Conference on Population and Development Programme of Action plan emphasized in 1994 that it is important for men to take more responsibility for their sexual and reproductive behavior and family life, and proposed that countries outline the responsibilities, plans and strategies for involving men in sexual and reproductive health [16]. In 2015 The World Health Organization (WHO) also recommended to include men in MCH (maternal and child health) programs in their recommendations on health promotion interventions for maternal and newborn health [17]. WHO states that male involvement interventions should be implemented in a way that respects, promotes and facilitates women's choices and their autonomy in decision-making and supports women in taking care of themselves and their newborns. Interventions to involve men in maternal health have been delivered through diverse mechanisms including community outreach and education, mass media social mobilization campaigns, the use of invitation cards for men to attend ANC, education for men only or for men and women together, home visits, and facility-based counselling for couples, groups or men only [15, 17].

Existing studies define the concept of 'male involvement' differently, indicating it is a subjective and multifaceted term [8, 11, 18, 19]. Most studies define male involvement as one or a combination of the following elements: active participation in maternal health services and care, financial support given for pregnancy-related and childbirth-related expenses and shared decision-making powers regarding maternal health issues [8]. While several studies have explored the role of partners in ANC uptake and engagement, this has not yet been explored in southern Mozambique. Research in sub-Saharan Africa showed that men perceived an unfriendly clinical environment and the negative attitude of providers as major barriers towards their engagement in maternity care [20]. Audet et al. (2015) examined male involvement in ANC in central Mozambique and two main barriers to increased male involvement in maternal health emerged: (a) gender inequality in decision making and (b) community beliefs that uptake of ANC services, particularly if supported by a male partner, reflects a woman's HIV-positive status. However, in general, southern Mozambique is significantly different socio-economically and culturally compared to the north and centre of the country, including in terms of gender dynamics and, consequently, facilitators and barriers to male involvement are likely to be different. Northern and parts of central Mozambique have a matrilineal marital, kinship and inheritance system while Southern Mozambique has a patrilineal system [21]. In a patrilineal system the woman moves to live with the husband's family after marriage, that pays a bride price to the woman's family in exchange. In this system women often have less power than in a matrilineal system because the man has "paid" for the woman and thus has power over her and their children [21].

The overall goal of this research was to explore the attitudes, practices and beliefs of health policymakers, health care providers and local communities regarding the benefits, challenges, risks and approaches to increase men's involvement during pregnancy in southern Mozambique.

Methods

Setting

The study was carried out by Ghent University in collaboration with the International Centre for Reproductive

Health – Mozambique (ICRH-M) and Universidade Eduardo Mondlane (UEM) between March and October 2017. ICRH-M is a Mozambican Non-Governmental Organization (NGO) and research institution. UEM is the main public university in Mozambique.

The study was conducted in Marracuene and Manhica districts in Maputo Province. This region has around 334,000 inhabitants and 21 rural health centers. This study site was involved in previous ICRH-M studies, and therefore health providers and health managers working in this area have a constructive relationship with the principal investigator and ICRH-M researchers.

Research team

The principal investigator (AG) is a Belgian doctoral student with research experience in Mozambique. She was assisted during all focus group discussions (FGDs) and couple interviews by a research assistant (HC) and two fieldworkers. The research assistant was a final year medical student doing an internship at the reproductive health research unit of the Universidade Eduardo Mondlane. Key informant interviews (KIIs) and observations were conducted by the researcher alone prior to the FGDs.

Participants & study procedures

Data collection took place between March and October 2017. Firstly 10 key informant interviews were carried out over a 2 month period, followed by 11 days of semi-structured observations as preparation before the FGDs. Afterwards 16 FGDs were conducted with providers and community members to explore different aspects of male involvement, which were explored further in three in depth couple interviews. FGDs were spread over a period of 5 month period to allow for minimal interim analysis, followed by the in depth interviews.

The key informant interviews were conducted with maternal health policymakers, researchers and NGO staff. Men and women specialized in maternal health policies, program implementation and research in Mozambique were eligible for participating in the interviews, which aimed to frame the topic within the political and structural context of Mozambique. Experts working in private clinics or commercial organizations were excluded. Participants were identified using a 'snowballing' approach. The first round of contacts was identified by personal contacts of the authors (AG, OD, SG, NO and KR) and reviewing attendee lists of national maternal and child health conferences. In addition interviewed contacts were asked to nominate other appropriate key informants. Key informant interviews all took place face-to-face in a private room. All interviews were recorded and transcribed, except for one interview where only notes were taken (no recording was allowed by the participant).

Subsequently, AG conducted sit-in observations at antenatal clinics and attended health promotion sessions at the different study sites to explore the workload of providers, number of men attending ANCs, power dynamics within the consultation and quality of care provided. Seven different study sites were purposively selected to include health centers with different characteristics (high versus low workload, urban versus rural). Both a checklist (see Additional file 1) and written narratives were used to collect the data of the observations. In total 159 antenatal consultations were observed.

Afterwards, FGDs were conducted with providers and community members. For the FGDs with providers, the heads of the health centers were contacted to discuss a date and time for conducting the FGDs. All health care centers in Manhica and Marracuene were listed and the study sites were purposively selected to include health centers with different characteristics and good road access. FGDs were planned during lunch break or after working hours. Men and women were mixed in the focus group discussions with providers, as we believed in this group the gender dynamics are of interest and would not affect the openness of the participants. For the FGDs in the community, community leaders were contacted in advance with an invitation letter. Communities with different characteristics were selected (distance to a health facility, rural versus urban, seasonal wave of work or year-round employment, …) for the study. All respondents for the FGDs in the community were purposively selected to represent certain segments of the population—namely, pregnant women or pregnant < 2 years ago, male partners, community leaders, health activists, CHWs, and traditional birth attendants. FGDs in the community were divided into male and female groups, since we believed this composition may make participants more likely to discuss topics openly together than if groups were mixed. FGDs were conducted in a private place, inside the community office or under a tree away from other activities, and the date and time were decided by the community leaders. For both provider and community FGDs, the number of participants per group ranged from 5 to 8. FGDs in the community were conducted in the local language (Changana), while provider FGDs were conducted in Portuguese. All FGDs were facilitated by the researcher, assisted by two local fieldworkers. The researcher is fluent in Portuguese and the fieldworkers were fluent in both Portuguese and the local language. FGDs in the community with men were assisted by a male fieldworker and FGDs in the community with women by a female fieldworker. FGDs were spread over a period of 5 months to allow for minimal interim analysis. Data was collected until data saturation. The interview guides

for the key informant interviews and FGDs can be found as additional files (see Additional file 2).

Subsequently, themes that emerged during the community FGDs were discussed with three couples, the couples were purposively selected in order to include couples at different stages of their reproductive life. As FGDs within the community were conducted with men and women separately, we wanted to conduct these interviews with men and women together to generate new insights regarding the dynamics within couples. In depth couple interviews were conducted in the local language (Changana).

Data analysis

All interviews and focus group discussions were transcribed verbatim in Portuguese, except for the FGDs conducted in the local language, which were translated into Portuguese during transcription. Transcription from the local language into Portuguese was conducted by the research assistant (mother tongue Changana) and an extra interpreter as a double check. Thematic analysis was used as data analysis method and the framework approach was used as a tool, including 7 stages of analysis: transcription, familiarization, coding, developing a working analytical framework, applying the analytical framework, charting data into the framework matrix, interpreting the data [22]. R Qualitative Data Analysis (RQDA) software was used for coding. All data was coded by both AG and HC, afterwards all codes were discussed, and they agreed on a set of codes and categories (first four steps of the framework analysis). After reviewing a number of theories on access to healthcare and health promotion programming [23–27] the socio-ecological framework was identified as the most appropriate model to guide the analysis. Four units of analysis were identified: individual, interpersonal, community and health system related factors (see Fig. 1). The last three steps of the framework approach were supervised by OD. Field notes from observations were also analyzed and added as analytical memos that facilitated interpretation of certain phenomena that emerged during data analysis. All analysis was carried out in Portuguese and some quotations were translated into English by the researcher in the present article. Only age ranges were reported along with quotations to guarantee anonymity. Translations of quotations were double checked by a bilingual colleague (mother tongue Portuguese).

Ethical considerations

For the observations all health directors and health providers of the participating health centers were asked for permission after explaining the aim and procedures of the study. The women and their partners (if present) were asked orally if they consented to be observed during consultation before entering the consultation room.

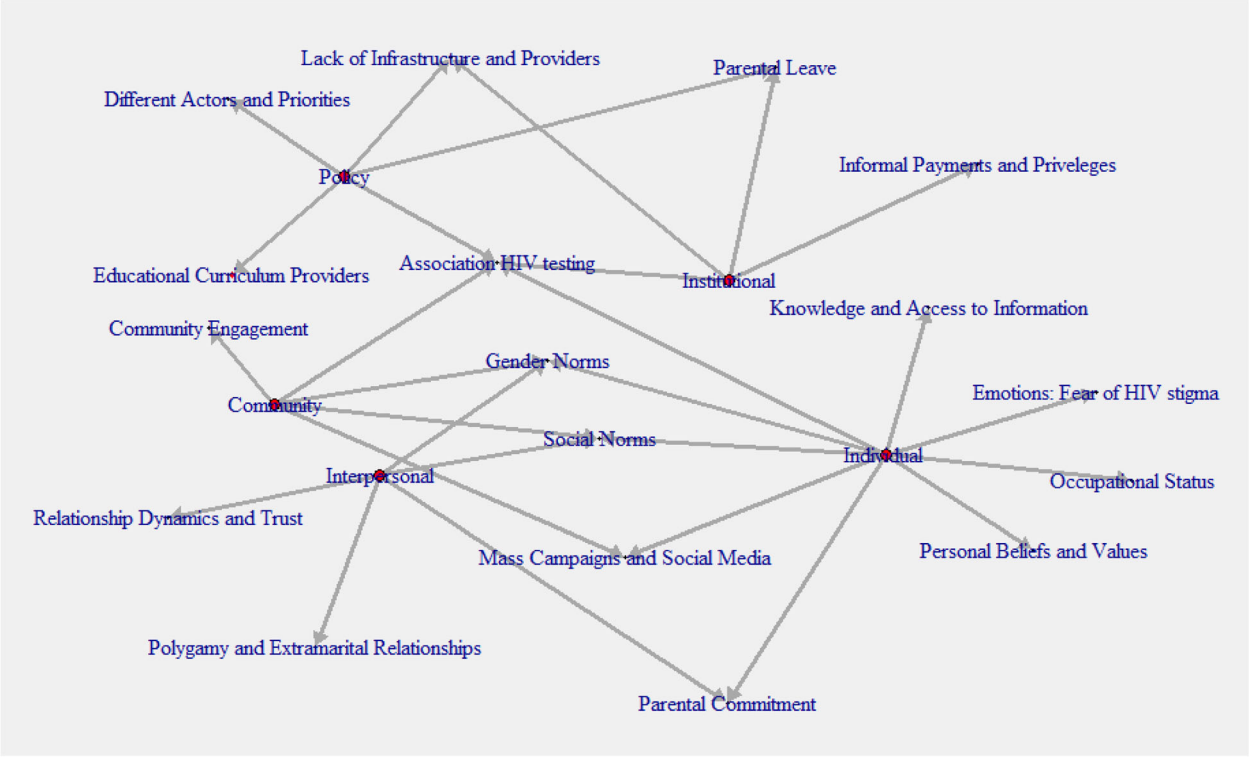

Fig. 1 Socio-ecological framework with emerging themes in RQDA-plot

The provider explained to them the observer was a Belgian midwife, conducting a study about the Mozambican health system.

For the FGDs with providers the district officers were contacted for authorization and organizing the FGDs. FGDs in the community were organized by the community leaders. Information about the objective of the study and procedures was provided to all respondents (KIIs, FGDs and in-depth interviews) orally and in writing. Participants were asked if they consented to interviews being recorded using a tape recorder. Confidentiality, anonymity and ground rules were discussed before starting an interview or FGD. Participation in the study was voluntary and all participants of the key informant interviews, FGDs and in-depth interviews gave their written consent. Participants not capable of signing could provide their fingerprint. No incentive was provided, other than refreshments during FGDs. Ethical approval for the study was obtained by the medical ethical commission of Ghent University (EC/2018/1319), the National Health Bioethics Committee of Mozambique and the Health Bioethics Committee of UEM and HCM (Maputo Central Hospital) (CIBS UEM&HCM/0008–17).

Results

Semi-structured observations

The partner was present in 4.4% ($n = 7$) of the observed consultations. 23.3% ($n = 37$) consultations were first ANC consultations, during which approximately one third of women (36.1%; $n = 11$) received an invitation card for the partner. Of the women coming for a follow up ANC visit, 9.4% received an invitation card.

All women that came for their first ANC ($n = 37$) were tested for HIV, six of these women were HIV positive, and of these, five women received the invitation card for their partner.

Key informant interviews

Ten key informant interviews were conducted with maternal health experts from different fields (see Table 1). Age of the respondents varied between 42 and 54 years old.

FGDs

In total 38 providers participated in 6 focus group discussions organized at 6 different health facilities (Table 1).

At the community, 10 FGDs took place in four different communities, with a total of 63 participants. Average age of the community participants was 38 years old and the average number of children 4. 64% of the respondents was female (Table 1).

Table 1 Participants' characteristics

	Male	Female
Key informant interviews (n = 10)		
Key informants background		
· Government (MoH)	0	3
· NGO	2	2
· Academic background	1	2
Community FGDs (n = 10, total 63 participants)		
Position in community		
· Activist/CHW	1	6
· Child <2 years old	6	15
· Pregnancy	4	7
· Community Leader	11	6
· Traditional Midwife	0	5
· Traditional Healer	1	1
Level of education		
· None	1	8
· Primary	20	27
· Secondary	2	2
· Higher education	0	1
Marital status		
· Single	3	14
· In relationship	20	21
· Widow	0	4
Providers FGDS (n = 6, total 36 participants)		
Function in health center		
· MCH nurse	0	13
· General nurse	2	1
· Technical Pharmacist	0	3
· Technical Agent	2	9
· General Doctor	0	1
· No qualification	1	1
· Social worker	1	5
Marital status		
· Single	4	18
· In relationship	1	15
Couple interviews (n = 3, total 6 participants)		
Reproductive life stage		
· Pregnant couple expecting first child	1	1
· Young couple with 6 children	1	1
· Senior couple with grandchildren	1	1

In-depth interviews with couples

Three in-depth couple interviews were carried out. The first couple was a young unmarried couple expecting their first child. The second couple was a community

leader with his second wife and five young children and the last couple was a senior religious leader with his wife.

Individual-level barriers/facilitators

Personal beliefs and values

At the individual level it was clear that men are interested and feel responsible for their partner and unborn baby but that they express their involvement in ways other than going with their wife to ANC. Some men did see it as their task to accompany their wife inside the consultation, but these cases were rather exceptional. In general the younger generation was especially interested in what happens during the ANC consultation.

> *"I went with my wife to the antenatal consultations but I had to wait outside, although I would have liked to know what happens inside. I also want to accompany her for delivery but it's not allowed." Expectant father, age group 30–40, couple interview.*

Most men assist with logistics, money and accompaniment to the health facility gate. Health care issues and especially pregnancy and childbirth are considered a female domain by the majority of men. When someone in the family (such as wife, baby or other relative) is seriously ill the man will assist by accompanying them to the hospital and will take part in decisions, but for regular visits it is considered a waste of their time. The few men that considered male attendance at ANC to be important explained that, for them, this support is a part of taking care of your family and loving your wife.

> *"I think it's important men are involved and go with the wife to ANC because … it's an act of showing love." Male religious leader, age group 50–60, community FGD.*

Knowledge and access to information

Most men in the community have limited knowledge about ANC or maternal health. In the male FGDs much more framing and explanation was needed about the aim of the discussion, because the participants often did not really know what an antenatal care consultation is, considering all consultations to be the same. This lack of knowledge may mean that men also have limited knowledge about pregnancy and may be resistant to any health behavior or recommendation during pregnancy (such as male involvement, or the importance of good nutrition or a bed net).

Emotions: fear of HIV stigma

Male FGD participants stated they have to accept an HIV test when they go to the clinic, and that most men are scared of the result and associated stigma. HIV is often seen as a women's disease, so a lot of men believe that women should deal with it. Female respondents explained women are often blamed for an HIV infection. When the woman gives her partner the invitation card from the health center, this can create conflict because it is associated with HIV positive couples and bad news. Women are reluctant to invite their partner because they are afraid of being abandoned if they test positive during the consultation. A lot of women do not reveal their status and take anti-retroviral medicine (ARVs) without their partner being aware because of the emotions and conflict this might create between the couple.

> *"The good thing is, when a pregnant woman tests positive, she might not tell her husband but at least she will take the ARVs. She will just do it in secret. That's why they never want to bring their husband, they are afraid he will discover and abandon them once they know she is HIV positive." Female Provider, age group 20–30, Provider FGD.*

Providers also explained that a lot of men do not want to be involved in the treatment of "women diseases" such as those associated with HIV, pregnancy and childbirth. However, they also mentioned that men can become more engaged in these issues when the importance of treatment or care for the unborn child is emphasized.

> *"Men are more interested in the health of the baby than the health of the woman. The wife they can change anytime but the baby will be theirs forever." Female Activist, age group 30–40, Community FGD.*

Occupational status

A lack of time was one of the reasons most cited by men for not attending ANC with their wives, compounded by the risk that a man may lose a day of income when he chooses to accompany his wife. However, when this theme was discussed in the in-depth interviews men revealed that this may be more of an excuse than a real barrier. They explain that they see it as a matter of priorities, since most men have spare time to spend on activities outside work, and since most employers accept a temporary absence from work for this occasion. Their perception is that the main barrier is that men consider their attendance at ANC as "a waste of time" rather than the fact that they cannot leave work.

"To be honest, it's not a matter of time. You will see men outside drinking with their friends. Those are the same men that say that they don't have time." Father, age group 30–40, couple interview.

Interpersonal barriers/facilitators

Relationship dynamics and trust

Both men and women in the community explain that expecting a child can change the relationship dynamics within a couple. During pregnancy negative feelings of uncertainty, neglect and distrust are more common. Intimate partner violence as a consequence of the stress related to pregnancy was mentioned by both men and women. For some men the stress around pregnancy is a trigger to abandon their wife, initiate extramarital relationships or start beating their wife. Domestic violence when there are frustrations is still common, but according to older community members it is less frequent in the younger generation. There was a general consensus among community participants that intimate partner violence is unacceptable and that taking care of the wife should be the norm.

These changing dynamics and distrust in each other during pregnancy might explain why many men and women mention that lack of trust is one of the main motivators for men to be involved during pregnancy. Men think their pregnant wife might not actually go to ANC or might lie about recommendations of the provider. Additionally, providers often say that men should accompany their partners in order to receive the information "first hand". Consequently, a lot of men believe there is no need to accompany their pregnant partner to ANC if they can trust her, in which case they assume she will give them any important information after the consultation.

"*If you don't trust your wife it's better to go with her. If you trust her, you can let her go alone". Male community leader, age group 50–60, Community FGD.*

Therefore male involvement motivated by distrust is not always considered as positive for women.

"*For those women who have a good, open and honest relationship with their husband it's fine to bring their husband. For those who are married to the … euhm the typical macho man, it's difficult, they are not open, there is no trust. They are scared to invite their husband, to bring their husband … They are scared to be accused of HIV infection." Female provider, age group 30–40, Provider FGD.*

Furthermore, when couples go together to ANC, very often the man takes the lead in terms of the discussion and decisions. A provider explained:

"Women can take the initiative, but the man has the last word." Female provider, age group 30–40, Provider FGD.

Many providers stress the importance of male involvement and male attendance at ANC during pregnancy for the relationship with the mother (psychosocial support) and the benefits for the unborn child. They explain that participating male partners have a better relationship with their child in the future compared to partners that are absent during pregnancy. Also women explained that they want their husbands to be present because it reduces their stress. Men do want to support their partners but in general that think it is more important to support her with practical arrangements such as good food, money and housing than with psychosocial support.

In relation to money, the providers and community members explain that women receive a small part of the men's salary for household tasks and food. Most women are allowed to go to ANC by their partner and can use some of the household money for transport. For health related decisions that represent a considerable cost (for example transfer to a referral hospital) she needs authorization of her husband, or in his absence someone from his family will take the decision.

Polygamy & extramarital relationships

In situations of polygamy the relationship can become complex. When a man has more than one wife it becomes hard to be involved in each pregnancy, for example by going to ANC with each spouse. Both providers and women explain that polygamy often causes problems because the man cannot take care of the different wives at the same time.

"Mostly when the man is not very involved or is absent it's because he has another wife somewhere. If he takes a second wife he should take care of them equally. But this is not easy. If one receives meat, the other one will complain if she is not receiving the same." Male community leader, age group 50–60, Community FGD.

Parental commitment

An important factor that will influence a man's decision to be involved is accepting responsibility for the pregnancy. Especially when it is the first pregnancy he might try to "escape" from his responsibility and claim the unborn baby is not his child. Whereas when the pregnancy

is planned men are usually proud of their unborn child and will more willingly engage, this is less common when the pregnancy is unplanned, when there is a high risk the man will not accept the pregnancy. Community, members describe this as something that happens more often than before, since more relationships are informal (not officially married/living together) which makes it easier for men to disown the pregnancy.

"When we were young, sex before marriage didn't exist. The problem is that now youngsters start with sex even before knowing each other. When the girl gets pregnant the guy just runs away." Male community leader, age group 50–60, Community FGD.

Before, parents were more involved and the parents of the pregnant girl would negotiate with the man's parents to accept the pregnancy and to marry the girl. Nowadays the leadership role of the parents and elders is less strong in the communities. It is common for women to be abandoned by their boyfriend once the pregnancy is discovered, although sometimes a man who has left his partner during pregnancy comes back when the child is born. This is mostly a couple of months after delivery, when the most difficult and risky period has passed and when the father can interact and play with the child. Providers explained that male involvement is more common in pediatric consultations because of these reasons.

"A husband will seldom show interest in his wife when the baby is still in the "cervix", when the baby is out of the cervix, yes he will come." Female community health worker, age group 30–40, Community FGD.

Community barriers/facilitators

Gender norms

Strong gender norms persist in the community. Men, women and providers expressed the opinion that a man should not waste his time queuing and that men get priority at the health facility to receive care. They justify this rule by explaining that men often have work responsibilities. The man takes the lead in daily life (e.g. opening the door for visitors, negotiating prices and constructing a house for the family) and this dominant role is also evident when the man goes with his wife to ANC. If a man is present in the ANC consultation room, the consultation will be directed towards the man, who having received information there will then take care of his wife by giving her the medication or supervising her behavior. This is not perceived as incorrect or discriminatory by either women or providers.

Providers, men and the majority of women consider the priority rule for men as a positive initiative. Only one male community leader and one traditional midwife were critical of this priority rule and the associated gender inequality between men and women.

"In the bible it's written that we are all equal, man and woman. But a lot of men don't consider women as equal. A woman can have five children and will take care of all of them. You will hardly find a man who will take his responsibility and take care of his children. Even if he has just one child, he will leave the kid with a sister or his mother and leave. He might only return the next day, after going out drinking. A woman on the other hand will combine everything. She will study, work and take care of all her children." Traditional midwife, age group 40–50, Community FGD.

Social norms

Supportive men are considered as "good" men in the community but this support should not be expressed by doing "female tasks". Most men are afraid of the reaction in the community when they accompany their wives to ANC or help in domestic work. They explained that embarrassment is one of the most pertinent barriers to their engagement in maternal health issues. A supportive husband works outside of the home and takes care of his family, but does not necessarily go with his wife to ANC. The majority of community respondents did not like this strong distinction in male and female roles but at the same time felt pressure from the community to respond to these traditional masculinities. Men are afraid that people will laugh at them or think their wife "bewitched" them when they accompany her to ANC.

"If you see a man going with his wife most people think he has HIV or has another serious disease. Or he is not good in his mind." Young father, age group 20–30, Community FGD.

Some older men also believe it is not appropriate to enter inside the ANC room.

"Yes we will bring her to make sure she goes to the consultation. But going inside, no, that's not for us." Male religious leader, age group 50–60, Community FGD.

On the other hand, providers were of the opinion that everyone in the community knows that men's involvement in pregnancy is important and that these social norms are no longer a major barrier. They make the comparison with homebirths, in that nowadays almost everyone accepts that it is better to deliver in the facility.

They believe that social norms are constantly changing, influenced by what is advised at the health facility and during community health promotion talks.

Community engagement

Many providers stress that more effort and initiative has to come from the community. They suggest that by having some "champions" or "good examples", others can adopt these practices. Both the community and providers recommend investing more in health talks in the community and organizing these for a mixed audience of both men and women.

> *"At the health care center we do enough. We give health talks, give invitations for men and they don't have to wait in the queue. Now the effort has to come from the communities." Female Provider, age group 20–30, Provider FGD.*

Another practical recommendation that was made is to address male attendance at ANC during local community meetings because these are mostly attended and organized by men (community leaders).

> *"We have monthly community meetings. You only see men there. That's where they should talk about male involvement." Male community leader, age group 40–50, Community FGD.*

Providers also stress that the focus should be on male involvement in all health issues (including general consultations, pediatric care, and antiretroviral therapy) and not only on one issue because this can lead to misunderstanding (such as associating male attendance at ANC with HIV status).

Mass campaigns & social media

A lot of men reported being informed about the importance of health care issues through radio, television and community mobilization programs. However, these initiatives often focus on spreading general health information and do not focus on the active role fathers can play during pregnancy and childbirth.

Providers reported seeing increased interest by a small number of men and believe this is because of public service announcements on television and wider access to the internet, as opposed to the efforts at the health center. Young men see role models involved in family life on television and by WhatsApp internet/messages, which stimulates this behavior change.

> *"But there is already more access to information and that helps. Men take better care of their wife than before. For example, on television, before and after the news you have publicity where you see men involved in the family. "Male provider, age group 30–40, Provider FGD.*

Institutional

Lack of adequate infrastructure & competent providers

At all levels there is consensus that the health system is not set up to receive men. Important health checks such as blood pressure screening and weight control are often skipped because they are time consuming and appropriate material is unavailable. There is a lack of privacy during ANC because of the poor infrastructure and high work pressure, which is felt to be less of an issue with women-only consultations. Frequently two consultation are done simultaneously in the same room, and even for intimate exams or HIV testing privacy cannot be guaranteed. If more men are present at ANC this will become even more complicated.

Community members explained that it depends on the provider whether or not a man can enter the ANC room. Providers claim they always invite the man inside but during the observations it was evident that some providers indeed prefer to see the woman alone in order to gain time. Only after the consultation they will invite the husband inside for an HIV test.

Both men and women in the community have a high trust in the competence of the provider and their advice or expertise will almost never be criticized or questioned. Providers explained that the majority of men think that if they bring their wife to the hospital they are "saved" and that they have done their job.

> *"Men don't prepare anything before the delivery because of myths. It brings bad luck to prepare something before the baby is born. But men also think if they drop the wife at the hospital for delivery everything is fixed. Health care providers are almost "God"." Female provider, age group 20–30, Provider FGD.*

For delivery both providers and community participants stated that the man can bring his wife to the health center but will be sent away to wait at home for news. None of the respondents mentioned that men had ever been allowed to accompany their wife for the delivery. Several men and women in the community would be in favor of permitting the husband as a companion during labor and/or delivery. Currently only female companions are allowed.

Informal payments and privileges

Both men and women in the community explain that payment of informal fees is very common and this was confirmed during the observations. Community leaders

explained that informal fees are almost standard for care during delivery, and are hidden in the woman's sarong (*capulana*). They explained that extra payments are often made for receiving medication, better treatment and allowing a companion during delivery. During ANC, informal fees are less common but can also happen, mostly in order to obtain better/faster treatment or medication. Women need to ask for money from their husbands to pay for these privileges and as this practice is widely known, men will support their wife with extra money if they can afford it.

> *"You know, here you have to pay for everything. That is the biggest problem in Mozambique. For delivery you will have to pay if you want your wife to be treated well and have a birth companion. You pay or she might deliver alone." Male community leader, age group 40–50, Community FGD.*

Association with HIV testing

Although it is not official policy, all providers explain that everyone is obliged to get tested for HIV at the health center. Male accompaniment during ANC is highly associated with HIV testing. In the community it is common knowledge that if you go to ANC you will have to accept an HIV test. This idea stems from previous Prevention of Mother to Child Transmission of HIV (PMTCT) campaigns where men were encouraged to go to the health center for HIV testing.

> *"Here everyone gets tested, it' obligatory. Officially maybe it's not obligatory but in this health center nobody leaves the antenatal consultation without testing." Female provider, age group 30–40, Provider FGD.*

Policy level

Different actors & priorities

At policy level all experts explained that there is no clear written strategy at national level regarding male involvement in maternal health. Currently two interventions are being implemented in ANC: the distribution of invitation cards for men and the priority rule for couples. Interviewees stated that these strategies are not specified in any official document. However, all providers and the majority of community participants were familiar with these two practices.

> *"I don't have the strategy on paper here. But we want the men to be involved. We have some already present during antenatal consultations and we would like them to be there for the delivery as well. We try to get the men to antenatal consultations by giving priority to couples." Government officer, age group 40–50, key informant interviews.*

Most donors interviewed do not consider male involvement as a priority. The larger NGOs often focus on HIV and invest in mass campaigns with measurable outcomes. Experts explained that male involvement is not a topic that attracts donors, especially when there are so many other health problems on the national agenda such as HIV, malnutrition, malaria and intimate partner violence. The low interest at policy level is often explained by the fact that overall quality of care is low and the health care system already overwhelmed, so that there is limited appetite for initiatives that invite even more "clients" to health facilities.

> *Personally I don't think it's a priority and there are many other problems in this country... I would rather do a mass HIV screening campaign for men at the border with South Africa than inviting them in the regular health system." NGO officer, age group 50–60, key informant interviews.*

Parental leave

Currently there are no clear policies regarding ANC attendance for men during working hours. Health centers are only open during working hours, which is perceived as a barrier for men. Some health centers do provide a medical certificate that the man can present to his employer, but others do not. Both community participants and providers were of the opinion that official parental leave for going with your wife with ANC would facilitate male involvement during pregnancy.

Educational curriculum

Experts familiar with the training curriculum for Maternal and Child Health (MCH) nurses explained it is very focused on women and children, with no specific attention paid to the role of men or their specific health needs. Very often the MCH nurse is also in charge of general consultations and in many cases is the only person with a medical training in the health center. General health problems are addressed during their training but specific problems related to men's health, such as inguinal hernia and prostate problems, receive very little attention. Moreover providers lack supportive supervision during their career once they complete their studies, limiting opportunities for continuous learning and skills improvement.

Discussion

Our findings suggest the existence of strong social norms in southern Mozambique regarding the responsibility of

men to take care of their wife and family within the community: while this is seen as very much part of men's roles, there are also aspects that are seen as the women's domain, particularly those relating to pregnancy and childbirth and including attending ANC (see Fig. 2). However younger men wanted to break with these traditions. Until now attending ANC with the wife during pregnancy is often not considered as "taking care of the family". Studies in Kenya, Ghana and Uganda found similar results: traditionally men are supposed to take care of the family but very often pregnancy and childbirth is considered as the women's domain [28–30]. In our study a generational evolution was noted regarding men's interest in maternal health care issues. Younger men were generally more motivated to take an active role during pregnancy and even be present during antenatal consultations and delivery. However, barriers at the health facility and strong social norms within the community often deterred these young men from putting their intentions into practice. Interventions aimed at increasing male involvement should incorporate and build on these existing roles of men as caretakers of the family and could use this message to persuade men to attend ANC together with the wife.

Echoing the results of another study in central Mozambique [5], male attendance at ANC was associated with being weak and/or HIV positive in our study. This might be related to the fact that most male involvement programs in Mozambique and beyond have so far focused narrowly on men's involvement in PMTCT and have generally not tackled male involvement in a broader sense [31, 32]. Male involvement is often limited to testing the male partner in addition to PMTCT [33]. This tendency has led to high stigmatization of men going with their wife to ANC. Policymakers, researchers and program managers working on HIV should be aware of this problem and focus more on promoting male involvement during pregnancy as an important aspect of taking care of their partner and unborn baby, rather than specifically as a strategy for strengthening HIV prevention and care.

At health facility level we observed several situations where the presence of the husband during ANC can have a negative impact on the empowerment of the woman. Due to persisting socio-cultural beliefs related to gender, when a man attends ANC, both the provider (because of their profession) and husband (because of gender inequality) will take a superior role, which places the woman in a submissive position. These power dynamics will affect the consultation in a negative way, in that sense that the woman will be less able to express her doubts, questions, needs or concerns. These dynamics were also described during the FGDs by providers and community members. To address this problem, providers could be trained to promote gender equity within the consultation. Research has shown that gender sensitive programs are more effective in changing health related behavior than narrowly focused interventions [14, 24, 34].

Our study demonstrates that some initiatives have been taken by the Mozambican government to involve men in ANC such as priority attendance for couples and distribution of partner invitation cards during ANC. However, they have apparently had minimal success in the study area, as most women continue to frequent ANC alone and most men do not consider it important to attend ANC with their pregnant partner. This way of program planning is also seen in other countries: male involvement interventions commonly adopt a reductionist and instrumentalist approach that is focused on altering men's behaviours, without addressing underlying gender roles that drive these behaviours [14].

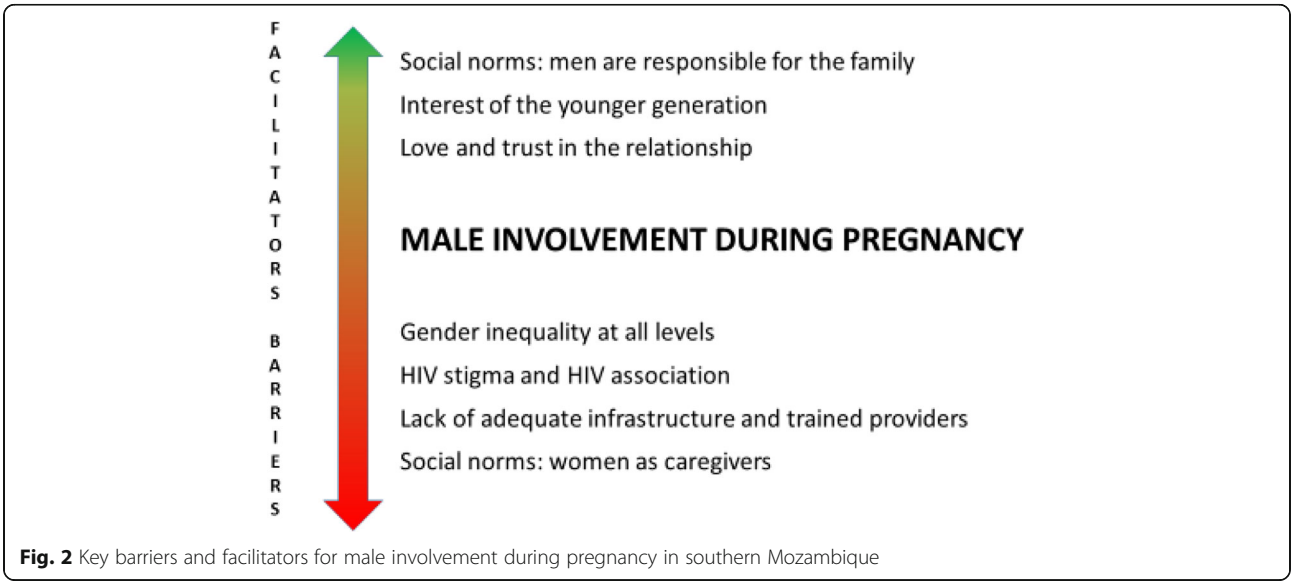

Fig. 2 Key barriers and facilitators for male involvement during pregnancy in southern Mozambique

Instead of the priority rule for couples we would recommend governments invest more in high quality antenatal care consultations that are adapted to also receive couples. The current priority rule can be seen as a quick fix that is unfortunately also reinforcing gender inequality. In order to reduce waiting times for both women and couples at ANC, an appointment booking system (currently being piloted in Mozambique) could be considered [35, 36]. Another challenge when inviting male partners to ANC is offering privacy during the consultation, which is less of an issue with women only. However, investments in health infrastructure are hard to obtain in low resource settings where many other health priorities require attention.

Another important building block for high quality couple consultations will be the educational curriculum of providers working in primary care. Before inviting men to ANC, providers should be trained to deal with couples in an equal way and address the needs of both partners. Until now health centers have been very female oriented with a strong focus on maternal health, which could be shifted to more family-oriented care.

Sensitization of men is mainly done in the health facility or by passing health messages to men through their partners. Our findings also suggest that very little is done at community level and initiatives are concentrated at health facility level. We believe it would be more effective to target men directly in the places where they gather, for example in community meetings, churches, workplaces or other meeting points. By organizing health promotion talks and awareness raising events at community level for both men and women, maternal health could be understood as a shared responsibility and not that of women alone. Additionally, schools are important places to address underlying gender dynamics in the household and promote gender equality from an early age.

Limitations

There are a number of methodological constraints that limit the interpretation and generalizability of this study. Participants were recruited by community leaders and participation was voluntary. This resulted in participants with a relatively high socio-economic status (illustrated for example by the fact that most of them had access to television) and an interest in the topic. Families with low access to health services were probably poorly represented. Also, specific cultural norms and socio-economic dynamics characterizing southern Mozambique may limit the extent to which the results from this study are generalizable to other regions. Another limitation is the different languages (Changana, Portuguese and English) used throughout the process from study participant to reader. Although all translations were double checked by bilingual members of the research team, translation is an interpretive act and some meaning may have been lost [37].

Conclusion

Our study showed there is not a coherent strategy in Mozambique to promote male involvement during pregnancy. A significant structural problem is the lack of adequate health infrastructure and trained providers to deal with both the pregnant woman and her male partner during ANC. In the community strong positive social norms exist regarding the responsibility of men to take care of their wife and family. However, the association of men attending ANC with being HIV positive and strong gender roles keep them away from active involvement during the antenatal period. Social norms regarding parenting as a shared responsibility that starts before birth should be incorporated in male involvement strategies in maternal health instead of the current focus on HIV prevention and care. Gender-equitable relationships between men and women should be encouraged in all maternal health interventions and providers should be trained to deal with couples in ANC in an equal way.

Supplementary information

Supplementary information accompanies this paper at https://doi.org/10.1186/s12884-019-2530-1.

Additional file 1: Checklist observations.

Additional file 2: Interview Guides.

Abbreviations

ANC: Antenatal care; ARV: Anti-retroviral medicine; CHW: Community health worker; FGD: Focus group discussion; HIV: Human immunodeficiency virus; KII: Key informant interviews; MCH: Maternal and child health; NGO: Non-governmental organisation; PMTCT: Prevention of Mother to Child Transmission of HIV; RQDA: R Qualitative Data Analysis; UEM: Universidade Eduardo Mondlane; WHO: The World Health Organization

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Authors' contributions

AG developed the study protocol, collected data and drafted the manuscript. HC assisted in data collection and analysis. OD, KR, SG and NO assisted in data analysis and interpretation of the results. All authors revised the manuscript critically and read and approved the final manuscript.

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Availability of data and materials
The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Ethics approval and consent to participate
Ethical approval for the study was obtained by both the National Health Bioethics Committee of Mozambique and Bioethics Committee of Ghent University. All participants gave their written consent.

Consent for publication
Not applicable.

Competing interests
The authors declare that they have no competing interests.

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Publisher's Note

4.2 What are current practices of men and level of knowledge of danger signs during pregnancy and childbirth in the community in Mozambique

A cross-sectional study of the role of men and the knowledge of danger signs during pregnancy in southern Mozambique

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SUMMARY

What is already known?

-Male presence at ANC is estimated to be very low in Mozambique, but national numbers or estimates are not available.

-High quality antenatal care is a challenge in Mozambique and often not all components of care are provided in rural health facilities.

What are the new findings?

-Maternal health care cannot solely be considered as "a women's business" , in majority of the cases men are involved in the decisions about antenatal care attendance and providing financial support.

-Maternal health care knowledge was equally low among men and women and male presence during ANC (at least once in the last pregnancy) was reported to be 30% .

-Communication with the partner was associated with higher maternal health knowledge among men and women, while presence at ANC was not.

What are the implications of the new findings?

-The quality of ANC should be improved for optimising maternal health care provision, whereby counselling of men and women regarding birth preparedness and knowledge of danger signs takes a central place.

-Improving and facilitating communication between men and women about maternal health care issues might be an important intervention strategy to improve male involvement and maternal health outcomes.

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RESEARCH ARTICLE Open Access

A cross-sectional study of the role of men and the knowledge of danger signs during pregnancy in southern Mozambique

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Abstract

Background: The role of the male partner and wider family in maternal health, especially in case of emergencies, has been receiving increasing attention over the last decade. Qualitative research has highlighted that women depend on others to access high quality maternity care. Currently little is known about these factors in relation to maternal health in Mozambique.

Methods: A cross sectional household survey was conducted with men and women in southern Mozambique about decision making, financial support and knowledge of danger signs. A multivariable logistic model was used to identify factors associated with knowledge of danger signs and Cohen's kappa for agreement among couples.

Results: A total of 775 men and women from Marracuene and Manhica districts were interviewed. Maternal health care decisions were frequently made jointly by the couple (32–49%) and financial support was mainly provided by the man (46–80%). Parental and parent-in-law involvement in decision making and financial support was minimal (0–3%). The average number of danger signs respondents knew was 2.05 and no significant difference ($p = 0.294$) was found between men and women. Communication with the partner was a significant predictor for higher knowledge of danger signs for both men ($p = 0.01$) and women ($p = 0.03$). There was very low agreement within couples regarding decision making ($p = 0.04$), financial support ($p = 0.01$) and presence at antenatal care consultations ($p = 0.001$). Results suggest women and men have a high willingness for more male participation in antenatal care, although their understanding of what constitutes this participation is not clear.

Conclusion: The study findings highlight the important role men play in decision making and financial support for maternal health care issues. Strengthening male involvement in antenatal care services, by investing in counselling and receiving couples, could help accelerate gains in maternal health in Mozambique. Maternal health care studies should collect more data from men directly as men and women often report different views and behavior regarding maternal health care issues and male involvement.

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Background

Maternal mortality remains unacceptably high in most low- and middle-income countries. As a consequence, improving maternal health is still a high priority under the Sustainable Development Goals (SDGs). The SDGs agenda places greater emphasis than the Millennium Development Goals (MDGs) on cross-sectoral links across social, economic and environmental pillars [1]. Furthermore, the SDGs aim to reduce inequalities within and between countries as key mechanism to improve health for all. The global target for maternal health under the SDGs states that by 2030, the global Maternal Mortality Ratio (MMR) should be reduced to fewer than 70 maternal deaths per 100,000 live births, and that at national level no country should have a MMR greater than 140 maternal deaths per 100,000 live births [1].

In Mozambique, one of the poorest countries of Sub-Saharan Africa, the latest estimated MMR is still very high at 289 per 1,000,000 live births in 2017, with wide variations across the country [2]. As part of efforts to reduce MMR, Mozambique adopted the World Health Organization's (WHO) focused antenatal care (FANC) program consisting of four visits for low-risk pregnancies without complications [3]. This antenatal care (ANC) program includes health promotion and the prevention, detection and treatment of diseases during pregnancy. During the MDGs era, the global coverage of ANC contacts improved in almost all low and middle income countries (LMICs), but the content and quality of antenatal care has been questioned [4, 5]. Several studies have shown that some practices from the FANC model, such as counselling on danger signs and hypertensive disease management, are often neglected by providers in LMICs [6–8]. A recent study in ten LMICs found that coverage of provision of information on complications during pregnancy was extremely low [9], despite the fact that communicating such information requires no supplies or equipment. Informing women and their partners about danger signs during pregnancy is an essential step for appropriate and timely referral of pregnant women in case of life threatening emergencies. Furthermore counselling on danger signs is also identified as a critical component of ANC by women themselves [10], motivating them to seek ANC. Investing in information, education and communication programs during pregnancy can prevent maternal mortality caused by the first delay of the three delays model of maternal mortality, which proposes that maternal mortality is associated with delays in: 1) deciding to seek care; 2) reaching the healthcare facility; and 3) receiving care [11].

WHO updated its ANC guidelines in 2018 [12] and now recommends that each woman attends eight or more routine ANC consultations during pregnancy, rather than the four visits suggested by the previous model. The new guidelines are more comprehensive than the previous model, with an increased focus on the experience of care. According to WHO, experience of quality care requires effective communication with the woman and her family, provision of care with respect and dignity, and access to social and emotional support. However, considering many countries already struggle to ensure adherence to the recommendations contained in the previous model [13], it will be even more challenging for countries with limited resources to adhere to these more comprehensive recommendations. The Ministry of Health (MOH) in Mozambique has not yet adopted the new ANC model but has begun to address quality of ANC, for example through the implementation and evaluation of a supply kit for ANC and scaling up the training of Mother and Child Health (MCH) nurses [14].

In Maputo Province (the most southerly province in Mozambique), 74% of all pregnant women complete the WHO-recommended four or more antenatal visits and 87.5% deliver in a health facility [15]. At community level persisting barriers continue to prevent timely care-seeking behavior for obstetric emergencies and delivery. A qualitative study, conducted in 2016 in southern Mozambique, revealed that unfamiliarity with danger signs, especially among partners, was a major reason for not seeking care [16]. Male partners, neighbors and mothers-in-law are key actors in the referral of pregnant women in rural southern Mozambique [16]. Although pregnancy and childbirth are traditionally considered as the women's domain, women often do not have independent access to maternal health care services due to economic dependency and gender inequality [17]. From the existing literature from LMICs it is unclear to what extent male partners are aware of danger signs, taking the final decisions, or providing financial and logistical support to reach health care services [18–20]. The majority of maternal health care studies gather data from women only while often the wider community, including the male partner, is involved when obstetric emergencies occur [21, 22]. In order to design and implement effective and comprehensive maternal health care programs, further insight into decision making and maternal health care knowledge at community level is highly needed.

Awareness of danger signs during pregnancy among both men and women has not been previously studied in southern Mozambique. Moreover, it is unclear what role men play in terms of decision making and financial support in this setting. This study aimed to assess decision making regarding maternal health care issues, financial support for ANC and delivery, and the knowledge of danger signs of both men and women of reproductive age at community level.

Methods

Study setting

The study took place in Maputo province in the neighbouring districts of Marracuene and Manhiça, which had respectively 84,975 and 157,642 inhabitants in 2007 [23]. Formal maternal healthcare is provided entirely by public health services in this area, organised by a broad network of primary health care centers with secondary and tertiary referral centers [15]. At least 94% of women in Maputo Province receive one ANC during pregnancy and 87.5% of women deliver in a health facility [15]. Teenage pregnancy is very common: 25.8% of women between 15 and 19 years old have already been pregnant [15]. The most common direct causes for maternal deaths in Mozambique are hemorrhage, sepsis and eclampsia and among indirect causes HIV and malaria infections take the lead [24–26]. Compared to the rest of the country, Maputo Province has a reasonable coverage of health care centers: 90% of the population has a health care center within a 1 h drive [27].

Study design

A cross-sectional descriptive survey was conducted between June and August 2017. The study was nested in a cohort study in which 383 households were followed over a period of 4 years (from 2014 until 2017) in Manhiça and Marracuene districts, Mozambique. All participants within the cohort study were questioned annually about family planning knowledge, attitudes and practices. Additional questions relating to the current study were included in the final round of data collection. The questionnaire can be found as an additional file [Additional file 1].

Sample size

Families were recruited through a simple, district-stratified random sampling process with allocation proportional to size within each stratum (as shown in Table 1). According to the National Institute of Statistics, 35,454 and 20,712 households lived in Manhica and Marracuene respectively in 2007. Based on the sample size calculation (as shown in Table 1) the aim was to include 383 households, of which 242 in Manhiça and 141 in Marracuene. Considering a traditional household usually consists of at least one man and one woman of reproductive age, the aim was to include 766 men and women.

Table 1 Stratified Sample Technique according to Haddad et al. (2004) for calculating the sample size [28]

District	Stratum Size (N_h)	Stratum Weight (W_h)	Sample (n_h)
Manhiça	35,454	0.63	242
Marracuene	20,712	0.37	141
Total	**56,166**	**1.00**	**383**

Data collection tool

The questionnaire consisted of questions regarding socio-demographic characteristics, knowledge of content of ANC, knowledge of danger signs during pregnancy and level of male involvement during pregnancy. The knowledge of content of ANC was assessed by the open-ended question: "What happens during ANC?". The items listed by the respondent were categorised by the interviewer under different categories. The categories (see Fig. 1) were based on the minimum package of services to be provided by antenatal care according to WHO and MoH guidelines [29, 30]. Items not fitting in these categories were noted under the option "others". Items listed under "others" were revised by the research team and if necessary added to a certain category after data collection. Tetanus vaccination, anaemia screening and intermittent preventive treatment of malaria were categorised under "other testing and treatments".

Responses regarding knowledge of danger signs was assessed by the open ended question: "What are the danger signs during pregnancy?". Responses were categorised by the interviewer under predetermined categories or noted under "others". Items listed under "others" were revised by the research team and if necessary added to another category after data collection. Final categories of danger signs included: 1. Vaginal bleeding 2. Convulsions or fitting 3. Severe headache and/or blurred vision 4. Fever 5. Painful urination 6. Severe abdominal/epigastric pain 7. Reduced fetal movements 8. Swelling of fingers, face, and legs 9. Abnormal vaginal discharge 10. Others (see Fig. 2). The category "others" included answers referring to a feeling of extreme weakness, weight loss or fast and difficult breathing. Abnormal vaginal discharge included responses referring to leaking amniotic fluid or discharge with itching or smell. The categorisation of danger signs was based on the WHO handbook for health care providers and evidence regarding knowledge of danger signs from Tanzania and Madagascar [31–33].

The selection of questions regarding male involvement was based on a literature review of relevant items that reflect male involvement during pregnancy and childbirth [20, 34, 35]. Different items were included: decision making regarding maternal health care issues, financial support for ANC and delivery, and male attendance at ANC consultations. Questions regarding decision making about ANC and delivery (see Table 3) only allowed for one response option; respondents were asked to select the final decision maker. Questions regarding financial support (see Table 3) about ANC and delivery were multiple option questions.

Data collection

A team of 21 local field workers received a five-day training on ethical issues and data collection procedures, terminology used in the questionnaire and correct

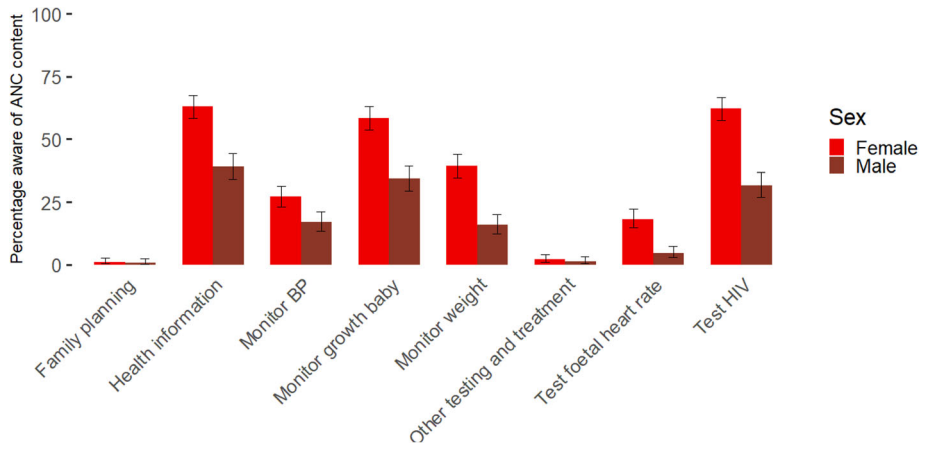

Fig. 1 Knowledge content ANC by sex in percentage with confidence intervals for proportions

translation to the local language (Changana). The team of fieldworkers went from door to door, interviewing all eligible members of the selected households included in the cohort with an electronic questionnaire using tablets. Before the start of the interview, all participants received information regarding the content and objective of the questionnaire, after which written consent was obtained. The questionnaire took on average 30 to 60 min. Inclusion criteria in the cohort study included: speaking Changana or Portuguese, being in a relationship and being between 15 and 49 years old.

Ethical issues

Ethical approval was obtained from the National Health Bioethics Committee of Mozambique ((187/CNBS/15), Health Bioethics Committee of Universidade Eduardo Mondlane and Hospital Central de Maputo (CIBS UEM&HCM/0008–17) and the Bioethics Committee of Ghent University Hospital (EC/2018/1319).

Data analysis

All data was analyzed using the statistical software package R. During data cleaning two data entries were deleted because the same participant was interviewed twice, resulting in a final dataset of 775 participants. The χ^2 test was used for comparing sociodemographic characteristics by sex. The x^2 test was also used for assessing a relationship between sex and a higher maternal health knowledge (dangers signs and content of ANC), together with confidence intervals for proportions (see Fig. 1 and Fig. 2). The Fisher exact test was computed for cell counts < 5. Descriptive statistics were used for exploring male presence at ANC, decision making and financial support during pregnancy and delivery. Only men and women who experienced a pregnancy in the last 5 years were included in the analysis regarding decision making, financial support and male participation at ANC to control for recall bias.

Within the group of participants that experienced a pregnancy in the last 5 years a subset was selected of

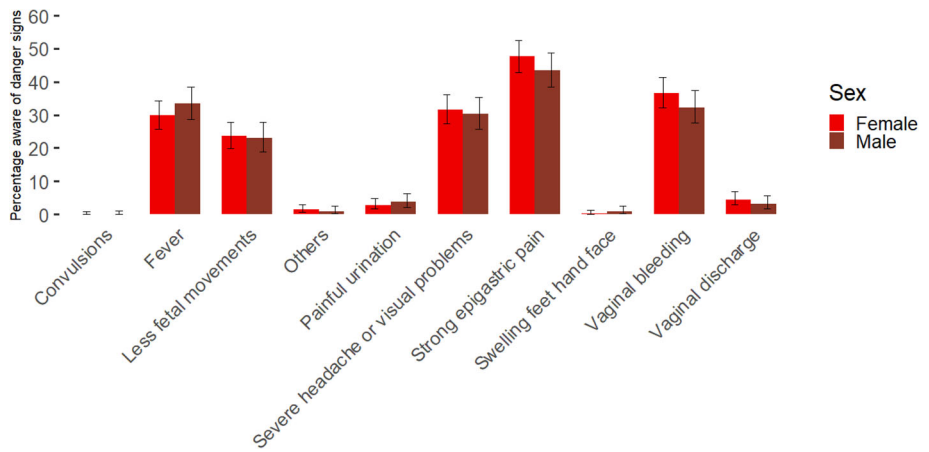

Fig. 2 Knowledge danger signs by sex in percentage with confidence intervals for proportions

couples that were linked based on the question "who is your partner/husband" and year of the last pregnancy. This subset was created for examining level of inter-rater agreement with regard to male presence at ANC, decision making and financial support during pregnancy and delivery. For decision making and financial support answers were categorised under "Man/Woman/Couple together/Others". Percent agreement was calculated by giving 0 if the man and woman of the same couple had conflicting results (eg the man says he was the final decision maker while the woman says they decided together) and 1 if they had corresponding results (eg the man says the woman was the final decision maker and the woman also says she made the final decision). Cohen's Kappa was also calculated to examine inter-rater reliability between man and women of the same couple, as it is recommended to use both percent agreement and Cohen's Kappa in health care studies [36].

A total score of knowledge of danger signs (ranging from 1 to 10) was calculated for all participants in the study by making the sum of danger signs listed by the participants. The Mann-Whitney U Test was used to compare the knowledge score of danger signs between men and women. We examined predictors of knowledge of danger signs for men and women that experienced a pregnancy in the last 5 years by building a binomial logistic regression model. Poor knowledge was defined as knowing less than two danger signs, this cut off value was based on the average number of danger signs respondents knew in this study (=2) and cut off values used in other studies about danger signs during pregnancy [37, 38]. Predictors included education, age, marital status, place of delivery of last child, number of antenatal care consultations during the last pregnancy, if they discussed antenatal care with their partner, male presence during ANC at the last pregnancy and number of living children. The Akaike information criterion (AIC) was used for model selection [39, 40]. *P*-values of less than 0.05 were considered to have significant association between the outcome and the explanatory variables, and P-values of less than 0.1 were considered borderline significant.

Results

Sociodemographic characteristics

The study involved 775 participants between the ages of 18 and 54 years, 347 men and 428 women. Four percent (33/808) of the approached participants refused to participate because of time constraints or not being interested. The mean age for men was 36 (ranging from 21 to 54) and for women 32 (ranging from 18 to 53). A total of 491 (63.35%) participants were living in Manhiça district and 284 (36.65%) in Marracuene district. Eight percent of women were in the youngest age category (18–21 years old) and only 1% of men. One in 20 men had followed higher education studies, while only 1 in 100 women had (see Table 2). All participants that did not obtain higher education ($n = 755$) were asked about the reason. The most prevalent reasons were pregnancy and financial reasons. A quarter (26.17%) of women had to stop their studies because of a pregnancy compared to 2% of men. About 69% of men had to stop their studies because of financial reasons, among women this was only 44%. A quarter (26.40%) of women were working in agriculture while only 3% of men had this source of income. More men (39%) were working in the private sector compared to women (5%). Overall women were less educated, younger and more often engaged in domestic work than men (see Table 2).

Maternal health characteristics

Ninety-nine percent ($n = 425$) of the women had ever been pregnant and 98.27% ($n = 341$) of the men had got a partner pregnant. More than one in three ($n = 261$) of the reported pregnancies were unplanned and 55.94% ($n = 146$) of those unplanned pregnancies were wanted. One hundred forty (18.06%) of the people interviewed had experienced one abortion (spontaneous or induced) with their last partner, 40 (5.16%) two abortions and 7 (0.90%) three abortions or more. A total of 724 respondents (94.51%) had their last child delivered in a health facility, 26 at home, 11 on the road, one in church and three male respondents answered they did not know. For 678 (88.51%) respondents their last child was born by normal vaginal delivery, 60 (7.83%) by vaginal delivery with complications, 26 (3.39%) by caesarean section and two (0.26%) respondents did not know.

Male involvement in maternal health

Seventy-three percent ($n = 564$) of the participants experienced a pregnancy in the last 5 years, 253 men and 311 women. These participants were asked about decision making, financial support and male attendance during their last pregnancy and delivery. Three percent ($n = 8$) of men said their wives never went to ANC. Of the 245 men whose wives attended ANC, 38.31% ($n = 95$) said they had accompanied her to ANC at least once. Of the women who had been pregnant in the last 5 years, 3.91% ($n = 13$) said they never went to ANC and 30.17% ($n = 91$) of those who went to ANC said their husband had accompanied them at least once. More than three in four women or 77.17% ($n = 240$) would like to have their husband present and 85.26% ($n = 214$) of men would like to be present during ANC.

Almost half of the women (47.88%) said they were the final decision makers regarding going to ANC but only a quarter of men (24.70%) said their wife made the final

Table 2 Sociodemographic characteristics of the study participants

Sex	Men N = 347		Women N = 428		X^2 test	*P*-Value
Educational level	**n**	**%**	**n**	**%**	$X^2 = 22.26$ (d.f. = 5)	$p < 0.001$
No education	35	10.09	73	17.06		
Primary school (at least 1 year but not finished)	86	24.78	124	28.97		
Primary school (finished)	107	30.84	101	23.60		
Secondary school (at least 1 year but not finished)	81	23.34	104	24.40		
Secondary school (finished)	22	6.34	22	5.14		
Higher education	16	4.61	4	0.93		
Marital Status					$X^2 = 6.26$ (d.f. = 4)	$p = 0.18$
Single	18	5.19	16	3.74		
Monogamous relationship/Married	292	84.15	362	84.58		
Polygamous relationship/Married	7	2.02	6	1.40		
Divorced/Separated	29	8.36	35	8.18		
Widow	1	0.29	9	2.10		
Religion					$X^2 = 6.74$ (d.f. = 6)	$p = 0.35$
Catholic	34	9.80	37	8.64		
Islam	8	2.31	10	2.34		
Zione	85	24.50	129	30.14		
Protestant	171	49.28	195	45.56		
Independent Christian church	37	10.66	49	11.45		
No religion	12	3.46	7	1.64		
Others	0	0	1	0.23		
Age**						
18–21	4	1.15	34	7.94	$X^2 = 46.94$ (d.f. = 3)	$p < 0.001$
> 21–25	34	9.80	75	17.52		
> 25–35	136	39.19	190	44.39		
> 35	173	49.86	129	30.14		
Occupation**					$X^2 = 365.23$ (d.f. = 10)	$p < 0.001$
Public sector (exc. Agriculture)	27	7.78	8	1.87		
Private sector (exc. Agriculture)	135	38.90	22	5.14		
Own business	102	29.39	70	16.36		
Agriculture (commercialized)	8	2.31	14	3.27		
Agriculture (own usage)	10	2.88	113	26.40		
Housekeeper	8	2.31	14	3.27		
Student	1	0.29	6	1.40		
Seasonal worker	18	5.19	2	0.47		
Unemployed	9	2.59	7	1.64		
Homemaker/housewife	0	0	159	37.15		
Others	29	8.36	13	3.04		

Levels of significance:. = $p < 0.1$; * = $p < 0.05$; ** = $p < 0.01$

decision. Only 14.01% of the women said the male partner took the final decision, while 26.29% of men said they were the final decision makers (see Table 3). A majority of women said financial support for ANC came from their partner (79.80%) while only 51% of men said they were providing financial support (see Table 3). Between 0 and 2.3% of respondents (some variation according to sex and topic) stated the parents or parents-in-law were the final decision makers in maternal health care issues. Financial support for antenatal care and

Table 3 Decision making and financial support during pregnancy and delivery among participants experiencing a pregnancy in the last 5 years

Sex	Men (*N* = 253)		Women (*N* = 311)	
Decisions concerning ANC are taken by	n	%	n	%
Man	66	26.09	149	47.91
Parents-in-law	1	0.40	3	0.96
Other children	0	0.00	0	0.00
Parents	0	0.00	4	1.29
Woman	63	24.90	42	13.50
Couple together	116	45.85	94	30.23
Siblings	0	0.00	0	0.00
Others	7	2.77	19	6.11
Financial support for ANC (transport and other costs) comes from[a]				
Man	128	50.59	249	80.06
Parents-in-law	3	1.19	3	0.96
Other children	0	0.00	0	0.00
Parents	2	0.79	5	1.61
Woman	94	37.15	17	5.47
Couple together	26	10.28	30	9.65
Siblings	0	0.00	0	0.00
Nobody	2	0.79	6	1.93
Others	1	0.40	1	0.32
Decision about place of birth is taken by				
Man	52	20.55	46	14.79
Parents-in-law	5	1.98	6	1.93
Other children	0	0.00	0	0.00
Parents	2	0.79	7	2.25
Woman	57	22.53	128	41.16
Couple together	124	49.01	98	31.51
Siblings	1	0.40	1	0.32
Others	12	4.74	25	8.04
Savings during pregnancy for the delivery are done by[a]				
Man	117	46.25	199	63.99
Parents-in-law	3	1.19	9	2.89
Other children	0	0.00	0	0.00
Parents	4	1.58	9	2.89
Woman	85	33.60	40	12.86
Couple together	39	15.42	46	14.79
Siblings	1	0.40	1	0.32
Nobody	8	3.16	10	3.22
Others	1	0.40	1	0.32

[a]More than one response possible

delivery from parents and parents-in-law was also minimal, ranging between 0 and 3%.

Among women, 41.04% said they took the final decision about the place of birth, while 20.32% of men said their wife was the final decision maker. One third of women (31.60%) said it was a joint decision with the partner, while half of the men (49.40%) said it was a joint decision (see Table 3).

Agreement between men and women

Within the group of participants that experienced a pregnancy in the last 5 years, 164 couples (in which both men and women were interviewed) could be identified. We examined the level of agreement (see methods for calculation method of "agreement") between men and women within this group regarding male presence at ANC during the last pregnancy, decision making and financial support for pregnancy and delivery (see Table 4). We found the highest level of agreement (both percentage of agreement and Cohen's Kappa) for male presence at ANC, but still the K value was below the often considered acceptable threshold of 0.41 [41]. Overall, we observed a low agreement in what men and women responded. For savings during pregnancy the *P*-value was below 0.05, which means there was no significant association between the responses of men and women (of the same couple).

Maternal health knowledge: ANC content and danger signs

All participants were asked if they knew what happens during an antenatal care consultation and to list what happens during an ANC consultation. 44.09% percent of men and 8.88% of women did not know what happens during ANC. In Fig. 1 an overview of the listed items can be found by sex (with all participants as denominator). There was a significant difference between men and women regarding knowledge about what happens in ANC for almost all listed items: monitoring blood pressure ($x^2 = 10.61178$, d.f. = 1, $p = 0.001$), monitoring growth of the baby ($x^2 = 41.83313$, d.f. = 1, $p < 0.001$), monitoring weight of the mother ($x^2 = 49.45005$, d.f. = 1, $p < 0.001$), providing health information ($x^2 = 46.25236$, d.f. = 1, $p < 0.001$), testing the foetal heart rate ($x^2 = 32.06$, d.f. = 1, $p < 0.001$) and HIV testing ($x^2 = 69.91854$, d.f. = 1, $p < 0.001$). Only regarding family planning counselling ($x^2 = 0.003$, d.f. = 1, $p = 0.95$) and other testing ($x^2 = 0.07$ d.f. = 1, $p = 0.80$) there was no difference between men and women, but cell counts were very low. Under the category "other testing and treatment", malaria testing and prevention was most commonly cited and two women also specifically mentioned receiving a bednet.

Participants were asked if they knew any danger signs during pregnancy and to list them. The percentage of men and women that knew certain danger signs can be found in Fig. 2. One danger sign, fitting or convulsions, was not mentioned by any participant. Knowledge of danger signs did not significantly differ between men and women: swollen feet/hands/face ($x^2 = 0.51$, d.f. = 1, $p = 0.47$), extreme weakness ($x^2 = 0.17$, d.f. =1, $p = 0.68$), painful urination or abnormal vaginal discharge ($x^2 = 0.00$, d.f. = 1, $p = 0.95$), strong epigastric pain ($x^2 = 1.17$, d.f. = 1, $p = 0.28$), less fetal movements ($x^2 = 0.01$, d.f. = 1, $p = 0.93$), fever ($x^2 = 0.95$, d.f. = 1, $p = 0.33$), headache or visual problems ($x^2 = 0.09$, d.f. = 1, $p = 0.76$) and bleeding ($x^2 = 1.45$, d.f. = 1, $p = 0.23$). The average number of danger signs respondents knew was 2.05 (2.00 for men and 2.08 for women), with the difference between men and women not being significant (U = 71,130, *p*-value = 0.294).

Predictors of knowledge of danger signs were examined by building a binomial regression model for men and women separately, with only men and women being pregnant in the last 5 years included. Communication with the partner about ANC was a significant predictor for increased knowledge of danger signs for both men and women (see Tables 5 & 6). We also found that women that did not know how many ANC visits they made in their last pregnancy had lower knowledge about danger signs during pregnancy (see Table 6). For women the number of children was a borderline significant predictor, women with more children had lower knowledge of danger signs. Education, age, marital status, place of last delivery and male attendance during ANC were not significant predictors for knowledge of danger signs.

Discussion

This study sheds light on men's and women's knowledge, decisions and behaviour related to some critical maternal health care issues in Mozambique. It is important to note that relatively few maternal health care studies collect data from male partners directly [20], while our study shows men and women often have different views on decision making, financial support and presence at antenatal care consultations. As a consequence, data on male attitudes, knowledge or behaviour in

Table 4 Inter rater reliability by percentage of agreement and Cohen's Kappa among couples

	Percentage Agreement		Cohen's Kappa	
	n	%	K	*p*-value
Male presence at ANC	107	65.24	0.242	0.0017
Person who takes final decisions concerning ANC	60	36.58	0.095	0.0414
Person who financial support for ANC comes from (transport and other costs)	84	51.21	0.105	0.0085
Person who takes final decision about place of birth	64	39.02	0.124	0.0072
Person who makes savings during pregnancy for the delivery	65	39.63	0.037	0.43

Table 5 Predictors of knowledge of danger signs of men with their coefficients of the binomial regression model

Variables	Poor knowledge of danger signs (0 or 1) % (n)	Some Knowledge (2 or more) % (n)	Beta coefficient	*P*-Value
Education				
No	31.58(6)	68.42(13)	REF	REF
Primary Level	39.02(80)	60.98(125)	−0.32	0.57
Secondary Level	43.75(7)	56.25(9)	−0.31	0.68
Higher	23.08(3)	76.92(10)	−0.24	0.29
Age				
18–21	33.33(3)	66.67(6)	REF	REF
21–25	44.44(12)	55.56(15)	−1.02	0.23
25–35	38.94(44)	61.06(69)	−0.55	0.48
> 35	35.58(37)	64.42(67)	−0.63	0.43
Marital Status				
Single	37.14(13)	62.86(22)	REF	REF
In relationship	38.07(83)	61.93(135)	−0.13	0.76
Place of last delivery				
Hospital	37.92(91)	62.08(149)	REF	REF
At home	38.46(5)	61.54(8)	0.06	0.92
Number of ANC visits				
0 ANCs	37.50(3)	62.50(5)	REF	REF
< 4 ANCs	28.57(10)	71.43(25)	0.24	0.78
> =4 ANCs	29.36(32)	70.64(77)	0.13	0.87
Don't know	50.50(51)	49.50(50)	−0.58	0.47
Communication regarding ANC*				
No	53.09(43)	46.91(38)	REF	REF
Yes	30.81(53)	69.19(119)	0.73	0.01
Male attendance last pregnancy				
No	43.23(67)	56.77(88)	REF	REF
Yes	29.59(29)	70.41(69)	0.32	0.29
Number of children alive				
0–2	32.35(11)	67.65(23)	REF	REF
3–5	38.51(62)	61.49(99)	−0.30	0.49
> 5	39.66(23)	60.34(35)	− 0.39	0.43

Levels of significance:. = $p < 0.1$; * = $p < 0.05$; ** = $p < 0.01$

maternal health care issues deriving from women only should be interpreted with caution.

The sociodemographic data of our study population showed that women are often younger at the first pregnancy compared to men, more often have to stop their education because of pregnancy and are more often engaged in informal jobs. This is in line with other studies in Mozambique demonstrating that women are still disadvantaged in terms of education, employment and income [16, 42]. As a result women often rely on their partners for financial support in their daily life [16]. However, the rapid urbanization in southern Mozambique may also lead to an enhanced socio-economic space for women, as women seem to have more socio economic power and possibilities in cities [42]. Our study demonstrates that decisions regarding ANC and delivery are mostly taken by women, followed by the couple jointly. Although women might take the lead in these decisions, the majority of them report that they rely on their partner for providing financial support regarding antenatal care and delivery (80 and 64% respectively). In contrast to some qualitative studies in the region [16, 43] the role of mothers–in-law seems relatively small in terms of decision making and financial support.

Our study showed a high level of male participation at ANC, much higher than the figures reported

Table 6 Predictors of knowledge of danger signs of women with their coefficients of the binomial regression model

Variables	Poor knowledge of danger signs (0 or 1) % (n)	Some Knowledge (2 or more) % (n)	Beta coefficient	*P*-Value
Education				
No	31.43(11)	68.57(24)	REF	REF
Primary Level	28.46(72)	71.54(181)	−0.07	0.86
Secondary Level	30.00(6)	70.00(14)	−0.27	0.65
Higher	66.66(2)	33.33(1)	−1.07	0.46
Age				
18–21	29.55(13)	70.45(31)	REF	REF
21–25	29.51(18)	70.49(43)	0.01	0.99
25–35	29.61(45)	70.39(107)	0.02	0.98
> 35	27.78(15)	72.22(39)	0.24	0.62
Marital Status				
Not in relationship	28.89(13)	71.11(32)	REF	REF
In relationship	29.32(78)	70.68(188)	−0.14	0.73
Place of last delivery				
Hospital	29.35(86)	70.65(207)	REF	REF
At home	27.78(5)	72.22(13)	0.32	0.59
Number of ANC visits*				
0 ANCs	53.85(7)	46.15(66	REF	REF
< 4 ANCs	32.08(17)	67.92(36)	0.87	0.18
> =4 ANCs.	28.38(63)	71.62(159)	1.03	0.08
Don't know*	17.39(4)	82.61(19)	1.73	0.03
Communication regarding ANC*				
No	40.00(30)	60.00(45)	REF	REF
Yes*	25.85(61)	74.15(175)	0.68	0.03
Male attendance last pregnancy				
No	31.82(70)	68.18(150)	REF	REF
Yes	23.08(21)	76.92(70)	0.33	0.32
Number of children alive				
0–2	17.07(7)	82.93(34)	REF	REF
3–5.	30.57(59)	69.43(134)	−0.88	0.06
> 5.	32.47(25)	67.53(52)	−0.95	0.06

Levels of significance:. = $p < 0.1$; * = $p < 0.05$; ** = $p < 0.01$

in other studies. This might be related to participants' understanding of "going with your wife to ANC". A qualitative study about male involvement in southern Mozambique showed that men and women often consider male accompaniment to include going with your partner until the gate of the clinic [44] and similarly an Ethiopian study reported different understandings of male accompaniment at ANC [18]. Moreover, only 64% of the couples gave the same answer to this question, indicating that men and women may have different interpretations. Socially desirable answers might have also contributed to this result.

Both men and women show a high willingness for male participation at ANC in our study, but some persistent barriers and potential negative consequences might deter their actual presence at ANC. Research demonstrates that health care centres in rural Mozambique already struggle to offer high quality ANC [7] and receiving a high number of male partners will create additional challenges. Moreover, couples attending ANC are often assumed to be HIV positive by the community, with the associated stigma [44, 45]. Finally, and importantly, a qualitative study in the region emphasized women are often treated in an inferior manner to men by health care providers when both are present

in the consultation [44]. To tackle these barriers to male involvement in maternal health while also promoting gender equality, tailored programs at different levels will be needed.

Overall we noted that men often believed they played a more important role in maternal health care issues (regarding decision making and participation in ANC) than reported by their female counterparts. Furthermore, we observed that men and women each believed that it was their partner's responsibility to prepare savings for the delivery and organise financial support for ANC (which might indicate no one was actually assuming responsibility for this). For savings during pregnancy for example, the majority of women said the partner kept money aside (64%) while only 46% percent of men said they did so.

Universal access to ANC offers an opportunity to encourage women to deliver within a health facility, and can function as an entry point for health care for the whole family [46]. Notably, almost all women (97%) in our study had accessed antenatal care in their last pregnancy, which is a promising result in terms of ANC coverage. Our study revealed which components of ANC are most commonly known by women and their partners. Health promotion (such as nutritional advice), monitoring of the growth of the baby (by measuring fundus height) and HIV testing were the most commonly known ANC interventions among women (> 50%) and their partners (> 25%). Nevertheless, some crucial interventions were much less known such as hypertension screening and malaria prevention and treatment. Our study thereby confirms the results of other studies in Mozambique showing that blood pressure screening is often neglected by providers or impossible due to lack of equipment [6, 7]. As we expected, women knew more about the content of ANC compared to men. This supports the view that ANC is often considered as women's business [47] and men are much less exposed to and familiar with ANC.

In contrast with knowledge of ANC content, the knowledge of danger signs during pregnancy did not differ between men and women. Moreover, knowledge was very low and did not correlate with presence at ANC (either of the woman or her partner). Low knowledge of danger signs among women was also reported in studies in Madagascar, Tanzania and Ethiopia and often indicates overall poor quality of antenatal care [33, 38, 48]. Assessment of knowledge of danger signs among men is rarely carried out within maternal health care research, although it is well known that they play a major role in the referral of pregnant women in case of emergencies. One study in Tanzania indicated low knowledge amongst men, but this was not compared with women's knowledge in the same setting [38]. We believe our study is the first to examine differences between men and women regarding knowledge of danger signs in Sub-Saharan Africa. Since principally women are targeted in maternal health care programs we would have expected a higher level of knowledge among women [49] but this was not the case. The low level of knowledge of danger signs among both men and women suggests that counselling on danger signs during ANC is not routinely carried out or does not increase women's knowledge. DHS data from 2015 in Mozambique demonstrated only 39% of women were counselled on danger signs during ANC, and our results suggest this proportion has not significantly changed in 2017. Given that knowledge of danger signs is an essential step in the timely referral of pregnant women in case of emergencies (often called the first delay), this is definitely an aspect of ANC that needs more attention. The fact that men will often act as gatekeepers to safe maternity care should be taken into account when designing education, communication and information programs for improving maternal and neonatal health outcomes. The inclusion of men in maternal health care programs is still often neglected, while the International Conference on Population and Development (ICPD) already argued in 1994 that special efforts should be made to emphasize on men's shared responsibility and active involvement in maternal and child health [50].

Communication about antenatal care within the couple was a significant predictor for better knowledge of danger signs among both men and women. Several possible mechanisms might explain the link between communication and knowledge. First, awareness of danger signs may have provided the couple with the opportunity to start conversations about the pregnancy and content of ANC. Second, the fact that they communicate about the content of ANC might have increased their knowledge. While the positive effect of couple communication on consistent family planning usage has been demonstrated [51, 52], this has been much less studied in terms of ANC attendance, maternal health care knowledge and skilled birth attendance. In light of the findings of our study we suggest that male involvement programs also keep track of "soft" indicators of male involvement such as couple communication, interest of the partner and shared decision making to evaluate their programs, instead of focusing on male participation in ANC visits as the main core indicator especially because the latter is often interpreted differently by different actors (such as the woman, partner and health care provider).

Our study has several limitations worth noting. The study was nested within the third annual round of a cohort study. Therefore all participants had already reached the age of 18 years old by the time we included them in this study. According to DHS data of 2015, 44% of Mozambican girls had been pregnant at least once by

the age of 17 [15]. Consequently our study is biased by only gathering data from participants 18 years old and above. Another shortcoming of our study was the absence of questions regarding income or financial stress in our questionnaire, which means we could not assess a potential association between economic status and knowledge of danger signs. Especially for the association between having more children and lower knowledge of danger signs we suspect that economic status might have been a confounding factor, but we were unable to verify this hypothesis. Another methodological limitation is our measurement of knowledge of danger signs. In line with other studies we took knowledge of less than 2 danger signs as cut-off point, but this is an arbitrary and unnuanced approach. Future studies should explore the design of a more refined and validated instrument for measuring knowledge of danger signs during pregnancy and childbirth.

Lastly, it should be taken into account that this study was conducted in Manhica and Marracuene, two districts close to the capital, a region that is advantaged in terms of economic resources compared to the rest of the country. In addition, Northern Mozambique has a matrilineal marital, kinship and inheritance system while southern Mozambique has a patrilineal system [53]. Taking into account these regional differences, our findings cannot be generalized to other parts of the country.

Conclusions

This study shows that men play an important role in decision making and financial support in maternal health care issues in southern Mozambique. The role of parents, parents-in-law and neighbors was rather small. Couples often had different opinions on who took the decisions, who provided financial support and male participation in antenatal care. This finding of disagreement within couples is interesting as many maternal health care studies rely on women's reports only for assessing the role of the male partner [20]. We recommend that future maternal health care research should collect more data from men directly and assess male involvement more broadly than presence at ANC. This study showed a high willingness for more male participation at ANC by both men and women, which should encourage policy-makers to invest in multilevel tailored interventions tackling current barriers. Improving maternal health care knowledge in the community can improve maternal health outcomes and should go hand in hand with the promotion of male involvement and gender equality.

Supplementary information

Supplementary information accompanies this paper at https://doi.org/10.1186/s12884-020-03265-4.

Additional file 1. Questionnaire. Description: The questionnaire used for the current study in Portuguese and English.

Abbreviations

AIC: Akaike information criterion; ANC: Antenatal Care; ICPD: International Conference on Population and Development; LMIC: Low and Middle Income Countries; MCH: Mother and Child Health; MDGs: Millennium Development Goals; MMR: Maternal Mortality Ratio; MoH: Ministry of Health; SDGs: Sustainable Development Goals; UEM: Universidade Eduardo Mondlane; WHO: World Health Organization

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Authors' contributions

AG developed the data collection instrument, supervised data collection and drafted the manuscript. MDM assisted in developing the data collection instruments and supervision of data collection. OD, KR, SG and NO assisted in data analysis and interpretation of the results. All authors revised the manuscript critically and read and approved the final manuscript.

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Availability of data and materials

For guaranteeing anonymity and confidentiality of our participants the dataset used and analyzed during the current study are only available from the corresponding author upon reasonable request.

Ethics approval and consent to participate

Ethical approval for the study was obtained by both the National Health Bioethics Committee of Mozambique and Bioethics Committee of Ghent University. All participants gave their written consent.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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Publisher's Note

Chapter 5

The conceptualisation of male involvement in maternal health from a global perspective.

5.1 Which definitions and indicators have been used in the scientific literature in the last 20 years for assessing male involvement in maternal health.

A systematic review of the concept "male involvement in maternal health" by natural language processing and descriptive analysis

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SUMMARY

What is already known?

-Increasing male involvement (MI) in maternal health (MH) is considered to be a promising and effective intervention for improving maternal and newborn health outcomes.

-Male involvement is described as a multifaceted concept in the quantitative literature, although a multidimensional evidence-based set of indicators is lacking.

-In qualitative literature male involvement is often described by men and women from different settings as the male partner "being there" , meaning giving physical and emotional support.

What are the new findings?

-Conceptualisation of male involvement in maternal health in the literature is done by focusing on either the psychosocial aspects or on maternal health care utilisation. The attention given to one or both aspects resulted in the use of different indicators and depended on the geographical context of the study.

-Overall male involvement was most often measured by instrumental actions such as presence at health services, financial support or providing transport. Other aspects of male involvement, such as communication, emotional support and shared decision making have received little attention, especially in low- and middle-income countries.

What do the new findings imply?

-More research into other aspects of male involvement (such as the subjective feeling of perceived support and shared decision making) can broaden the potential of male involvement programs and also reveal and minimize potential negative side-effects of male involvement interventions.

-A more holistic assessment of MI in MH, exploring different aspects of male involvement, could facilitate researchers to generate more robust findings, strengthening the existing evidence on male involvement programmes.

BMJ Global Health

Systematic review of the concept 'male involvement in maternal health' by natural language processing and descriptive analysis

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ABSTRACT

Introduction Experts agree that male involvement in maternal health is a multifaceted concept, but a robust assessment is lacking, hampering interpretation of the literature. This systematic review aims to examine the conceptualisation of male involvement in maternal health globally and review commonly used indicators.

Methods PubMed, Embase, Scopus, Web of Science and CINAHL databases were searched for quantitative literature (between the years 2000 and 2020) containing indicators representing male involvement in maternal health, which was defined as the involvement, participation, engagement or support of men in all activities related to maternal health.

Results After full-text review, 282 studies were included in the review. Most studies were conducted in Africa (43%), followed by North America (23%), Asia (15%) and Europe (12%). Descriptive and text mining analysis showed male involvement has been conceptualised by focusing on two main aspects: psychosocial support and instrumental support for maternal health care utilisation. Differences in measurement and topics were noted according to continent with Africa focusing on HIV prevention, North America and Europe on psychosocial health and stress, and Asia on nutrition. One-third of studies used one single indicator and no common pattern of indicators could be identified. Antenatal care attendance was the most used indicator (40%), followed by financial support (17%), presence during childbirth (17%) and HIV testing (14%). Majority of studies did not collect data from men directly.

Discussion Researchers often focus on a single aspect of male involvement, resulting in a narrow set of indicators. Aspects such as communication, shared decision making and the subjective feeling of support have received little attention. We believe a broader holistic scope can broaden the potential of male involvement programmes and stimulate a gender-transformative approach. Further research is recommended to develop a robust and comprehensive set of indicators for assessing male involvement in maternal health.

Key questions

What is already known?

- Increasing male involvement (MI) in maternal health (MH) is considered to be a promising and effective intervention for improving maternal and newborn health outcomes.
- MI is described as a multifaceted concept in the quantitative literature, although a multidimensional evidence-based set of indicators is lacking.
- In qualitative literature MI is often described by men and women from different settings as the male partner 'being there', meaning giving physical and emotional support.

What are the new findings?

- Conceptualisation of MI in MH in the literature is done by focusing on either the psychosocial aspects or on MH care utilisation. The attention given to one or both aspects resulted in the use of different indicators and depended on the geographical context of the study.
- Overall MI was most often measured by instrumental actions such as presence at health services, financial support or providing transport. Other aspects of MI, such as communication, emotional support and shared decision making, have received little attention, especially in low-income and middle-income countries.

What do the new findings imply?

- More research into other aspects of MI (such as the subjective feeling of perceived support and shared decision making) can broaden the potential of MI programmes and also reveal and minimise potential negative side effects of MI interventions.
- A more holistic assessment of MI in MH, exploring different aspects of MI, could facilitate researchers to generate more robust findings, strengthening the existing evidence on MI programmes.

BACKGROUND

Since the 1994 Cairo Conference, where men's involvement in contraception, family planning, maternal health and child health was emphasised, research has increasingly paid attention to men's role, responsibilities

and behaviour in sexual and reproductive health.[1] Evidence about the positive impact of male involvement (MI) in maternal health on maternal and child health outcomes has been widely published in the last decade[2–6] and recently WHO included active involvement of men during pregnancy, child birth and the postpartum period as an effective strategy to improve maternal as well as newborn health outcomes in their 2015 recommendations on maternal and newborn health (MNH) promotion interventions.[7]

However, no common set of evidence-based indicators exists for assessing MI in maternal health, despite considerable evidence about the positive impact. Researchers seem to agree that MI is a multifaceted term but the concept itself has taken different forms according to the context and researcher's interest. Looking through the lens of Prevention of Mother to Child Transmission (PMTCT) programmes, for example, researchers often focus primarily on male presence at antenatal care (ANC) and HIV testing[3 8–10] as the core indicators for MI, without paying attention to other aspects of involvement in maternal health. This single measurement assumes that male partner presence is always a positive action and that men who do no not attend services are inherently 'not involved'.[11] However, it is well known that in many health systems men face multiple barriers to being present during ANC such as privacy issues, overcrowded ANC consultations, stigmatisation and strong prevailing gender norms.[12–14] Consequently, the fact that he is or not present might not correspond to his intentions of being involved or actual (supportive or unsupportive) behaviour outside the health facility. Limited research has also highlighted the negative side of male presence at ANC.[12 15 16] In some cases it might be an act of dominance and control, thereby limiting women's ability to actively participate in the conversation during the ANC consultation.[12] All these arguments should be taken into account when measuring MI based on a single indicator.

Looking at the qualitative literature there seems to exist some consensus regarding the meaning of MI globally, with slightly different accents according to the context. A study in rural South Africa showed that MI was understood as giving instrumental support to female partners through financial help, helping with physical tasks and providing emotional support.[17] In Mozambique, MI was seen as 'taking care of the family' in various ways such as providing financial support, making the decisions and showing love towards the partner.[12] In two Arabic countries, MI was described as being accessible, present and available in addition to being supportive and encouraging.[18] Studies from the USA found that MI meant 'being there', both emotionally and physically, by doing household chores or listening attentively to the woman's concerns.[19 20] African-American parents in the USA summarised MI as being present, accessible, available, understanding, willing to learn about the pregnancy process and eager to provide emotional, physical and financial support.[21] Despite the common construct of 'being there', often meaning supporting financially, emotionally and being physically present, this has not yet been translated into a set of robust quantitative indicators for measuring MI. Nevertheless more recently studies have started to construct composites or a collection of indicators for measuring MI, instead of focusing on a single item.[22 23] Furthermore, factors such as financial support, birth preparedness, decision making and participation in household chores have been included as MI indicators. Some studies also included reports of the male partner himself, often resulting in contradicting findings between men and women.[24]

Despite the growing number of studies in the field of MI in maternal health, no consensus exists regarding the number and content of indicators for assessing MI in maternal health, although several authors have argued that evidence based indicators are necessary for improving the quality of the available evidence.[3 16 25] With this review, we want to explore to what extent the research community has assessed different dimensions of MI in maternal health and which patterns we can identify in the selection of indicators globally. Only by looking at MI through a broader lens can potential implications of MI interventions on different outcomes such as gender equality, psychosocial health (PSH) and couples birth preparedness be explored and improved.

The primary aim of this systematic review is to examine the conceptualisation of MI in maternal health in the quantitative literature of the last 20 years. As secondary objective we want to critically review and discuss commonly used indicators.

METHODS

Protocol and registration

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement of 2015 guidelines. The protocol was submitted on the 22 February to International prospective register of systematic reviews (PROSPERO) and published online on the 10 July 2020 under registration number CRD42020169078. Due to the COVID-19 crisis, the PROSPERO register was prioritising submissions related to COVID-19, causing a delay in the registration.

Eligibility criteria

The systematic review included all types of quantitative studies involving indicators or variables representing MI in maternal health published in the last 20 years. MI was defined as the participation, engagement or support of men in all activities related to maternal health. Maternal health was defined according to WHO as the period from conception until 6 weeks after childbirth, thus covering pregnancy, childbirth and the postpartum period.

A search strategy was developed by AG with inputs from OD. This search was refined with the help of the librarian of Ghent University. The systematic review

involved a literature search of the PubMed, Embase, Scopus, Web of Science and CINAHL databases for peer-reviewed journal articles. Iterative modifications to the original search strategies were conducted, to assure that the observed variations in terminology were adequately reflected in both the index terms and the text-based queries for each database. A final search was conducted on the first of May 2020. Grey literature was identified through the WHO Reproductive Health Library and using Google with relevant keywords. The search strategy for PubMed can be found in online additional file 1. The outputs of the search were exported to Mendeley desktop V.1.16.1, and duplicates were removed. Subsequently, the titles and abstracts of the studies were imported into Rayyan. Two rounds of screening were applied, first, by title and abstract, followed by full text. Two reviewers independently screened and appraised all eligible articles using preset criteria, and in case of disagreement consensus was reached through discussion. Exclusion criteria were: using only qualitative methodology, systematic review studies, conference abstracts, data collection only in the postpartum period (without any assessment during pregnancy or childbirth), articles without any measurement of the role of the partner, non-English language articles, and studies limited to testing of the male partner for HIV or other sexually transmitted infections without mentioning male support, involvement, engagement or participation. While originally also qualitative studies with a clear conceptualisation of MI were included, it was decided to exclude all qualitative studies for this particular review during the first screening phase because they required a different approach of data extraction and analysis.

In the second stage of screening, full texts were obtained for the screened abstracts. If the article was unavailable through an online search, the article reach system of Ghent University was used to obtain the articles or the authors were contacted to request the full text publication. The same criteria were applied for inclusion and exclusion as in the first stage of screening together with a quality appraisal.

Quality assessment

Papers selected for retrieval in the second stage were assessed by two independent reviewers for methodological validity prior to inclusion in the review, using standardised critical appraisal instruments from the Joanna Briggs Institute (including the checklist for analytical cross sectional studies, cohort studies, prevalence studies, quasi-experimental studies, randomised controlled trials, case–control studies and systematic reviews). Studies with a score below 50% were excluded, because they often lacked essential information for this review. A relatively low threshold was used for inclusion because we wanted to examine the concept of MI used by the wider scientific community on a global scale, rather than limiting our results to a few high-quality studies.

Data extraction and analysis

A pretested data extraction framework in Microsoft Excel was used to extract and chart data from the reviewed articles. The standard data extraction table included authors, publication year, topic of study, the exact term used for describing MI in the study, study design, geographical location of study, definition of MI (if given), indicators used for measuring MI, data sources and quality assessment. Only indicators used in more than five of the included studies were retrieved for the results section and studies referring to a scale of more than 10 items (always psychosocial scales) were categorised as 'psychosocial scale measurement (>10 items)'. Data extraction of every article was done by a team of three researchers. AG screened all articles and GP and TVS independently each screened 50% of the articles. Disagreement (<10%) was resolved by discussion or consultation with one of the supervisors (OD) if needed. Topic allocation was done by an overall thematic analysis of the article, more specifically by reflecting on which particular aspect of maternal health the study was focusing. The topics were inductively created and discussed until agreement was reached among the three reviewers responsible for data extraction. After an initial phase of renaming and discussing the topics, eventually all articles were given one of the following four 'core topics': PMTCT, PSH, abortion and MNH. Articles were categorised as PMTCT if they focused on care for women living with or at risk of HIV (to maintain their health and prevent transmission to their babies), including studies focusing on male HIV testing and prevention. PSH categorised studies focused on social and emotional aspects of male partners' role in maternal health, mainly consisting of articles regarding perinatal depression and stress. Studies categorised as abortion focused on women considering or having experienced an induced or spontaneous abortion. The topic MNH included all studies focusing on MI in MNH, excluding the previous categories (PMTCT, PSH or abortion). The data of the data extraction sheet were cleaned and subsequently analysed using descriptive statistics (more specifically frequencies) and examining associations by inferential statistics. Fisher's exact test was used for assessing differences in the main topic according to terminology and according to continent. In addition, CIs were calculated for visualising differences in proportions in the in use of indicators according to terminology.

For visualisation and confirmatory analysis of the data from the included articles, text mining by R with the tidytext package was used for natural language processing,[26] and both the ggplot package in R and matplotlib package in Python for the graphs. The decision to conduct these analysis was taken after the final screening phase, motivated by the high number of included articles and the nature of the data (including different underlying topics and patterns). First a test set of 20% of the data was used for writing the text mining scripts, which were refined once the full dataset was entered. The statistic 'term frequency-inverse document frequency' (tf-idf) in

combination with n-grams was calculated for assessing the importance and structure of certain word combinations within the collection of articles (referred to as 'corpus'). A word's tf-idf represents the frequency of a term adjusted for how rarely it is used. The statistic tf-idf is intended to assess how important a word is to a subset of documents in a collection of documents or corpus.[26]

Lastly, latent Dirichlet allocation (LDA) was used for Topic modelling, which is a commonly used algorithm for topic modelling in text mining, aiming at discovering a given number of topics within a set of documents (=the so-called 'corpus').[26] An LDA algorithm automatically generates keywords per topic and their weight (or 'importance').[27] Keywords can correspond to more than one topic, but generally with different weights (the keyword will be more or less important in one topic compared with another). This is an advantage of topic modelling as opposed to 'hard clustering' methods: topics used in natural language could have some overlap in terms of words.[26] An essential step of the LDA algorithm is assigning each word in each article to a topic. As a consequence, each document is composed of multiple topics but typically only one of the topics is dominant.[27] The more words in a document are assigned to a particular topic, generally, the more weight (also called 'gamma probabilities') will go on that document-topic classification.[26] As such, it is possible to determine to which topic every document corresponds dominantly. LDA modelling was used in our study to identify meaningful topics within the complete set of included articles and subsequently allocate every article to one of the generated topics.

RESULTS

Electronic database searches identified 5277 titles and abstracts, with a further 7 identified through the grey literature search. After removal of duplicates, 3975 articles were screened by title and abstract, resulting in 569 potential articles to be included. After reviewing the full text of these articles, 282 unique studies were included in the systematic review. A flow chart regarding the inclusion of articles can be found as an additional file (online additional file 2).

Characteristics of included studies

Of all included studies, most studies were conducted in Africa (43%), followed by North America (23%), Asia (15%) and Europe (12%) (see table 1). The majority of studies collected data from women only (58%), while 20% collected data from both men and women and around 16% collected data from men only. Registry data were used in 6% of studies and mostly referred to hospital files indicating the presence of men during ANC. Terms used to assess the role of the male partner were: involvement, support, engagement, participation, attendance and presence. Most studies used a cross-sectional design (58%), followed by a longitudinal design (23%). Only

Table 1 Characteristics of the included studies

	n	%
Continent		
Africa	121	42.91
North America	66	23.40
South America	7	2.48
Europe	35	12.41
Asia	42	14.89
Australia	11	3.90
Data source		
Registry data	16	5.67
Survey men	45	15.96
Survey women	163	57.80
Survey both	55	19.50
Others	3	1.06
Terminology		
Involvement	140	49.64
Engagement	6	2.13
Participation	17	6.03
Attendance	6	2.13
Presence	6	2.13
Support	107	37.94
Study design		
Cross-sectional	164	58.16
Cohort/longitudinal	64	22.70
Quasi experimental	20	7.09
Experimental	16	5.67
Case control	4	1.42
Scale/questionnaire development	6	2.13
Clearly defined indicator		
Yes	257	91.13
No	25	8.87
Type of indicator		
Single	93	34.75
Multiple	182	63.48
Unclear	7	1.77
Indicators used		
ANC attendance	113	40.07
Financial support or transport	49	17.38
Presence at delivery	48	17.02
HIV testing	39	13.83
Psychosocial scale measurement (>10 items)	30	10.64
Communication about ANC	30	10.64
Feeling supported	24	8.51
Sharing household tasks	20	7.09
Involvement in decision making	18	6.38

Continued

Table 1 Continued

	n	%
Presence at postnatal care	16	5.67
Involvement in birth preparedness (not including transport/financial support)	16	5.67
Knowing partner's ANC appointment	15	5.32
Knowledge of danger signs	12	4.26
Condom use/communication about condom use	12	4.26
Officially registered as father	9	3.19
Topic		
Psychosocial health	90	31.91
Maternal and newborn health (not including PMTCT)	134	47.52
Abortion	8	2.84
Prevention mother to child transmission	50	17.73

ANC, antenatal care; PMTCT, prevention of mother to child transmission.

around 6% of the studies used a randomised controlled trial design. One in 10 studies did not give a clear definition of the indicator used for assessing MI (or one of the similar terms listed earlier). While 35% of studies used a single indicator for assessing MI, most studies (63%) used a combination of indicators for measuring MI. Two-fifths (40%) of studies used ANC attendance as one of their indicators for assessing MI and one in six studies used financial support or transport (17%) and presence during delivery (17%). Around 14% of studies used the indicator HIV testing. All indicators that were used to assess MI can be found in table 1. Core topics of the studies were PSH (32%), MNH (48%), PMTCT (18%) and abortion (3%). All categories within table 1 were mutually exclusive except for the used indicators.

Terminology used for describing the role of the male partner

Studies using the term 'male attendance', 'male participation' or 'male engagement' to describe the role of the male partner did not significantly differ from studies using the term 'MI' in the use of the most common indicators (ANC attendance, financial support or transport, presence at delivery, HIV testing, psychosocial scale measurement and communication about ANC). Results of the Fisher's exact test per indicator can be found in online additional file 3. We consider these terms as synonyms for the remaining results section.

Studies using 'male presence' to describe the role of the male partner always used presence at delivery as their only indicator and differed significantly (p=0.034) in the use of indicators from studies using the term MI.

Studies using the term 'male support' to describe the role of the male partner showed a significant difference (p<0.001) in the use of indicators compared with the term 'MI'. Studies referring to the role of the partner as 'partner support' used more often complex psychosocial scales (>10 items) such as the Tilburg Pregnancy Distress Scale[28] or Social Support Effectiveness Questionnaire.[29]

A comparison between the use of indicators for the terms using involvement/engagement/attendance or participation versus support with the respective confidence intervals can be found in figure 1. Studies using the term 'male presence' were excluded from this specific analysis because they always used presence at delivery as single indicator for MI, resulting in 276 included studies (n=276).

The use of different indicators for assessing the role of the male partner

Among all studies using the term MI/engagement/attendance or participation, a wide range of indicators was used, often assessed in different ways. We found studies aiming for an in-depth comprehensive assessment of MI through the use of extended surveys for both men and women, combining different indicators (≥3)

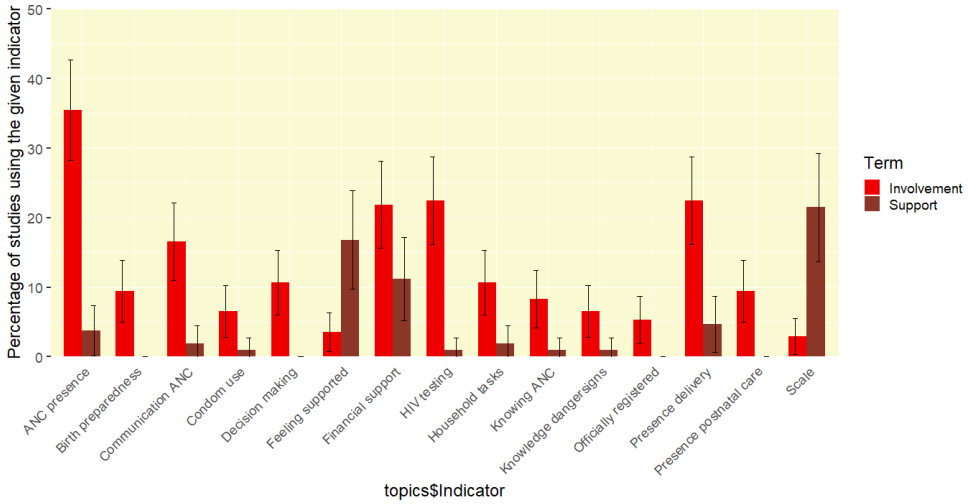

Figure 1 Use of indicators according to the term involvement (engagement/attendance/participation) versus support (n=276). ANC, antenatal care.

for assessing MI (n=26). These studies (see reference list in online additional file 4) were not limited to a certain region or topic, indicating researchers have tried to assess MI in a multidimensional way all over the world. Several authors refer to previously developed scales or indexes, such as the MI index of Byamugisha *et al*,[23] but almost all studies eventually create their own unique composite. We also found studies assessing MI very simply by using service registry data retrospectively and defining MI as having the father's name written on the birth certificate (n=7). In conclusion, no common set of indicators could be identified for measuring MI/engagement/attendance or participation.

ANC attendance as a single indicator (n=26) was common in studies in low-income countries (LICs), with majority of studies deriving from Africa, Asia and South America and only two studies from North America. On the other hand, presence at delivery was used as an indicator in all continents, suggesting it is a more 'universal' indicator. Financial support, which was used in all continents except in South America, was also used frequently globally as an MI indicator. HIV testing was a typical indicator in African countries and the use of psychosocial scales was more common in North American and European studies.

We were also able to identify some patterns when we examined which studies used less common indicators and why. Studies defining MI by having a father/partner registered on birth certificates (n=9) were most often conducted in North America (six out of nine studies), using big datasets and focusing on neonatal health outcomes. Studies focusing on knowledge of danger signs (n=12) were typically derived from LICs (11 out of 12 studies) and focused on maternal health outcomes (11 out of 12 studies). Studies using condom use (or communication about condom use) as an indicator of MI always derived from an African country and focused in the majority of cases on PMTCT (8 out of 12 studies).

The relationship between terminology, continent of the study and topic

A scatter plot showing the relationship between the continent of the study, the topic of the study and the terminology can be found figure 2. A significant difference was found in the term used in the study according to continent ($p<0.001$) and topic ($p<0.001$). Studies using the term 'support' were more often conducted in Europe, North America, Australia and Asia, while the term 'involvement' was most often used in Africa and South America. All continents had studies using both terms.

Looking at the main topic of the study (manually given during data extraction), we also found a significant difference according to continent ($p<0.001$). The topic 'PMTCT' was most prevalent in Africa while the topic 'PSH' was common for studies from Europe and Australia (see figure 2).

In line with the indicators used for measuring male support (which mostly used psychosocial scales), studies using the term 'support' also more often had as their main topic 'PSH' ($p<0.001$) (see figure 2).

Text mining: highly used words according to continent

Pairs of two consecutive words, referred to as 'bigrams', were examined by text mining using the tidypackage. The tf-idf statistic was calculated for the bigrams in the corpus. Subsequently the top 15 words were ranked per continent. The continents Australia and South America were deleted during the process because of their low number of articles, 11 and 7 respectively. In figure 3, the top 15 words per continent are represented in a word

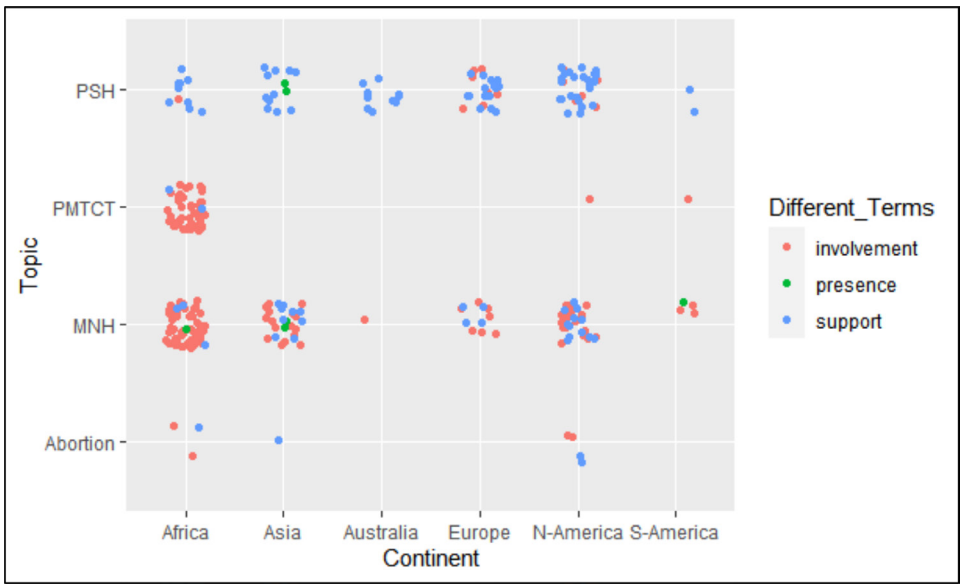

Figure 2 Jittered scatterplot showing the relationship between the manually classified topic, continent and terminology of the different studies included in the review (n=282). MNH, maternal and newborn health; PMTCT, prevention mother to child transmission; PSH, psychosocial health.

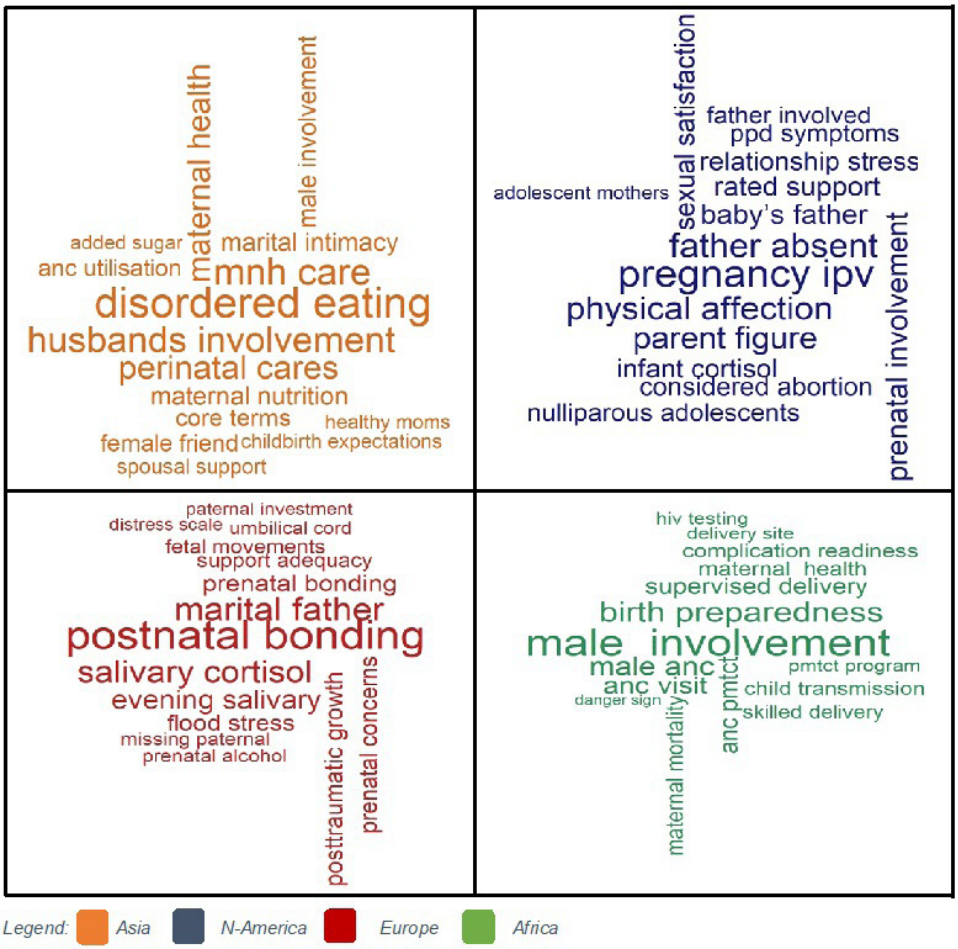

Figure 3 Word cloud visualising the top 15 bigrams per continent, based on their tf-idf value. tf-idf, term frequency-inverse document frequency.

cloud, with font size reflecting the tf-idf value, showing the different content of the articles according to continent. The word cloud shows that in Asia MI studies were characterised by a focus on nutrition (reflected by the words 'maternal nutrition', 'healthy moms', 'disordered eating' and 'added sugar'). In Africa, institutional delivery (reflected by the words 'skilled delivery', 'supervised delivery' and 'delivery site') seem important, as well as PMTCT and birth preparedness. In North America, the words 'relationship stress', 'intimate partner violence' (IPV) and 'postpartum depression' (PPD) show that the literature mainly focuses on PSH and the couple relationship. 'Abortion' and 'adolescents' were more prominent words in the literature in North America compared with other continents.

Latent topic allocation by text mining

Lastly, we conducted a latent Dirichlet topic allocation by setting k=2, to create a two-topic LDA model. A larger number of topics (ie, a larger k) resulted in an unclear pattern of words, which were difficult to interpret. Setting k=2 we could find two meaningful topics in the corpus. First the algorithm identified two topics (topic 0 and topic 1) in the corpus and subsequently we calculated the probability that a word corresponded to topic 0 and to topic 1 (the weights) and similarly the probability that a complete document (or article) belonged to topic 0 and topic 1.

Figure 4 is a grouped bar plot of the top 20 unique key words that are most common within each topic (with the respective word count on the left y-axis and weights on the right y-axis). Especially words with a high weight and low frequency tend to characterise the content of a topic. The top keywords clearly show the two different meanings of the two topics that were extracted from the articles. The most common words in topic 0 include 'HIV', 'PMTCT' and 'test', suggesting that this topic represents the topic of HIV prevention, but also more broadly ANC attendance (by words such as attendance, visit, clinic). The most meaningful words in topic 1 include 'depression', 'stress', 'psychological' and 'anxiety', which suggests it may represent studies around PSH. Furthermore topic 1 includes the word 'father', while topic 0 only includes the word 'male'. This might indicate that studies in the field of PSH have a longer follow-up and more often include the period after birth, when the male partner has become a father. Only unique words were included in the graph for clarity, top key words among both topics included 'women', 'pregnant', 'maternal' and 'child'.

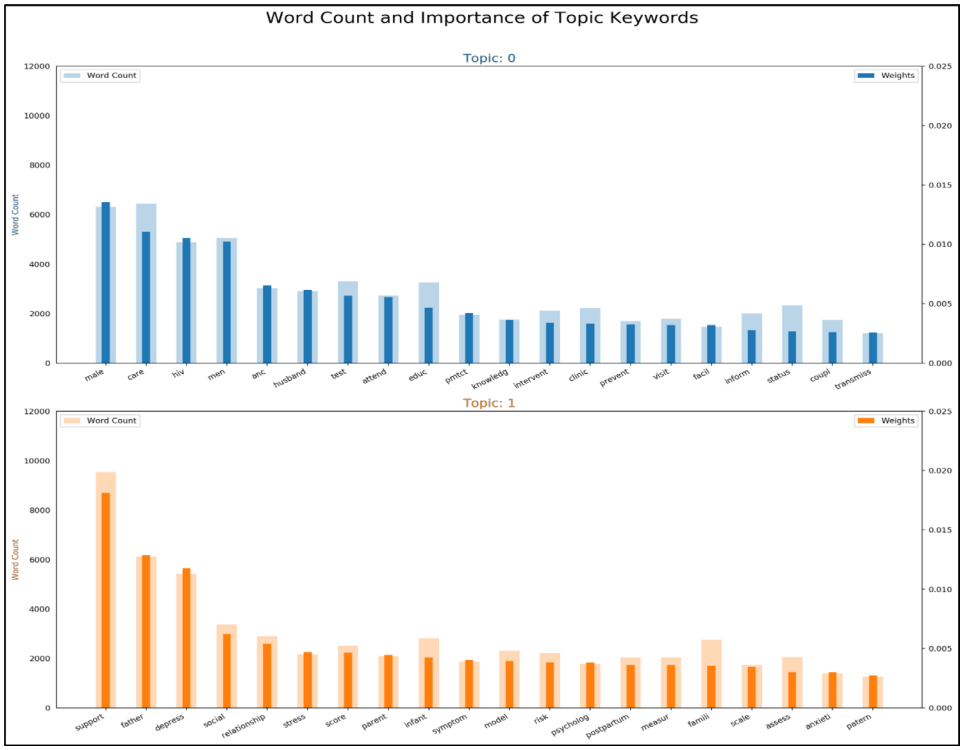

Figure 4 Grouped barplot visualising the top 20 unique keywords per topic with their respective weights and word counts.

The relationship between the computer-driven topic allocation, manually classified topics and continent of the studies

As a confirmatory analysis, we explored how well our unsupervised learning did at distinguishing the different topics in the documents. We would expect that studies that were manually given the topic PMTCT would be found to be mostly (or entirely) part of LDA topic 0 (HIV prevention and ANC attendance) and that studies given the topic 'PSH' would correspond to LDA topic 1 (PSH).

We visualised the relationship between the LDA Topics, manual topics, and continents by a scatter plot (see figure 5) and calculated the associations between LDA topics and manual topics with a cross-tabulation. The latter demonstrated that the topic PMTCT highly corresponds to LDA topic 0 (HIV prevention and ANC attendance), with 92% (46/50) of the PMTCT studies being classified as LDA topic 0. The topic PSH strongly corresponded to LDA topic 1 (PSH) with 92% (83/90) of the PSH studies classified as topic 1. For the topic 'abortion', we saw a higher correspondence with topic 1 (75%; 6/8) (PSH)

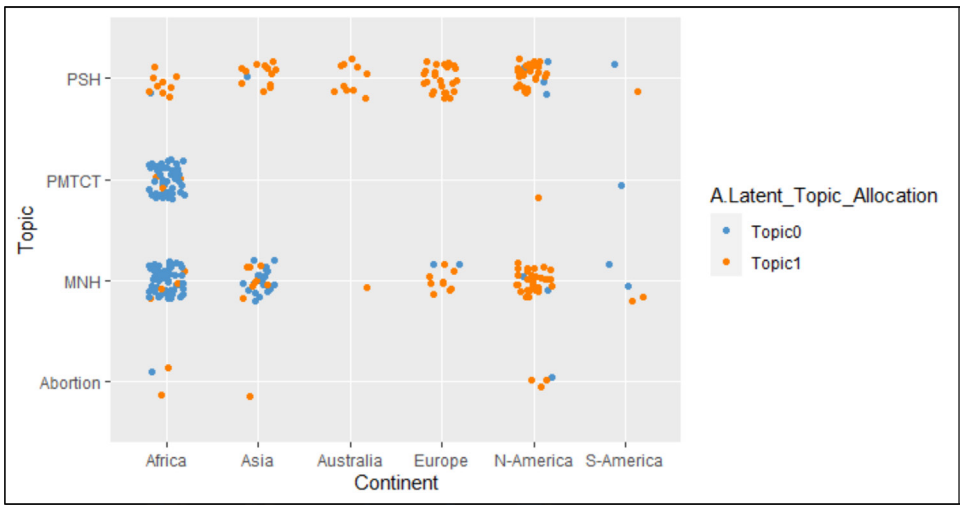

Figure 5 The relationship between the manual topics, LDA topics and continent of the included studies (n=282). LDA, latent Dirichlet allocation; MNH, maternal and newborn health; PMTCT, prevention mother to child transmission; PSH, psychosocial health.

and lower correspondence with topic 0 (25%; 2/8). The manual topic MNH seemed to correspond to LDA topic 0 (61%; 82/134) and 1 (39%;52/134). In the scatter plot (see figure 5), we noted a remarkable difference between LDA topic and manual topic correspondence according to continent, whereby MNH seem to correspond to topic 0 in Africa (HIV prevention and ANC attendance) but to topic 1 in North America (PSH). This indicates that while several studies in North America received the label 'MNH' during our manual data extraction, the natural language of studies in North America clearly differs from those conducted in Africa, resulting in another LDA topic (related to PSH).

DISCUSSION

The broad range of studies in the scientific literature examining and assessing MI have formed the evidence base for promoting MI as a promising strategy for improving MNH outcomes.[2 30 31] With this systematic review, we aimed to examine the conceptualisation of MI in maternal health in the quantitative literature of the last 20 years and critically review and discuss commonly used indicators. Both manual and computer-driven topic allocation showed us that studies in the field of MI in maternal health are mostly conducted to examine PSH on the one hand and maternal health care utilisation (especially ANC attendance, PMTCT services and institutional childbirth) on the other hand.

Despite the consensus that MI is a multifaceted concept, majority of studies seem to focus on only one particular aspect of the concept, resulting in a simplified measurement of MI in maternal health. The latter was illustrated by the high number of studies relying on a single indicator. Furthermore, there was no common set of indicators among studies using a combination of different indicators, almost every study had its own unique composite. Obviously, the measurement of MI depends on the context, but a critical reflection of the measurement is needed for a correct interpretation of the results. This is especially important as the lack of agreement in indicators leads to the risk that researchers only report the most significant variable. In some studies, included in the review, we found that MI was described and defined as a multidimensional concept in the introduction and methods but that in the results section only one indicator was used as 'the MI indicator'. As a consequence, results might be biased by selecting and reporting only the most significant indicator.

Almost half of the studies focused on presence at ANC or HIV testing and consequently the benefits for mothers and their newborns will mainly be oriented towards the prevention of HIV transmission. This coincides with the implementation of instrumental MI policies in several countries, aiming at improving male attendance at ANC by refusing to attend women without a partner present or giving priority to couples in the waiting line.[12 15 32 33] The negative side effects of introducing such policies for improving male attendance at ANC have started to emerge (such as increased gender inequality, stigmatisation of single women and lower ANC attendance of women[12 34]), nevertheless they have not led to the elimination of such programmes. This might be related to the strong influence of HIV programmes and donors, where programme success is defined by the proportion of men being tested during pregnancy.[35] In many communities, men attending antenatal healthcare services are perceived as being HIV positive,[36] because historically HIV counselling and testing was the main reason for inviting men in several African countries.[35] Future MI programmes should try to shift away from the focus on HIV testing and break the circle of stigmatisation that has been associated with these programmes.

Certain aspects of MI such as communication, decision making and 'feeling supported' were rarely included as MI indicators (10.64%, 8.51% and 6.38%, respectively) in the studies included in our review, while both quantitative and qualitative research have shown that these aspects of men's involvement play an important role in maternal health care access, utilisation and outcomes.[37–42] The narrow focus on specific actions of men (such as financial support and ANC attendance) without taking into other aspects (such as couple dynamics and gender equality) clearly entails a risk of missing essential information and underreporting negative consequences. The need for greater incorporation of gender-transformative conceptual approaches into MI interventions, with effective measures, was already emphasised by Comrie-Thomson *et al*.[13]Another recent systematic review reported that worldwide only a minority of the interventions aiming at engaging men and boys in sexual reproductive health and rights (SRHR) includes a gender transformative approach.[43] The authors warn that engaging men and boys in SRHR without explicit attention to gender inequalities can be harmful, particularly when it comes to undermining women's rights and autonomy. Within the field of MI in maternal health, a number of studies has shown that interventions could unintentionally lead to increased domination of decision-making about pregnancy, nutrition and infant care by men, putting pressure on women to adopt certain beliefs and practices.[4 44 45] Also subtle negative effects of MI programmes should be considered, in some cases male presence at ANC might negatively affect women's ability to speak openly and disclose sensitive issues such as IPV.[46 47] Only by aiming for a comprehensive assessment of MI programmes (collecting both quantitative and qualitative data) can these issues be identified and addressed in future MI interventions. More data regarding empowerment of women, gender equality and perceived support (from both men and women) can contribute to designing effective interventions with a gender transformative approach.[13 48] Especially investments in programmes that promote gender equality at an early age (among children, adolescents and young adults) can lead to a

lifetime of improved health and well-being,[49] including better maternal health outcomes.

Another interesting finding in our review was that the benefits of MI for the father himself are hardly explored and almost never assessed in interventions. Most studies did not collect data directly from men and even fewer studies assessed the potential benefits of MI for the father himself or mutual perceived support. Furthermore very little is known about men's specific needs during the transition to parenthood.[50 51] Father involvement is almost always used as an instrumental approach to improve maternal health, although the added value for the father himself (eg, the perceived health benefits by improving his own access to healthcare services) were already highlighted during the Cairo conference in 1995.[52] Emphasising the positive effect for the father himself and investing in his specific needs during the transition to parenthood could be explored as an intervention strategy,[53 54] whereby the health benefits might go beyond his participation in maternal health care services.

Looking at geographical context, several differences were noted by focusing on the most unique and common terms using text mining. In studies deriving from Asia words related to nutrition were more important, while in studies from North America words referring to IPV were more typical. In studies conducted in Europe, stress and depression were important terms, while in Africa ANC attendance and HIV prevention were important. Some of these differences can be explained by the different prevalence of certain problems (such as malnutrition in India[55] and HIV in Africa[56]), while other differences are less logical and probably influenced by funding bias and geographical sociocultural factors.

The proportion of studies about PSH and depression was lower in Africa compared with other continents. However, the literature indicates that perinatal depression is common in the African region.[57–60] Globally, perinatal depression is estimated to affect around 11% of women, and recent studies have shown that perinatal mental disorders are at least as prevalent in Africa as in other regions.[61–64] Furthermore, research has demonstrated that HIV positive women have increased risk of perinatal depression. A systematic review found a prevalence of 23.4% for antenatal depression and 22.5% for postnatal depression in HIV infected women.[65 66] The low number of studies on PSH in Africa in our review showed that the relationship between perinatal depression/PSH and the role of the male partner is poorly studied in Africa. While some have argued that many LICs have more pressing issues within maternal health than addressing perinatal depression (such as severe maternal morbidity and mortality),[2] other studies have shown there is reasonable evidence for the benefits and effectiveness of psychological interventions in low-income and middle-income countries (LMICs).[64 67] The low availability of mental health services in LMICs is one of the main challenges for addressing mental health problems, but some recent studies have shown that training and organising lay mental healthcare workers to address mental healthcare problems are a feasible and effective approach to combatting mental health disorders.[68] Furthermore MI and/or partner support has been shown to be a protective factor against perinatal depression globally.[6 69–71] More research into the field of MI and maternal mental health in LMICs could provide multiple health gains for the male partner, mother and child.

A very low number of studies in our review derived from South America compared with Africa, indicating MI in maternal health care seem understudied in that region. However, the limited literature emphasises that the current level of MI is extremely low in South America,[72 73] with strong gender norms being the most persistent barrier.[74–77] The reason why until now very few scientific studies have focused on MI in South America might be related to the lower prevalence of HIV on the continent compared with Africa.[56] Historically many MI programmes in maternal health in LMIC were implemented in order to improve the uptake of PMTCT, making it less useful (and less funded) in countries with low HIV prevalence. This also explains why the scientific literature on MI in South America is more often focused on attaining gender equality, instead of getting men to health facilities for HIV testing.[75 78]

Lastly but importantly, our review demonstrated that very few studies (n=8) focused on the role of the partner during abortion care. A recent systematic regarding gender transformative interventions for engaging men and boys in SRHR reported a similar gap in the evidence, with very little interventions focusing on engaging men in access to safe abortion care.[43] However, the important role of the partner in decision making and access to abortion services cannot be ignored.[79 80] A systematic review from 2016 showed that women contemplating abortion frequently involve their male partner in the decision and rely on him to help with logistics, finances and emotional support before and after the abortion; furthermore, MI was positively associated with women's well-being.[80] Despite his important role, young men's experiences of unintended pregnancy and their pregnancy decision making are hardly studied within the scientific literature,[81] although essential for offering adequate counselling and services for men and women regarding sexual and reproductive health. Given that 121 million unintended pregnancies occur each year with 61% ending in an abortion, more research regarding the role of the male partner in abortion care and pregnancy decisions is highly needed for improving not only maternal health, but also broader SRHR outcomes.[43 79 81] In conclusion, we believe the evidence base on MI in maternal health, and its related indicators, needs to be improved in the future in terms of regional representation, study robustness and a broader holistic scope.

Limitations

This review has certain limitations. We only included quantitative studies and used qualitative literature only

for interpretation of the results. By focusing only on quantitative literature and selecting the 'hard core indicators' we, as researchers, also conduct a reductionist analysis of MI, ignoring that certain instrumental actions might mean a lot for women and their partners in terms of involvement and support. A similar in-depth systematic review regarding the qualitative meaning of MI, comparing findings from different regions, would complement our findings. Furthermore, a broader review also including the role of the partner in planning a pregnancy (before conception) and/or family planning decisions could strengthen the existing evidence regarding MI in reproductive health.

Another bias in this study might be related to the principal investigator's (AG) background. A researcher's background and position often affects what they choose to investigate, the angle of investigation, the methods judged most adequate for this purpose, the findings considered most appropriate, and the framing and communication of conclusions.[82] AG has mainly conducted research in Mozambique, which might lead to a higher interest in the findings most relevant to this context (eg, the relationship between HIV programmes and MI). However, by involving coauthors in all stages of the research process we tried to minimise this bias. Finally, we restricted our search to a selected number of databases and only included English literature, which means certain studies will have been missed.

CONCLUSION

The concept of MI in maternal health is considered to be multifaceted within the literature but the assessment of the concept differs globally. We found two main streams of conceptualisation within the literature: a focus on psychosocial support on the on hand and focus on instrumental support for maternal health care utilisation (such as PMTCT services, ANC attendance and institutional childbirth) on the other hand. While both aspects are considered as core elements of male partner's (potential) role in maternal health, majority of studies seem to focus on only one of both aspects. In line with these findings the concept of in maternal health it is often measured by a simplified and narrow set of indicators and several essential elements such as communication between the couple regarding maternal health care issues, shared decision making, participation in household tasks and the subjective feeling of being supported by the male partner have received little attention. Until now, very few MI programmes seem to incorporate a gender-transformative approach with adequate measures. In addition, our review identified a gap in the literature regarding the role of the male partner in abortion decisions and access to abortion services. Further research, involving experts and pilot testing, is recommended to develop a robust set of valid and feasible indicators for assessing MI in maternal health globally in a more comprehensive way.

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Contributors AG conceptualised the study and lead the process of reviewing the literature. GP and TVS screened articles and contributed to data extraction. AG conducted all analysis under supervision of OD. All authors contributed to the development of the manuscript and read and approved the final version. The corresponding author attests that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted.

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Additional File 1: Search Strategy

##Concept maternal health in Mesh Terms

((("Maternal Health"[MESH] OR "Maternal Health Services"[MESH] OR "Pregnancy"[MESH] OR "Pregnancy Complications"[MESH] OR "Delivery, Obstetric"[MESH] OR "Hospitals, Maternity"[MESH] OR "Infectious Disease Transmission, Vertical"[MESH] OR "Breast feeding"[MESH] OR "Postpartum period"[MESH] OR "perinatal care"[MESH] OR "midwifery"[MESH] OR "mothers"[MESH] OR "infant, newborn"[MESH] OR "prenatal care"[MESH] OR "postnatal care"[MESH] OR "Reproductive Health Services"[MESH] OR "Maternal Welfare"[MESH] OR "Abortion, Induced"[Mesh])

##Concept maternal health in TIAB

OR (maternal[tiab] OR abortion[tiab] OR abortions[tiab] OR antenatal[tiab] OR babies[tiab] OR baby[tiab] OR birth[tiab] OR births[tiab] OR breast feeding[tiab] OR breastfeeding[tiab] OR childbearing[tiab] OR deliveries[tiab] OR delivery[tiab] OR gestation[tiab] OR gestational[tiab] OR health facilities[tiab] OR health facility[tiab] OR hospital[tiab] OR hospitals[tiab] OR "maternal Fetal infection transmission"[tiab] OR "maternal-fetal infection transmission"[tiab] OR midwife[tiab] OR midwifery[tiab] OR midwifes[tiab] OR midwive[tiab] OR midwives[tiab] OR miscarriage[tiab] OR miscarriages[tiab] OR mother[tiab] OR "Mother to child transmission"[tiab] OR "Mother to child transmissions"[tiab] OR mothers[tiab] OR neonate[tiab] OR neonates[tiab] OR newborn[tiab] OR newborns[tiab] OR obstetrical[tiab] OR obstetric[tiab] OR perinatal[tiab] OR post partum[tiab] OR postnatal[tiab] OR postpartum[tiab] OR pregnancies[tiab] OR pregnancy[tiab] OR pregnant[tiab] OR prenatal[tiab] OR puerperia[tiab] OR puerperium[tiab] OR "vertical pathogen transmission"[tiab] OR vertical transmissions[tiab] OR vertical transmission[tiab] OR reproductive[tiab] OR maternity[tiab] OR maternities[tiab]))

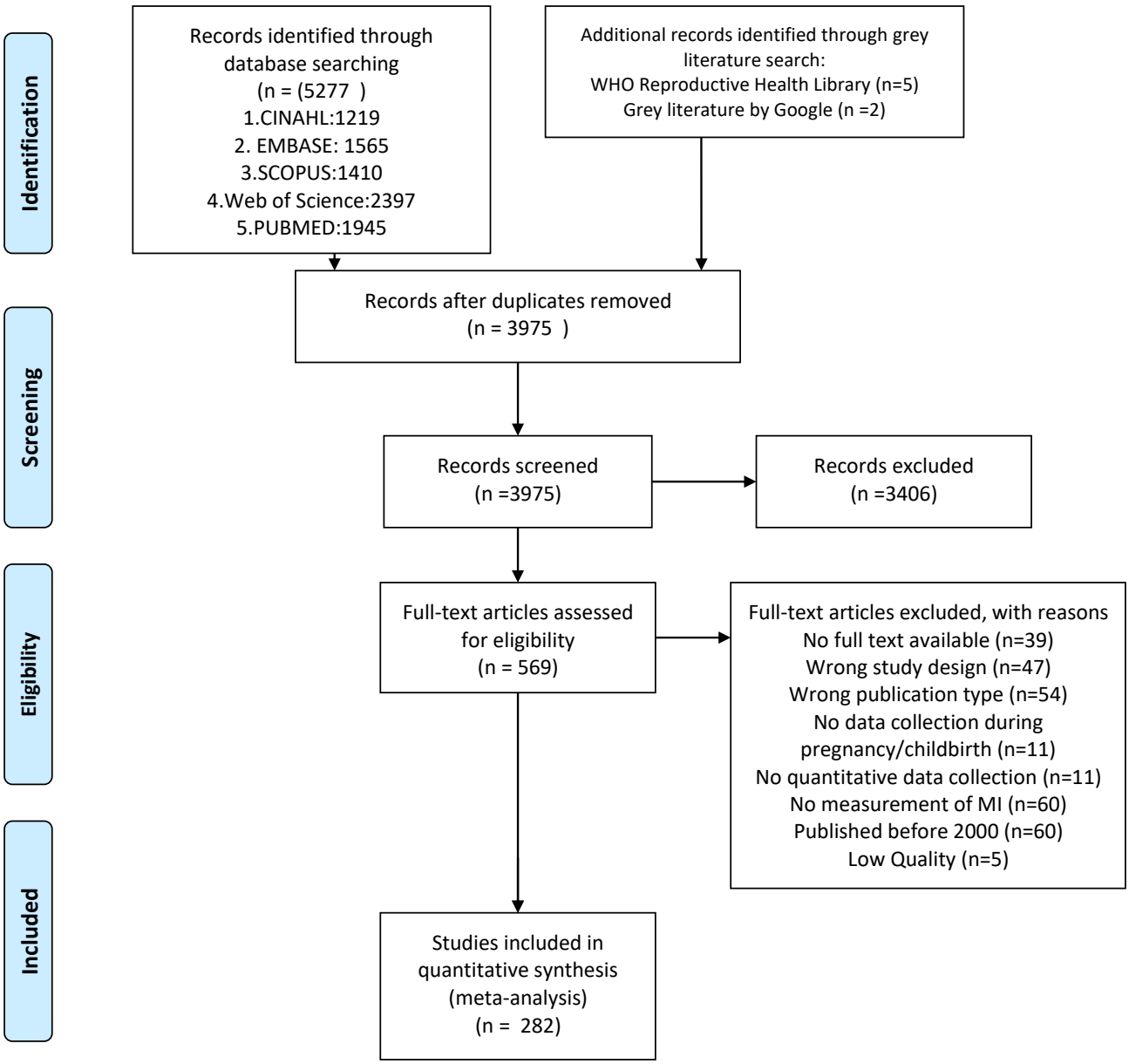
##Concept male involvement in TIAB

AND (men's involvement[tiab] OR men's participation[tiab] OR men's support[tiab] OR men's engagement[tiab] OR "partner involvement"[tiab] OR "partner participation"[tiab] OR "partner support"[tiab] OR "partner engagement"[tiab] OR "partners involvement"[tiab] OR "partners support"[tiab] OR "partner's involvement"[tiab] OR "partner's participation"[tiab] OR "partner's support"[tiab] OR "spouses support"[tiab] OR "father involvement"[tiab] OR "father participation"[tiab] OR "father support"[tiab] OR "father engagement"[tiab] OR "fathers involvement"[tiab] OR "fathers participation"[tiab] OR "fathers support"[tiab] OR "father's involvement"[tiab] OR "father's participation"[tiab] OR "father's support"[tiab] OR "father's engagement"[tiab] OR "husband involvement"[tiab] OR "husband participation"[tiab] OR "husband support"[tiab] OR "husbands involvement"[tiab] OR "husbands participation"[tiab] OR "husbands support"[tiab] OR "husband's involvement"[tiab] OR "husband's participation"[tiab] OR "husband's support"[tiab] OR "male involvement"[tiab] OR "male participation"[tiab] OR "male support"[tiab] OR "male engagement"[tiab] OR "males involvement"[tiab] OR "spousal involvement"[tiab] OR "spousal participation"[tiab] OR "spousal support"[tiab]))

##Humans only

NOT ("animals"[MeSH Terms] NOT "humans"[MeSH Terms])

Additional File 2: Prisma Flow chart[1]



[1]From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit www.prisma-statement.org.

Additional File 3: Results Fisher exact test

	Involvement				
	ANC attendance	Financial support or transport	Presence delivery	HIV testing	Psychosocial scale measurement (>10 items)
Participation	0.60	0.12	0.77	0.54	0.37
Engagement	0.41	0.16	0.62	0.61	0.16
Attendance	0.08	0.34	1	1	1
Presence	0.004	0.34	0.004	0.35	0.16
Support	<0.001	0.013	<0.001	<0.001	<0.001

Table 1 Results of the Fisher exact tests for assessing a difference in the use of indicators between studies using the term involvement, participation, engagement, attendance, presence and support.

Additional File 4: Reference list of studies with a multidimensional assessment of male involvement

Table 1 Overview of the studies using a multidimensional assessment (at least three indicators) of male involvement, based on data from men and women directly

ID	**title**	**First author name**	**year**	**country**	**design**	**topic**
6	Abortion risk and decisionmaking among young people in urban Cameroon.	Calves A.	2002	Cameroon	cross sectional studies	Abortion
22	Assessing Determinants of Father's Involvement with His partner's Pregnancy and His Child's Well-being: The Father Resources Survey Instrument	Cubbins C.	2018	US	Scale or Questionnaire development	PSH
25	Assessment of the level of male involvement in safe motherhood in southern Nigeria	Nwakwuo C. G.	2013	Nigeria	cross sectional studies	MNH
40	Child gender and father involvement in fragile families	Lundberg S.	2007	US	Cohort Studies	PSH
82	Explaining the Long Reach of Fathers' Prenatal Involvement on Later Paternal Engagement	Cabrera N.J.	2008	US	Cohort studies	PSH
89	Factors associated with male partner involvement in programs for the prevention of mother-to-child transmission of HIV in rural South Africa	Matseke M. G.	2017	South Africa	cross sectional studies	PMTCT
97	Father Early Engagement Behaviors and Infant Low Birth Weight	Lee S.J.	2018	US	Cohort studies	MNH
100	Father involvement, child health and maternal health behavior	Teitler J. O.	2001	US	cross sectional studies	MNH
101	Fathers' emotional involvement with the neonate Impact of the umbilical cord cutting experience	Brandão S.	2012	Portugal	Quasi experimental	PSH
116	Impact of male partner involvement on mother-to-child transmission of HIV and HIV-free survival among HIV-exposed infants in rural South Africa: Results from a two phase randomised controlled trial	Sifunda S.	2019	South-Africa	experimental	PMTCT
119	Improving PMTCT Uptake in Rural South Africa	Weiss S. M;	2014	South Africa	experimental	PMTCT
135	Knowledge, Perception and Level of Male Partner Involvement in Choice of Delivery Site among Couples at Coast Level Five Hospital, Mombasa County, Kenya	Onchong'a J.M.	2016	Kenya	cross sectional studies	MNH
137	Level of males' participation during perinatal period in rural areas of district layyah	Ishtiaq M.	2016	Pakistan	cross sectional studies	MNH

139	Male and female involvement in the birth and child-rearing process	Maroto-Navarro G.	2013	Spain	cross sectional studies	MNH
146	Male involvement in maternal healthcare as a determinant of utilisation of skilled birth attendants in kenya	Mangeni J. N.	2012	Kenya	cross sectional studies	MNH
166	Measuring parents' experiences and satisfaction with care during very preterm birth: a questionnaire development study	Sawyer A.	2014	UK	Scale	PSH
168	Men in maternal care evidence from India	Chattopadhyay R.	2012	India	cross sectional studies	MNH
208	Possible selves and prenatal father involvement	Adamsons K.	2013	US	cross sectional studies	MNH
247	Stress and anxiety in relation to amniocentesis do women who perceive their partners to be more involved in pregnancy feel less stressed and anxious	Brajenović-Milić B.	2010	Croatia	cross sectional studies	PSH
248	Suami SIAGA: male engagement in maternal health in Indonesia.	Kurniati A.	2017	Indonesia	cross sectional studies	MNH
260	The Effects of Father Involvement during Pregnancy on Receipt of Prenatal Care and Maternal Smoking	Martin L. T.	2007	US	Cohort Studies	MNH
277	What do women want? An analysis of preferences of women, involvement of men, and decision-making in maternal and newborn health care in rural Bangladesh	Rahman A. E.	2020	Bangladesh	cross sectional studies	MNH
105	Gender-transformative Bandebereho couples' intervention to promote male engagement in reproductive and maternal health and violence prevention in Rwanda: Findings from a randomized controlled trial.	Doyle K.	2018	Rwanda	Quasi experimental	MNH
101	Fathers' emotional involvement with the neonate Impact of the umbilical cord cutting experience	Brandão S.	2012	Portugal	cross sectional studies	MNH
134	Knowledge and involvement of husbands in maternal and newborn health in rural Bangladesh	Rahman A. E.	2018	Bangladesh	cross sectional studies	MNH
169	Men's Involvement in Safe Motherhood	Okechukwu E.	2007	Nigeria	cross sectional studies	MNH

5.2 What are the most relevant and evidence based indicators for measuring male involvement in maternal health from a global perspective

Towards a global framework for assessing male involvement in maternal health: results of an international Delphi study.

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Summary box

What is already known?

-The existing literature shows a consensus regarding the importance and benefits of involving men in maternal health (MH), but the indicators used for assessing male involvement (MI) in MH vary worldwide and are inconsistent.

-Qualitative research has shown that emotional, practical and physical support are key aspects of male involvement, but very few researchers have included all of these aspects within their assessment of male involvement.

What are the new findings?

-A team of global experts reached a consensus regarding the most valid indicators for a multidimensional assessment of MI in maternal health, forming the basis of a global male involvement framework.

-A global framework for assessing male involvement in maternal health was developed, consisting of five categories: involvement in communication, involvement in decision making, practical involvement, physical involvement and emotional involvement.

-Certain aspects of men's role in maternal health, such as HIV testing, knowledge of danger signs and official recognition of the child, were considered as important in male involvement research, although not essential elements of a global framework.

What do the new findings imply?

-The strong consensus reached in this study around a global framework for assessing MI in MH provides a platform for further optimisation of the proposed indicators (based on pilot testing in different countries) and an opportunity for improved monitoring and reporting of effectiveness of MI interventions at a global level.

-Further research is needed to explore how couple dynamics (such as shared decision making, women's empowerment and gender equality) can be assessed within male involvement interventions.

Towards a global framework for assessing male involvement in maternal health: results of an international Delphi study.

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Keywords: Delphi, Male Involvement, Maternal Health

Word count: 8076

ABSTRACT

Abstract

Purpose

Currently no standard instrument exists for assessing the concept of male involvement in maternal health, hampering comparison of results and interpretation of the literature. The aim of this study was to construct the key elements of a global multidimensional male involvement framework, based on the latest evidence and input of experts in the field.

Methods

For this purpose a Delphi study, including an international panel of 26 experts, was carried out. The study consisted of three rounds, with 92% of respondents completing all three surveys. Experts were asked to rate indicators within six categories in terms of validity, feasibility, sensitivity, specificity and context robustness. Furthermore, they were encouraged to clarify their rating with open text responses Indicators were excluded or adapted according to experts' feedback before inclusion. A 85% agreement was used as threshold for consensus.

Results

A general consensus was reached for a global framework for assessing male involvement in maternal health, consisting of five categories: involvement in communication, involvement in decision making, practical involvement, physical involvement and emotional involvement.

Conclusions

Using the male involvement framework as a tool to assess the concept of male involvement in maternal health at local, national, and international levels could allow improved assessment and comparison of study findings. Further research is needed for refining the indicators according to context and exploring how shared decision making, gender equality and women's empowerment can be assessed and facilitated within male involvement programs.

Strengths and limitations of this study

- A strength of the study is the translation of results into a novel and practical framework for assessing male involvement in maternal health.
- The balanced mix of quantitative and qualitative data in this Delphi study allowed nuanced results and a rich discussion.
- Pregnant women and their partners were not involved in the development of the framework, which is a limitation.
- Due to its novelty, the framework might need adaptations based on new insights and evidence in the future, which can be considered as a limitation.
- This Delphi study was conducted in a short and intense time spam to guarantee a high response rate, consequently the short time spam did not allow a real-time virtual or in-person meeting with the experts.

Abbreviations

ANC: Antenatal Care

CS: Consensus Score

CSS: Context Specificity Score

ICPD: International Conference on Population and Development

MH: Maternal Health

MI: Male Involvement

PNC: Postnatal Care

BACKGROUND

The important role of men in reproductive health received major global attention for the first time during the International Conference on Population and Development (ICPD) conference in 1994[1]. The language of the ICPD statement on men's role was progressive for that time, emphasizing the need for equity in gender relations, with a special focus on men's shared responsibility and active involvement to promote reproductive and sexual health. Signatories of the agreement believed that if men are involved in a wide range of reproductive health services in such a way that they are supported as equal partners and responsible parents, as well as clients in their own right, better outcomes in reproductive health outcomes (for themselves, mothers and newborns) can be expected[2]. Since ICPD, there has been an increase in male involvement research globally, mostly with the ultimate aim of improving maternal and newborn health outcomes. While the issue has been studied in all continents, a recent systematic review found that the research angle is often different according to the context [preprint version: [3]]. While most African research focuses on male involvement in the prevention of HIV transmission from mother to child, Western countries focus more on the role of the male partner in improving psychosocial health, while Asian countries have conducted more research with respect to men's role in preventing malnutrition in pregnant women and infants. Although the rationale for involving men in maternal health (MH) is different according to the context, male involvement (MI) in MH is considered as an important, but often overlooked, strategy for improving maternal and newborn health outcomes worldwide[4, 5].

The perceived benefits of involving men in maternal health have been described by several systematic reviews and studies[4, 6–9]. A systematic review by Yargawa et al. (2015) showed that male involvement has a beneficial impact on maternal health through reduced odds of maternal depression and improved utilisation of maternal health services, specifically by higher rates of skilled birth attendance and postnatal care[4]. Male involvement was also associated with decreased likelihood of childbirth complications, although the evidence was less strong[4]. Noteworthy is that male involvement was defined differently across the included studies, with some authors focusing on male participation in health care services (mostly antenatal care) and others on decision making and financial support[4]. A later review in 2018 supported the findings of Yargaywa et al. by showing that interventions to engage men were associated with improved antenatal care (ANC) attendance, skilled birth attendance, facility birth, postpartum care, birth and complications preparedness and maternal nutrition[8].

The literature shows consensus regarding the importance and benefits of involving men in maternal health, but the definitions of MI in MH vary worldwide and are inconsistent[3]. Some authors have defined MI as male presence at antenatal care and others as a combination of financial support, shared decision making and participation in maternal health care services[10–12]. The interventions to involve men also vary, ranging from inviting men for HIV testing during antenatal care by invitation letters to multicomponent community interventions addressing women's health and gender roles[11, 13, 14].

Criticism has grown regarding the use of single measures for assessing MI, because they often tend to focus on instrumental support (by focusing on a single act such as antenatal care attendance or HIV testing), which might be affected by several barriers and consequently not represent true involvement of men[15]. Several authors highlight that a multiple measure is more appropriate because this allows measurement of different aspects of male involvement, taking into account both emotional and instrumental support[16, 17]. Furthermore, qualitative research has shown that the core elements of MI are very similar worldwide, whereby emotional, practical and physical support are key aspects of male involvement[18–20], making it likely that a global measure would be useful and feasible. On the other hand, studies also show that male involvement is a context-specific concept, influenced by social and cultural norms, as well as health system factors and policies[4, 21, 22]. Consequently, any global measurement or framework for assessing MI in MH will be challenged by context specific factors and interests.

Based on our research experience regarding MI in MH and discussions with key stakeholders (including researchers, clinicians, women and their partners, and decision-makers), we concluded that there is a lack of an multidimensional male involvement index for use worldwide. While some indexes have been published, they seem to have been developed for specific time limited programs and not based on global evidence and/or input of experts[23–25]. Consequently, it is challenging to monitor the trends in MI publications, lessons learned, interventions and guidelines, which hampers sustainable inclusion of men in maternal health worldwide. While a globally standardised list of indicators could be too ambitious at this early stage, an initial exploratory study regarding an international male involvement framework could pave the path for a more validated measurement of male involvement in different programs worldwide. Furthermore, such an instrument could allow improved comparison of findings across different contexts and facilitate the setup of multi country studies. Based on the research gap regarding a common set of indicators for assessing male involvement in maternal health, as well as the concerns of researchers and experts worldwide, the present study aims to retrieve a list of the most validated and important indicators of male involvement globally.

METHODS

Delphi technique

The Delphi technique is a method that aids in structuring a group communication process and allows participants to deal with an intricate problem as a group [26–28]. The Delphi technique has numerous advantages including simplicity of implementation, enabling collection of opinions of a large array of participants with distinct expertise located in various geographical locations, while ensuring anonymity during the process [28, 29]. For the purpose of this study, a multidisciplinary panel of experts was identified and engaged in prioritizing and selecting indicators and overarching dimensions to measure MI in maternal health for global use. An indicator provides a measure of a concept, and is typically used in quantitative research. Within this study we focus on specific questions assessing male involvement in maternal health and consider each question as an indicator[30].

Literature review and initial list of indicators

The initial list of indicators with their respective dimensions was developed by analysing and interpreting the results of a systematic review examining indicators used in the last 20 years to assess male involvement in maternal health[31]. First, the most frequently used indicators were selected based on the review. Following that, the retrieved list of indicators was refined by examining the evidence base of each indicator, based on both quantitative and qualitative literature. Indicators reflecting male involvement that has been shown to contribute directly or indirectly to improved health outcomes for men, women or newborns, were included. A final list (see supplemental file 1: table 1) was compiled with background information regarding the use of the indicators. In the Delphi study we worked with a survey questionnaire for men regarding their involvement in maternal health during the transition to parenthood. It is important to note that the survey was only a prototype to assess the indicators. Ideally the survey should also be administered to women (see supplemental file 2, final survey for women and men) and could be complemented with other data (such as reports from health care providers or other community members) for triangulation.

Expert inclusion criteria, identification and recruitment

A mixture of purposive sampling and systematic sampling was used to identify and recruit experts for the survey. Experts were recruited using three different strategies:

1. A search strategy was entered in Web Of Science to select papers regarding male involvement in maternal health. The top 20 authors (based on the number of peer reviewed articles included in the search) were contacted to participate in the Delphi study.

2. Authors with two or more papers as first author included in the systematic review (unpublished data of the systematic review) were also included. This search strategy overlapped with the previous search strategy, resulting in 13 new authors that were approached for participation.

3. Finally, purposive sampling was conducted to include experts outside academia (mainly policymakers) by examining author lists of guidance documents on male involvement programs and reviewing the speakers list of male involvement conferences and webinars. This was complemented by sending out emails to personal contacts within the field of maternal health, requesting them to refer us to experts within the field of male involvement in maternal health. This strategy resulted in another 35 contacts.

Three additional experts were identified by snowball sampling, because some selected experts spontaneously referred us to their colleagues or personal contacts. In total 71 people received an invitation email.

The online survey was developed with Sogosurvey (www.sogosurvey.com). In October 2020, prior to data collection, the online survey was piloted by three senior researchers. Feedback from the pilot was

incorporated in the final version of the first survey. Data was collected from October 2020 to December 2020.

The objective of this Delphi study was to present results based on the consensus of the group[32]. A 85 percent agreement and no strong opposition in open text comments was defined as consensus. Maximum number of rounds was predefined at three rounds at the start of the study in order to inform potential participants about their required engagement beforehand. Participants could change their opinion based on other participants input. If 85% of experts agreed to exclude an indicator, the indicator was dropped. Three rounds deemed enough to reach consensus. The original list of indicators consisted of 21 items and 6 domains (see supplemental file 1: table 1), which was altered to 18 indicators and five domains after reaching consensus (see table 1).

Ethics

All participants were invited by email one month before the start of the study and interested participants were asked to respond positively by email. Each online survey started with an informed consent statement whereby participants had to indicate if they had understood the information and agreed to participate. The identity of each member was anonymous to other members of the panel and was known only to the principle investigator (AG). Ethical approval for this study was obtained from the Bioethics Committee of Ghent University (EC/2018/1319).

Patient and Public Involvement

No patient or public involvement took place in the design or conduct of this study.

First round – Assessing weaknesses and strengths of each indicator

All experts received the survey link by email together with detailed instructions and a video PowerPoint presentation explaining the development of the first round of the Delphi survey, including detailed information regarding the systematic review and selected indicators. Subsequently experts were asked to rate the indicators on a Likert scale (5 = high relevance, 4 = relevant, 3 = moderate relevance, 2 = low relevance, and 1 = not relevant) for validity, feasibility, sensitivity and specificity. For each category experts were also asked to provide comments by open text. Validity referred to whether there is adequate evidence that this indicator reflects male involvement and that information of the indicator is useful for improving overall health outcomes. Feasibility referred to wither the required information could be collected easily from an existing source with limited missing values or other difficulties (such as social desirability or lack of complete medical records). Sensitivity referred to an indicator's ability to identify a partner/man who is actually involved as "positive" by having also a positive (="yes") answer to that particular question. The specificity of an indicator referred to its ability to identify a man who is actually not involved as “negative” by a negative response (="no") to the question. Experts received these definitions several times as reminders throughout the survey. They were also encouraged to recommend any other indicators that they deemed relevant but that were missing during the first round.

Second round – Retrieving the most valid and feasible indicators

An average score for validity, feasibility, sensitivity and specificity scores (from the first round) was calculated for each indicator and a synthesis of the open text responses was made, which was shared with the experts in the second round. Furthermore, indicators were improved according to experts' feedback and new proposed indicators were added. Experts were asked to indicate whether they agreed or disagreed (being mutually exclusive) with the proposed indicators and to justify their decision in open text responses under each category.

Third round – Building consensus

Experts received feedback regarding the previous round, with an explanation that only indicators with a minimum consensus of 85 percent agreement were included in the final framework, indicators below 85% were deleted or adapted based on the feedback. The threshold of 85% before inclusion was based on previously published standards within Delphi studies[33]. Again, any adaptation or deletion of an indicator was explained by adding written information under the indicator. In this final round, experts were invited to make final open text comments on the selected indicators, including if they did not agree on certain retrieved indicators. Finally, they were also asked to propose which indicators were highly context-specific (being mutually exclusive, Yes or No) according to their expertise. This question was added because of a general comment or concern of the experts in the previous rounds regarding the context specificity of certain indicators.

Data analysis

A Delphi study is often considered a mixed method approach with quantitative and qualitative data collection, and in this Delphi study both quantitative and qualitative data were triangulated to arrive at final results and conclusions. After three rounds a high level of consensus was reached together with sufficient clarification of the different opinions and viewpoints[34, 35].

After the first round the validity, feasibility, sensitivity and specificity of indicators were calculated by taking the mean of all the expert' scores in percentage. For easier interpretation of results by experts in the second round, scores of the first round were presented by reporting in which quintiles the indicator was situated compared to others. For exploring contrasting views variability of the different scores was assessed by calculating the variance (see supplemental file 3). After the second round a consensus score (CS) was obtained, by calculating how many experts agreed to include the indicator in the list in percentage (eg 100% means all experts responded they would include the indicator). A scatterplot was used for visualising validity versus feasibility and sensitivity versus specificity. After the third round a context specificity score (CSS) was calculated for each indicator, by calculating how many experts rated the indicator as "highly context specific" in percentage (eg 100% means all experts responded that the indicator was highly context specific). Consensus scores and context specificity scores were visualised by a lollipop plot (variation of a barplot [36]). Consensus scores and context specificity ratings were retrieved in separate rounds, resulting in missing values in the visual for context specificity, because

certain indicators were adapted, deleted or added after round 2. Missing values for context specificity scores (for indicator b3, f1 and f2) were imputed by the mean.

Indicators were revised, taking into account all open text responses of experts (see later under "qualitative responses") and the rating scores. All statistical analysis and visualisations were conducted in excel and R.

Open text comments were first analysed rapidly for feedback to the participants by looking at common themes inductively per indicator. For the purpose of this final paper, themes across all indicators were compared and synthesised into broader concepts, linking the comments back to the six broad categories deductively (for example all concerns related to decision making as a measurement of male involvement).

RESULTS

Quantitative data

Sociodemographic characteristics of participants

Respondents were purposively chosen to represent very different demographic backgrounds. Respondents' countries of origin included the Netherlands, Tanzania, Cameroon, Spain, USA (6), Canada (2), Philippines, Niger, Sweden (2), Japan, Poland, Norway, Mozambique (2), Belgium, Australia, Italy, Nigeria and Norway. Most respondents were doing academic work (23), some clinical work (3), some policy work (2), and some specified they were working in health systems strengthening (2). Some of them (4) combined more than one of these activities. Thirty-eight percent of respondents (10) was male and 62 percent (16) was female. Twelve respondents had a medical background (9 medical doctors, 3 midwives/nurses), 2 had a background in sociology, 2 in psychology and 2 in anthropology and others (6) had a degree in biology, pharmacy, health economics or public health. Years of work experience ranged from 5 up to 42 years, with an average of 20 years.

Response rates

Thirty out of 71 email invitations were responded positively, of which 26 participants completed the first survey, resulting in a response rate of 37%. Of those, 25 participants also completed the second survey and 24 the final survey. The completion rate of the Delphi study was 92% (number of respondents filling in the first survey divided by the number of respondents filling in all three surveys expressed as a percentage).

Ratings

During the first round experts rated 23 indicators for validity, feasibility, sensitivity and specificity (see supplemental file 1; table 1). In Figure 1, scores for feasibility and validity are visualised. Rating scores ranged from 56% to 85% for validity and 64% to 84% for feasibility. Entering the ANC consultation (c2) and accompanying the partner to the facility for childbirth (c4) were considered to be particularly highly valid and feasible indicators. In Figure 2, scores for sensitivity and specificity are visualised. Rating scores ranged from 67% to 87% for sensitivity and 56% to 82% for specificity. The visual shows that

some indicators were rated extremely high on sensitivity and low on specificity (e.g. a1:Talking with the partner about ANC and e1:Acknowledging the child), while for other indicators sensitivity and specificity scores seem to go hand in hand (e.g. all indicators in the category “physical involvement”).

In round one, respondents could also indicate which category name they preferred for the different categories (c) and (f). For category (f), 73% preferred “physical” over “presential” and for category (c) 65% preferred “cognitive” over “intellectual”.

In round two, several indicators were reworded, adapted and added, resulting in a list of 21 indicators (see supplemental file 1; table 2). Experts were asked to indicate whether they agreed or disagreed with including the 21 proposed indicators, based on the received feedback from other participants. For three indicators that received low ratings and negative open text comments in the first round, experts were specifically asked if they agreed to exclude them from the list (see supplemental file 1; table 2; c3, and e1). Those three indicators received high scores for exclusion (92%, 88%, 92% of experts agreed to exclude) and as a consequence all three indicators were eliminated in the third round. Consensus scores for inclusion for all other indicators ranged from 56-100% (see Figure 3). Consensus for inclusion were highest for “a1. Talking about antenatal care with the partner during pregnancy” and “b6.Taking care of the baby” and lowest for “f1.Knowing the content of ANC“ and “c1.Accompanying to the entrance of the facility for ANC“.

In round three, a new list of 21 indicators was proposed, and experts rated them for context specificity, with scores ranging from 8-100%. Two indicators from the category “physical involvement” were rated as highly context specific, namely “c2.Participation in antenatal care” and “c5.Presence at childbirth”. In addition they gave final input by open text comments (see further). Based on the final open text comments the ultimate list of indicators was created (see table 1) and corresponding framework (see Figure 4).

Figure 1 Scatter plot for validity and feasibility scores in percentage in round 1 of the Delphi study

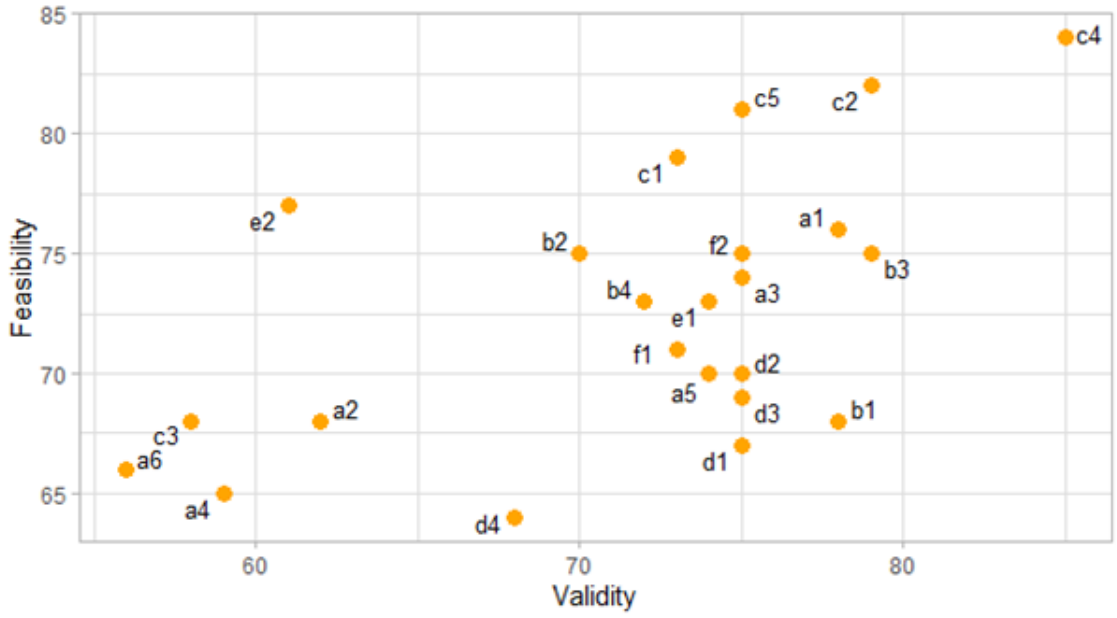


Figure 2 Scatter plot for sensitivity and specificity scores in percentage in round 1 of the Delphi study

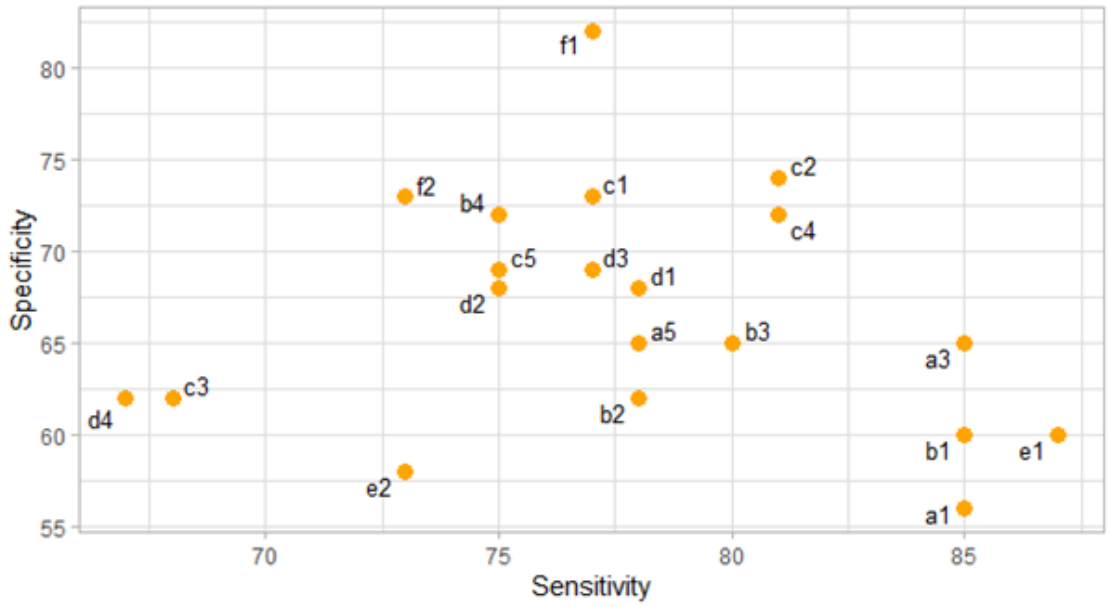
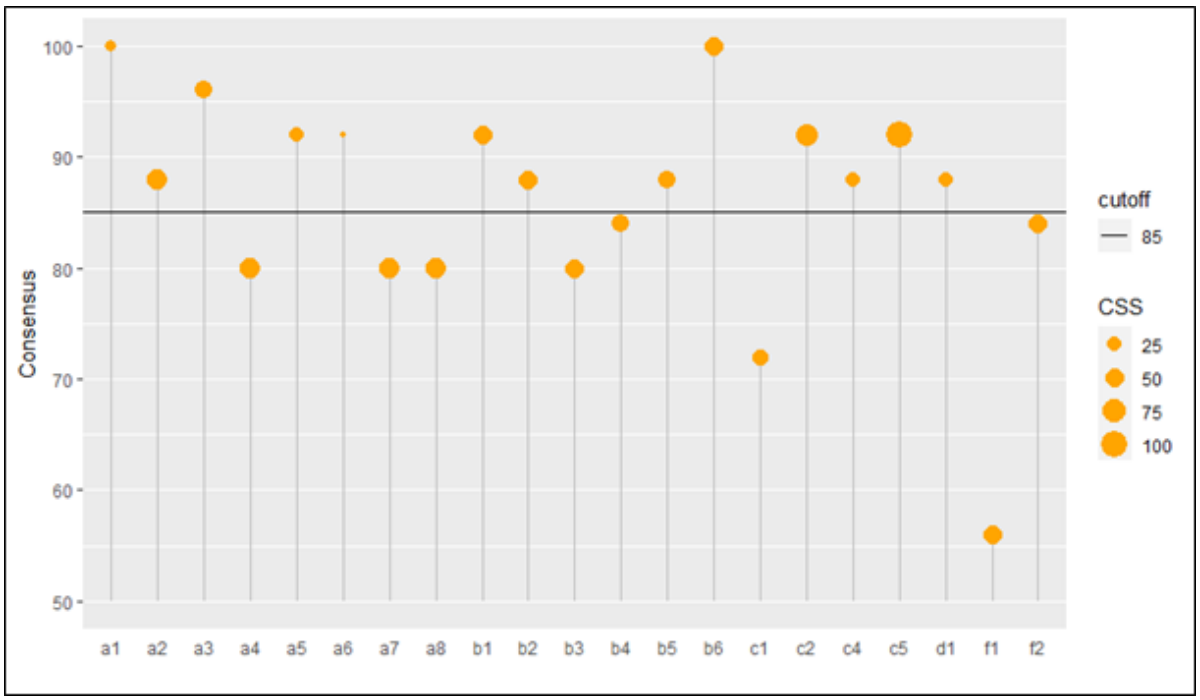
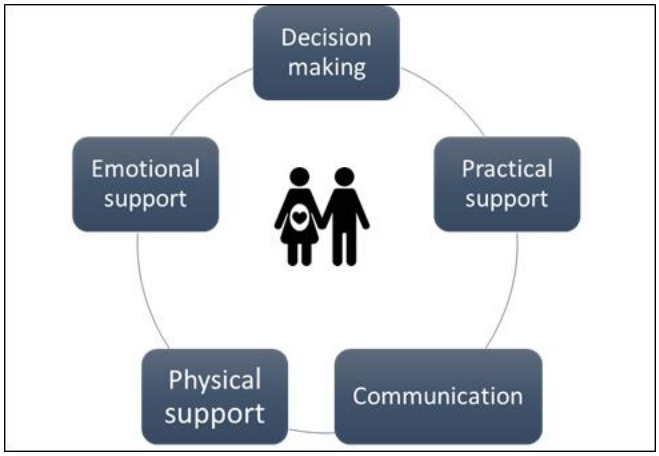


Figure 3 Consensus for the indicators of round 2 combined with context specificity scores (CSS) of round 3 in percentage



309 **Figure 4: Global framework for assessing male involvement in maternal health**



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313 **Table 1 Final list of indicators for assessing male involvement in maternal health - male version**

1. Involvement in Communication a. Did you talk with your partner about what happens during the antenatal care consultations (=care during pregnancy at the health care centre)? b. During the pregnancy, did you talk with your partner about the place of birth ? c. Did you talk with your partner about what happens during the postnatal care visit for women (a visit to the health center after giving birth for checking the mother)? d. Did you talk with your partner about what happens during the first newborn care visit (a visit to the health center after giving birth for checking the baby)?
2. Involvement in Decision making a. Did you take part in the decision whether or not to go for antenatal care? b. Did you take part in the decision about the place of birth? c. Did you take part in the decision whether or not to go to the postnatal care visit (for checking the woman after childbirth)? d. Did you take part in the decision whether or not to go for the first newborn care visit at the health care center?
3. Practical involvement a. Did you provide any type of financial support (including transportation) during the pregnancy (for reaching the health facility, buying medication,...)? b. Did you participate in doing household chores (such as washing clothes, cleaning the house, washing dishes, preparing meals…) during the pregnancy? c. Did you keep money aside during pregnancy for childbirth related expenses (such as baby clothes, medical fees, transport) ? d. Did you plan transportation to the nearest health facility in case of complications or emergencies during the pregnancy or period after birth? e. Did you participate in taking care of the baby (for example giving a bath, changing diapers, carrying the baby..) in the first weeks after delivery?
4. Physical involvement a. Did you accompany your partner to the health facility for antenatal care? b. Did you participate in the antenatal care consultation (=entering and receiving the information/care) ? c. Did you accompany your partner to the health facility for giving birth? d. Where you present during labour or childbirth as a birth companion? e. Did you participate in the first newborn care visit (first examination of the newborn at the facility, done within 6 weeks after childbirth)? **5. Emotional involvement** a. Overall, I feel I supported my partner emotionally during the pregnancy b. Overall, I feel I supported my partner emotionally during labour and childbirth c. Overall, I feel I supported my partner emotionally in the first weeks after childbirth

Qualitative data

Involvement in communication and decision making

Within the first category, indicators regarding communication were considered important with high scores on validity, feasibility and sensitivity. Specificity scores were lower, which was clarified by several experts in open text, explaining that "did you communicate with" is a vague expression, open to misinterpretation. In some cases couples might simply inform each other, while in others they might have an in-depth discussion, which would reflect varying levels of involvement. As noted by one of the respondents: "*One-way conversation or a direct order regarding attending or not attending antenatal care is not really communication although it could be interpreted as such*". No alternative indicator or "solution" was proposed for resolving this concern, besides rewording "communicate with" to "talking with", and exploring the aspect of communication through qualitative data.

Another concern raised by experts was the unstandardized provision of postnatal care (PNC), which might affect the validity and feasibility of certain indicators (see supplemental file 1, table 1, a5-a6). On the one hand experts argued that postnatal care is not offered globally (although it is recommended by the World Health Organisation[37]) and as a consequence male involvement indicators should not focus on this care component along the maternal and newborn healthcare continuum. On the other hand, several experts reasoned that PNC is too often neglected, and argued that inclusion of an assessment of male involvement regarding this aspect of care is important as part of efforts to focus more attention on PNC in maternal health care programs. Indicators regarding PNC were added based on the latter argument, but without focusing on male partner presence at the postnatal care. Based on the experts' comments and the absence of studies examining the potential benefits of involving partners in the postnatal care visit for women, it was decided male presence at PNC cannot be considered as an evidence based male involvement indicator at this time.

Experts had mixed opinions regarding the indicators about "decision making", with some supporting "shared decision making" as an indicator of male involvement, while others believed women should always be encouraged to take decisions autonomously. Consequently, some experts believed that "shared decision making" or a male partner making the decision might reflect male dominance rather than male involvement. Opinions varied regarding inclusion of decision making as an indicator and how to frame it. An alternative question of "whether the man participated in the decision" was proposed in the open text comments , which was further explored in the second round and generated more consensus. Because of the concerns regarding certain indicators assessing male dominance instead of male involvement , we added a note recommending collection of additional data regarding decision making (qualitative data) and gender equality (e.g. Promundo indicators[38, 39]) when using the male involvement framework in future research. This information was added to the final round and experts agreed with this approach. Another concern regarding the validity of the decision making questions in resource limited settings was that when institutional health care unavailable or very limited, these indicators might not reflect male involvement. As expressed by one participant "*this may not be much of*

a decision for many families". To reflect this, we added a note to the final list of indicators to recommend collection of additional data regarding sociodemographic characteristics of respondents to explore factors such as poverty, distance to the health facility and work-related barriers (such as partners working abroad or with strict working hours).

Lastly, the open text comments in the final round revealed that several experts considered this category as reflecting two distinct issues: communication and decision making. Therefore this category was divided into two separate categories in the final framework, one about communication and one about decision making (see Figure 4).

Practical involvement

Overall indicators within this category were evaluated positively, and were considered clear and straightforward, although some general concerns were raised. A general comment from most respondents was the high risk of social desirability bias within this category, especially in settings where a financial contribution is expected from the male partner. This was expressed as follows: *"Social desirability bias may have a substantial impact on results. This type of support typically aligns with men's established gender role (e.g. controlling household resources)".* Unfortunately, social desirability could be an issue for the majority of the indicators and it is not possible to completely avoid this kind of bias. Nevertheless, since the list of indicators is designed to be used for data collection among both men and women, this could help in revealing contradicting findings related to social desirability.

The other main experts' comments related to context specificity, which will need to be addressed in the future by slightly adapting the questions to the context and available resources (such as commonly available transport, the financial contribution that is expected during pregnancy/childbirth and health system factors). As recommended by the experts an indicator regarding participation of men in taking care of the baby was added (see supplemental file 1, table 2, b6), with high agreement among experts in the second round.

Physical involvement

In this category also, context specificity was a concern among several experts. It was felt that the indicators might not capture male involvement, especially in contexts where men are not allowed to be present during certain elements of maternity care (ANC, childbirth or PNC) or when cultural norms prohibit men from being present. This was explained as follows: "*Although I agreed with those indicators, it will be hard in most African cultures to have a man as birth companion."*

One specific indicator, HIV testing, received low scores on all domains (validity, feasibility, sensitivity and specificity) but also with high variance for validity, indicating low consensus (see supplemental file 3). Several experts argued this indicator is a reflection of the quality of antenatal care or PMTCT program success rather than male involvement: *"To me this indicates the health system (i.e. is couples VCT integrated with ANC) rather than men's involvement. In high-HIV prevalence settings, HIV counselling cannot really be measured separately from attendance at the first ANC visit (or at least one ANC visit)."* The majority of experts argued that the indicator does not distinguish involved from non-involved men.

This was illustrated by the following comment*: "A man may already know he has HIV and therefore may not get counselling. But this wouldn't suggest his attitude about the pregnancy."* Based on the comments and ratings, HIV testing was deleted as indicator within the list.

Because of previous research indicating that men, women, health providers and researchers themselves interpret male accompaniment at ANC differently (accompanying to the health centre versus actually entering the consultation room), we tried to capture this difference by developing two separate indicators for male ANC attendance (see supplemental file 1, table 1; c1.Did you accompany your wife to the entrance of the health facility for ANC & c2.Did you enter the ANC consultation room?). Experts agreed that both aspects are important and constitute involvement, but criticised the wording, in particular the term "entrance" was found to be confusing. The two indicators were reworded and improved throughout the rounds of the Delphi process to express the difference more clearly, based on the experts' input. In the final round no further concerns were raised.

The overall category was considered to be an essential part of the framework by a majority of the experts, as expressed by one participant in the last round: *"I consider all items as very relevant measuring male involvement whether in the rural periphery in low income countries or urban, or in the North. It is difficult to state the items are context specific in the rapid changing landscape of facility delivery attendance worldwide. There is a necessity for such an instrument to measure changes in behaviour over time in different contexts."*

Emotional involvement

For many experts this aspect of male involvement was seen as progressive and important, although they felt the indicators might be hard to be interpreted or understood, especially in contexts where psychosocial assessments are rarely carried out. Based on the comments, there was consensus regarding the importance of including a question about the subjective feeling of support, although the translation into the four proposed indicators was not unanimously appreciated. Some experts argued that capturing deeper emotional aspects (such as sharing feelings and joy) are not core elements of a male involvement list of indicators and are too culture-specific. One expert commented*: "In my opinion this measures emotional intimacy and emotional support within a couple (or coparent) relationship, which is closely related to, but distinct from, men's involvement."* The replacement of the four initial indicators (see supplemental file 1, table 1, d1-d4) by more general questions (see Figure 4, category emotional involvement) was positively evaluated and considered an improvement by most experts. The inclusion of other periods (childbirth and post-partum) within this category was suggested by the participants to align with the objective of the framework (which is to capture male involvement during pregnancy, childbirth and postpartum). Nevertheless, some experts perceived that the absence of indicators assessing mutual support (including support of the woman towards the male partner) and wider emotional aspects of support were a shortcoming of the final set of simplified indicators.

Legal involvement

Scores regarding legal involvement were rather low on all domains for both indicators but also with a high variance for validity and feasibility (see supplemental file 3). From the open text comments it was

clear that at least half of the respondents did not consider this to be an essential male involvement indicator, especially because the same men that recognise the child might not be involved (resulting in low specificity scores). Nevertheless, some experts also highlighted that legal acknowledgement affects women's sense of security and role in society, making it an important indicator. An expert raised the following argument for inclusion of the acknowledgement indicators: "*Voluntary establishment of legal paternity can be a proxy for both paternity confidence and male commitment to investing in the children, all of which reduces the anxiety of pregnant women and potentially improves maternal health outcomes*". However, a majority of the experts agreed that child acknowledgement and having the father's name on the birth certificate are not core indicators of male involvement, but that these variables are important to track in MI research, in similarity with other sociodemographic characteristics such as marital status and poverty level. In conclusion, acknowledgement of the child was concluded to be an inadequate measure of paternal investment and therefore deleted from the list.

Cognitive involvement

While a majority of experts found these indicators to be important, with limited variance among respondents (see supplemental file 3), several concerns were raised in open text responses. First, several experts agreed that male partners' knowledge of danger signs might depend on their ability to recall items, as well as literacy and access to information (e.g. information provided during ANC), rather than actual "involvement". One expert highlighted the following: "*It depends on their levels of understanding as well as literacy and commitment of health care providers. So I felt that these questions can measure only a small part of the involvement."* Furthermore, the calculation of what was considered as "good knowledge" for men, and as a consequence also "involved", was seen as invalid and over-simplified. This was expressed as follows: "*This is very didactic. What knowledge is most relevant and useful in a male partner?"*.

In conclusion it seemed that experts agreed that the assessment of knowledge of danger signs was important, but was not a reflection of being involved or not. In the final round of the Delphi survey, several experts indicated that, after reviewing the complete framework, they considered the last category as non-essential. One respondent explained this as follows: *"I don't see what these questions will add besides what is already known from the previous indicators."* Therefore, this category was eventually deleted, despite the importance attributed to knowledge of danger signs by many experts within male involvement research.

DISCUSSION

From consulting the literature and based on our own research experience, we noticed a knowledge gap within maternal health care research regarding valid and feasible indicators for assessing male involvement in maternal health. As a first step, a systematic review was conducted regarding the conceptualisation of MI in MH and most commonly used indicators[31]. The retrieved list of indicators from the systematic review then required a critical review from a global perspective for practical use in the future. Therefore, a Delphi study, involving experts from all continents, was the next step towards our goal of presenting a global framework for assessing male involvement in maternal health. Key

components of a Delphi process were followed, including anonymity, iteration, controlled acquisition of feedback, and analytic aggregation of responses [35]. Experts were encouraged to reflect upon a global male involvement framework, outside the scope of their own research activities to minimise bias. Round-to-round dropout rates were extremely low, which could be related to the targetted selection of participants (based on expertise and interest in the topic) and use of personal emails as reminders. The outcome of our study is a global male involvement framework with a list of indicators, open for improvements and adaptations. The main implications of the findings of this Delphi study will be discussed, taking into account the following aspects: 1) contrasting and unanimous views of experts, 2) practical use of the framework, 3) strengths and limitations and 4) further research.

Our initially proposed list of 23 evidence-based indicators was multidimensional (including 6 different dimensions or categories) and based on the most commonly used indicators within the literature from the last 20 years. Experts agreed on the importance and inclusion of most of the indicators within the dimensions, although almost all of the indicators were slightly adapted or reworded according to experts' input. The most contrasting viewpoints among experts were directed at the categories relating to decision making, acknowledgement of the child, and knowledge of danger signs as proxies for male involvement.

The first category, decision making, included questions regarding communication and shared decision making. Most research regarding the importance of communication and shared decision making within an assessment of male involvement derives from family planning studies. Several researchers have shown that improved communication about reproductive health can lead to shared decision making, which can in turn lead to improved access to family planning services [40, 41]. Redshaw et al. was one of the first researchers to include decision making during pregnancy within a male involvement assessment in 2013[42], while Ampt et al. was quite progressive by including both communication and decision making as essential elements of his index to measure MI in maternal and newborn health in 2015[23]. Both communication and shared decision making as male involvement measurements became much more common from 2015 onwards within the literature[43–45]. Today, the importance of assessing communication within male involvement research seems to be generally recognised, and there was also high agreement among experts in our study for the inclusion of indicators related to communication. The main drawback of using communication to assess involvement, noted by respondents within our study and other researchers [23], is the risk of assessing male dominance rather than involvement. In fact, this argument is also applicable to several other quantitative male involvement indicators. Triangulation of data (including in-depth qualitative research and reports from different sources such as men, women and health providers) could potentially distinguish male involvement from male dominance. In relation to the specific aspect of decision making, much less consensus exists regarding what is desirable within maternal health (shared decision making versus women making autonomous decisions), both in our study and in the literature. While certain more feminist groups have aimed to empower women to make their own decisions about reproductive health within maternal health care programs[46–48], other stakeholders emphasize that communication and

shared decision making with the partner leads to healthier relationships and better health outcomes[40, 49, 50]. The literature also reflects this troubled relationship between female empowerment and male involvement, with contradicting findings on whether the two concepts are positively correlated or not [51, 52]. In our list of indicators we included questions regarding the participation of men in decision-making, a measurement whereby supporting a woman in her decision can also be considered as participation and constitutes positive male involvement. Nevertheless, the decision making category is probably the most debatable part of the framework, leaving room for further improvements and follow up research.

Another category in our framework, acknowledgement of the child, also received divergent opinions from experts in the first round, although a final consensus regarding omitting the indicators was obtained by the end of the study. Acknowledgement of the child, or a proxy such as having the father's name on the birth files, has been used to assess the relationship between male involvement and neonatal health outcomes in several large cohort studies [53–55]. Notably those studies often relied retrospectively on large national or international datasets, whereby a more nuanced assessment of male involvement was not possible. Based on the experts' feedback, it became clear that whether or not a child is recognised by the male partner is an inadequate measurement of male involvement and adds little extra information to the other indicators of the list. In order to align with our goal of only including the most valid indicators, this category was eventually deleted from the framework.

The last category with conflicting experts' opinions concerned knowledge of ANC content and danger signs as measures of male involvement. The most important criticism was that the male partner's knowledge will depend mainly on the quality of ANC and his ability to recall items, rather than his actual involvement. Furthermore knowledge of danger signs is often low among men and women in general [56–58], suggesting that this has little to do with being involved or not. However, some experts considered knowledge of danger signs to be an essential aspect of male involvement, emphasizing that it may have a direct impact on maternal health outcomes. Within the literature we also observed different constructs: on the one hand a partner with good knowledge of danger signs was considered as being involved [59], while on the other hand the knowledge of danger signs and MI were seen as two different concepts, but often with a positive correlation [58, 60, 61]. While several studies have demonstrated the importance of knowledge of danger signs among women for complication preparedness [62, 63], the evidence regarding the added value of men's knowledge of danger signs in improving health outcomes, as well as what can be defined as 'good knowledge' for a male partner, is less clear. The category "knowledge of content of ANC and danger signs" was eventually deleted from the framework because of the lack of consensus both among the experts and within the literature, although it is an important aspect within maternal health that requires further research.

Our final male involvement framework and corresponding list of indicators are intended to be used for an assessment of men's involvement during pregnancy, childbirth and the post-partum period. All indicators were carefully selected based on experts' input and the evidence base, meaning that only aspects of male involvement that have been shown to contribute to improved health outcomes were included. While we incorporated indicators related to partners' presence during ANC and childbirth, we

did not include a similar indicator for assessing their presence during the postnatal care. Experts agreed to this approach within our study, because the added value for inviting men during postnatal care is not yet demonstrated in the literature, neither is it recommended by the World Health Organisation [4, 64–66]. On the other hand, indicators related to men's practical support and emotional support post-partum within the household were included, because those aspects of male involvement have shown to be beneficial for maternal and newborn health outcomes, especially for preventing post-partum depression [4, 67]. Nevertheless, postnatal care is organised differently in certain settings. One postnatal care visit can include family planning counselling, weighing of the newborn and a medical check-up of the woman as integrative approach (as recommended by WHO[68]) or care might be fragmented in different visits (eg women are seen by a gynaecologist and newborns by a neonatologist)[69]. As a consequence the proposed indicators might need to be specified according to different contexts. Overall we found a gap in the literature regarding male participation in postnatal care, which might need further investigation in the future.

The final indicators are presented here as a survey for the male partner, however it is highly recommended that male involvement studies also collect data from women, given the often contradicting findings between men and women[58] which require further investigation. A female version of the list of indicators was added in a supplemental file (see supplemental file 2) to facilitate data collection among both men and women . Furthermore, other sources such as reports from health care providers and medical registry data could be used to complement the indicators together with sociodemographic data for correct interpretation. Poverty, distance to the health facility and work-related restrictions (such as partners working abroad or with strict working hours) are all factors that might prevent men from being involved during pregnancy and childbirth, which can only be explored by collecting the necessary quantitative and qualitative data in addition to the list of indicators. Ideally the male involvement list of indicators and corresponding framework is used for data collection in the postpartum period, although also administration during other time periods is possible, with consideration of recall bias and/or adaptations of the questions. Furthermore, we recommend that scores are presented per category, rather than an overall "male involvement score", because the latter loses nuances and could be challenging to interpret. Finally, the experts' assessment of context specificity of the indicators taught us that while some indicators are likely to be very useful globally, others might need adaptations. We strongly recommend that researchers who intend to use the list of indicators and corresponding framework review each indicator, especially those with a high score on context specificity, and adapt them to the context, taking into account health system factors as well as cultural and social norms.

LIMITATIONS

The development of a global framework to measure male involvement in maternal health is quite novel and several aspects of this topic are still understudied within the literature. Consequently, the framework should be considered as a flexible tool rather than a rigid instrument, that might take different forms according to the context and newly available evidence. Another limitation is the rather short and intense timespan in which this Delphi study was conducted, which was chosen in order to guarantee a high

response rate. While the high response rate is a strength of this study, the short time span did not allow a long reflexion time for respondents, and also did not permit a real-time virtual or in-person meeting with the experts. The latter could offer more exchange of ideas and more nuanced views on the framework, but is also under debate within Delphi studies because of a lack of anonymity. In the aftermath of the COVID 19 pandemic, where many research activities were replaced by an online format, an evaluation study could explore the strengths and weaknesses of Delphi studies being conducted entirely online. Lastly, pregnant women and their partners were not involved in the development of the framework, which is a limitation. In light of the mentioned shortcomings, we would like to emphasize that the framework is open for improvements and adaptations, based on new insights and evidence in the future.

FURTHER RESEARCH

To our knowledge this is the first study proposing a global framework for male involvement in maternal health. The male involvement framework could be a first step towards more standardized evaluations of male involvement programs and may allow easier interpretation of evidence in different contexts. Nevertheless the framework and list of indicators need to be piloted and validated in different countries, together with an evaluation of the strengths and weaknesses of using the proposed indicators compared to previously-used male involvement assessments. Furthermore, men's role in family planning decision-making and uptake was not explored as a part of the framework, neither was men's role in access to abortion care. While both domains can be viewed as essential parts of maternal health care, they were considered to be beyond the scope of this study and would have required a broader and more in-depth analysis of the available evidence. The assessment of male involvement in these specific aspects of maternal health could be explored in follow up research. Pilot studies for evaluating and validating the framework are planned within our research group, but we also encourage other researchers to use, validate and disseminate this framework widely and to contact us for collaborations.

CONCLUSION

This study explored the opinions of experts from diverse backgrounds and regions on the validity and feasibility of a list of key indicators for measuring male involvement in maternal health globally, by using the Delphi method. A global multidimensional male involvement framework was constructed, based on the expert panel input and evidence from the literature. While we aimed for consensus in the indicator selection process, we also documented different views and perceptions among experts and within the literature. The proposed list of male involvement indicators and corresponding framework intend to capture the concept of male involvement in maternal health at local, national, and international levels, which we believe could allow improved assessment and comparison of study findings, eventually leading to better programming and health outcomes in maternal health.

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Contributorship

AG and ODG conceptualised the study and AG lead data collection and analysis. KR and NO gave input on the initial list of indicators and SG and ODG contributed to the development of the online survey. Interpretation of the data was done by AG with contributions of ODG, SG, NO and KR. AG drafted the final manuscript and ODG, SG, KR and NO gave input during writing. All authors read and approved the final version of the manuscript. The corresponding author attests that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted.

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Competing interests

None declared.

Data sharing

Data analysed during the current study will be made available from the corresponding author upon reasonable request.

Ethical approval

Ethical approval for this study was obtained from the Bioethics Committee of Ghent University (EC/2018/1319).

Dissemination to participants and related communities

The authors intend to disseminate this research through social media, press releases, and media departments and websites of authors' institutions.

Transparency

The guarantor affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

License for publication

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Supplemental File 1

S1: Table 1 Indicators first round

a) Decisive involvement

1. Did you communicate with your wife/partner about ANC during the pregnancy?
2. Who took the decision whether or not to go for ANC?
3. During the pregnancy, did you communicate with your wife/partner about place of delivery ?
4. Who took the decision about the place of delivery?
5. Did you communicate with your wife/partner about postnatal care visits?
6. Who took the decision whether or not to go to postnatal care visits?

b) Practical involvement

1. Did you provide financial support or transport during the pregnancy? (for reaching the health facility, buying medication,...)
2. Did you buy items for the baby?
3. Did you save money for the delivery or the baby?
4. Did you plan emergency transportation to the nearest health facility?

c) Physical/presential involvement:

1. Did you accompany your wife to the health facility for ANC?
2. Did you enter the ANC consultation room?
3. Did you receive HIV counselling during ANC?
4. Did you accompany your wife to the health facility for delivery?
5. Were you present in the room during delivery?

d) Emotional involvement :

1. I feel like my partner and I are enjoying the pregnancy together
2. The pregnancy has brought my partner and I closer together
3. I feel supported by my partner
4. I can really share my feelings with my partner

e) Legal involvement:

1. Did you acknowledge the child as yours?
2. Are you registered on the birth certificate?

f) Intellectual/cognitive involvement

1. Can you explain what happens during ANC ?
2. Which danger signs during pregnancy do you know

S1: Table 2 Indicators second round

a) Decisive involvement

1. Did you talk with your partner about ANC during the pregnancy (=care during pregnancy at the health center)?
2. Did you take part in the decision whether or not to go for antenatal care?
3. During the pregnancy, did you talk with your partner about the place of birth ?
4. Did you take part in the decision about the place of birth?
5. Did you talk with your partner about what happens during the postnatal care visit for women (a visit to the health center after giving birth for checking the mother)?
6. Did you take part in the decision whether or not to go to the postnatal care visit for women?
7. Did you talk with your partner about what happens during the first newborn care visit (a visit to the health center after giving birth for checking the baby)?
8. Did you take part in the decision whether or not to go the first newborn care visit?

b) Practical involvement

1. Did you provide any type of financial support (including transportation) during the pregnancy (for reaching the health facility, buying medication,...)?
2. Did you participate in doing household chores during the pregnancy?
3. Did you buy items for the baby?
4. Did you keep money aside during pregnancy for the upcoming baby?
5. Did you plan transportation to the nearest health facility in case of complications or emergencies during the pregnancy or period after birth?
6. Did you participate in taking care of the baby (for example giving a bath, changing diapers, carrying the baby..) in the first weeks after delivery?

c) Physical involvement:

1. Did you accompany your wife to the entrance of the health facility for ANC?
2. Did you enter the ANC consultation room?
3. Did you receive HIV counselling during ANC? => Delete
4. Did you accompany your wife to the health facility entrance for giving birth?
5. Where you present during labour or childbirth as a birth companion?

d) Emotional involvement

1. Overall, I feel I supported my partner in the first weeks after childbirth

e) Legal involvement

1. Delete category

f) Cognitive involvement

1. Can you explain what happens during ANC ?
2. Which danger signs during pregnancy do you know?

Supplemental file 2

S2: Table 1 Final list of male involvement indicators: male and female version

MALE VERSION	**FEMALE VERSION**
1. Involvement in Communication a. Did you talk with your partner about what happens during the antenatal care consultations (=care during pregnancy at the health care centre)? b. During the pregnancy, did you talk with your partner about the place of birth ? c. Did you talk with your partner about what happens during the postnatal care visit for women (a visit to the health center after giving birth for checking the mother)? d. Did you talk with your partner about what happens during the first newborn care visit (a visit to the health center after giving birth for checking the baby)?	**1. Involvement in Communication** a. Did you talk with your partner about what happens during the antenatal care consultations (=care during pregnancy at the health care centre)? b. During the pregnancy, did you talk with your partner about the place of birth ? c. Did you talk with your partner about what happens during the postnatal care visit for women (a visit to the health center after giving birth for checking the mother)? d. Did you talk with your partner about what happens during the first newborn care visit (a visit to the health center after giving birth for checking the baby)?
2. Involvement in Decision making a. Did you take part in the decision whether or not to go for antenatal care? b. Did you take part in the decision about the place of birth? c. Did you take part in the decision whether or not to go to the postnatal care visit (for checking the woman after childbirth)? d. Did you take part in the decision whether or not to go for the first newborn care visit at the health care center?	**2. Involvement in Decision making** a. Did your partner take part in the decision whether or not to go for antenatal care? b. Did your partner take part in the decision about the place of birth? c. Did your partner take part in the decision whether or not to go to the postnatal care visit (for checking the woman after childbirth)? d. Did your partner take part in the decision whether or not to go for the first newborn care visit at the health care center?

3. Practical involvement a. Did you provide any type of financial support (including transportation) during the pregnancy (for reaching the health facility, buying medication,...)? b. Did you participate in doing household chores (such as washing clothes, cleaning the house, washing dishes, preparing meals…) during the pregnancy? c. Did you keep money aside during pregnancy for childbirth related expenses (such as baby clothes, medical fees, transport) ? d. Did you plan transportation to the nearest health facility in case of complications or emergencies during the pregnancy or period after birth? e. Did you participate in taking care of the baby (for example giving a bath, changing diapers, carrying the baby..) in the first weeks after delivery?	**3. Practical involvement** a. Did your partner provide any type of financial support (including transportation) during the pregnancy (for reaching the health facility, buying medication,...)? b. Did your partner participate in doing household chores (such as washing clothes, cleaning the house, washing dishes, preparing meals…) during the pregnancy? c. Did your partner keep money aside during pregnancy for childbirth related expenses (such as baby clothes, medical fees, transport) ? d. Did your partner plan transportation to the nearest health facility in case of complications or emergencies during the pregnancy or period after birth? **e.** Did your partner participate in taking care of the baby (for example giving a bath, changing diapers, carrying the baby..) in the first weeks after delivery?
4. Physical involvement a. Did you accompany your partner to the health facility for antenatal care? b. Did you participate in the antenatal care consultation (=entering and receiving the information/care) ? c. Did you accompany your partner to the health facility for giving birth? d. Where you present during labour or childbirth as a birth companion? e. Did you participate in the first newborn care visit (first examination of the newborn at the facility, done within 6 weeks after childbirth)?	**4. Physical involvement** a. Did your partner accompany you to the health facility for antenatal care? b. Did your partner participate in the antenatal care consultation (=entering and receiving the information/care) ? c. Did your partner accompany you to the health facility for giving birth? d. Was your partner present during labour or childbirth as a birth companion? e. Did your partnr participate in the first newborn care visit (first examination of the newborn at the facility, done within 6 weeks after childbirth)?

5. Emotional involvement a. Overall, I feel I supported my partner emotionally during the pregnancy b. Overall, I feel I supported my partner emotionally during labour and childbirth c. Overall, I feel I supported my partner emotionally in the first weeks after childbirth	**5. Emotional involvement** a. Overall, I felt supported by my partner emotionally during the pregnancy b. Overall, I felt supported by my partner emotionally during labour and childbirth c. Overall, I felt supported by my partner emotionally in the first weeks after childbirth

Supplemental File 3

S3: Table 1 Average scores for validity, feasibility, sensitivity and specificity per indicator (scored on a Likert scale from 0-5) and the variance of the given ratings retrieved in round 1.

Indicators	Validity	Validity_Variance	Feasibility	Feasibility_Variance	Sensitivity	Sensitivity_Variance	Specificity	Specificity_Variance	
a1	3,884615	0,826154	3,807692	0,641538	4,230769	0,744615	2,807692	1,521538	
a2	3,076923	1,353846	3,423077	1,053846					
a3	3,769231	1,064615	3,692308	0,541538	4,230769	0,664615	3,269231	0,764615	
a4	2,961538	1,478462	3,230769	1,464615					
a5	3,692308	1,021538	3,5	0,58	3,884615	0,986154	3,269231	1,244615	
a6	2,807692	1,361538	3,307692	1,501538					
b1	3,923077	1,113846	3,423077	1,453846	4,269231	1,004615	3	1,52	
b2	3,5	1,38	3,769231	1,304615	3,923077	0,953846	3,115385	1,386154	
b3	3,961538	1,318462	3,730769	1,084615	4	0,88	3,269231	1,324615	
b4	3,615385	1,446154	3,653846	1,035385	3,730769	0,844615	3,576923	0,973846	
c1	3,653846	1,115385	3,961538	0,678462	3,846154	1,175385	3,653846	1,435385	
c2	3,961538	1,798462	4,115385	1,306154	4,038462	1,238462	3,692308	1,581538	
c3	2,884615	2,346154	3,384615	1,926154	3,384615	1,206154	3,115385	1,626154	
c4	4,269231	1,004615	4,192308	0,961538	4,038462	1,078462	3,576923	1,453846	
c5	3,769231	2,104615	4,038462	1,318462	3,730769	1,564615	3,461538	1,378462	
d1	3,730769	1,164615	3,346154	1,515385	3,923077	1,353846	3,384615	1,286154	
d2	3,730769	1,484615	3,5	1,46	3,730769	1,644615	3,423077	1,613846	
d3	3,769231	1,624615	3,461538	1,298462	3,846154	1,415385	3,461538	1,698462	
d4	3,384615	1,286154	3,192308	1,361538	3,346154	1,595385	3,115385	1,386154	
e1	3,692308	2,301538	3,653846	1,995385	4,346154	1,355385	3	1,84	
e2	3,038462	2,118462	3,846154	1,575385	3,653846	1,515385	2,923077	1,433846	
f1	3,653846	1,195385	3,538462	1,378462	3,846154	1,255385	4,076923	0,953846	
f2	3,769231	0,904615	3,769231	1,064615	3,653846	0,955385	3,653846	1,035385	

= Lowest Scores
= Highest Scores

Chapter 6

Discussion

6.1 General Discussion

In this section I will discuss overall findings of the thesis by making linkages between the results of the different studies, focusing on the main overarching conclusions and orienting the findings within the literature in the field. For a discussion of the specific findings of each study separately, I refer the reader to the discussion section of the articles in the previous chapters.

In part one of the general discussion the implementation of respectful maternity care (covering pregnancy and childbirth) for women and their partners will be explored. In light of these reflections, part two will first focus on the main barriers for an effective and sustainable involvement of men within maternal health and future directions for the implementation of successful male involvement programs. This will be followed by an in depth reflection of the causal pathway of male involvement interventions and improved maternal health outcomes. Lastly I will discuss how a more holistic approach and assessment within male involvement programs can lead to more evidence based policies and programming, minimising potential negative side-effects of male involvement programs.

PART I

Respectful maternity care during pregnancy: persistent challenges

Throughout the situation analysis of the current male involvement practices and barriers in southern Mozambique, several persistent challenges for the provision

of high quality antenatal care were observed. While I do not aim to discuss the overall quality of antenatal care in southern Mozambique in this thesis, I reflect on some findings related to respectful maternity care provision during pregnancy that are essential for framing the research findings about the role of men in maternal health care further on in the discussion.

Respectful maternity care is an essential component during the continuum of care that all women should get during pregnancy, childbirth, and the postpartum period [164]. Respectful care during this period needs to encompass basic human rights, including the rights to respect, dignity, confidentiality, information and informed consent; the right to the highest attainable standard of health, and freedom from discrimination and from all forms of ill-treatment[165]. RMC is sometimes also referred to as "person centred care" and falls under the building block "experience of care" of the WHO framework for the quality of maternal and newborn care, next to "provision of care" [166]. The conducted studies in southern Mozambique showed that the current provision of antenatal care does not comply with the recommended standards of RMC by the White Ribbon Alliance[165], neither the quality standards of WHO for a positive pregnancy experience [166].

First of all, privacy and confidentiality were found to be problematic in southern Mozambique due to overcrowded services and limited infrastructure, where women were often attended simultaneously in one room (Study 3 & 4). Secondly, adequate provision of information, informed consent and counselling were not guaranteed. HIV testing for example was routinely done at the first ANC, which is an evidence based practice [166], however the necessary information, informed consent, counselling and privacy was often lacking (Study 3 & 4). Furthermore knowledge of danger signs (study 4) was found to be equally low for women attending ANC and women not attending ANC, indicating adequate counselling of danger signs is not routinely done. Lastly also freedom from discrimination was problematic, with women accompanied by male partners given priority (Study 3). While companionship during ANC should be encouraged (as recommended by WHO [30, 167]) the current practice of giving priority to couples in Mozambique clearly fuels the discrimination of unaccompanied women. Especially already vulnerable groups such as single women and minors might be stigmatised even more by this practice [168, 169]. Importantly, this is not an officially written policy based on national guidelines, however it is a widely implemented practice according to our findings (Study 3 & 4). In conclusion inadequate privacy, inadequate space and inadequate counselling by health care providers in ANC were found to be serious bottlenecks that need to be addressed in southern Mozambique.

These findings are not new, in 2014 several studies already emphasized the need for more "person centred" care during pregnancy in Mozambique [170, 167], which

was followed by an intervention study to improve the implementation of a package of evidence-based services from the WHO ANC model in three regions [171]. The study showed that without intervention only 9.9% of women were screened for proteinuria and blood pressure measurement was done among 65% of women[172]. While the intervention had a positive impact on the overall quality of antenatal care services in the selected regions and was intended to serve as a model for the whole country [172], several challenges in antenatal care quality (both on the provision and the experience of care) still persist today. Recent studies in the region showed women are satisfied with the received care [173, 174] but that essential components such as malaria prophylaxis and discussion of danger signs are hardly done [174]. The quality of antenatal care services also impacts women's health seeking behaviour, another study in 2018 found that one in three women bypassed the nearest clinic for receiving antenatal care and travelled further, with their main motivation being receiving higher quality of care [175]. Not seldom, LMICs (including Mozambique) tend to focus more on the quantitative health outcomes related to coverage (such percentage of women receiving at least one ANC and being tested for HIV) than on the less tangible issue of quality improvement, shaping women's experiences [176, 177]. Just as in several other LMICs, it seems Mozambique has increased the number of women attending ANC tremendously over the last years, nevertheless this was not accompanied by similar gains in quality of antenatal care services [178, 179, 176, 180].

Respectful maternity care during childbirth: an urban-rural divide?

Labor and childbirth have been the components of maternal health care most studied with respect to RMC because the care provided around childbirth is considered as critical in terms of maternal health outcomes and a particularly vulnerable period for the occurrence of disrespect and abuse [181, 182]. In this thesis the prevalence of respectful maternity care during childbirth was assessed in two different settings in Mozambique (Study 1 & 2) together with exploring the role of the male partner during childbirth (Study 1, 2, 3). The definition of Bowser and Hill was used, defining the occurrence of D&A by 7 categories: physical abuse, non-consented care, non-confidential care, non-dignified care, discrimination, abandonment and detention in facilities[26]. Results showed that disrespectful treatment is prevalent in southern Mozambique, although low compared to reports from other countries [183, 184, 185], a finding that was confirmed by the work of Mocumbi et al. (2019) examining experience of care in southern Mozambique in different settings [186].

The different realities in the two included settings in the study regarding disrespectful treatment were striking, with the referral hospital reporting a prevalence

of 24% and the district hospitals a prevalence of 80 %.From other studies we know the risk factors for the occurrence of disrespectful treatment are multifactorial and complex; the relationship is often mediated by different factors such as the socio-economic status and educational level of women, mode of delivery, type of facility and the geographical region [187, 186]. The referral hospital in our study (Hospital Central de Maputo) is a unique setting, being a teaching hospital in the capital and last referral centre for the whole country. As a consequence the high number of highly qualified health personnel and supervision are probably the main reasons for the low prevalence of disrespectful treatment (Study 2). The lack of supervision in rural areas together with overstretched staff (Study 2) seems to be the most important triggers for the occurrence of disrespectful treatment, which can directly be linked to a lack of qualified human resources. Based on these findings and those of other studies [188, 189], I believe this difference in RMC and overall quality of care can be contextualised in an overall rural urban divide in terms of human resources and supplies allocated to maternal health services. While Maputo Province is much better resourced than the rest of the country in terms of maternity care, also within the province health facilities in the more rural areas tend to lack qualified health personnel[189]. On a national level Alba et al. demonstrated huge geographical inequalities in terms of access to care and the quality of the care received (with rural areas being the most disadvantaged) [190]. These findings are also reflected in the statistics of the national survey IMASIDA, showing worse figures for the majority of health outcome indicators in the centre and north of the country, characterised by a rural context [113]. In addition, midwives reported that women in Maputo City seem to expect higher standards of quality of care and will more easily put a complaint compared to women in rural areas (Study 2). The different level of power between women from urban and rural areas might be another factor contributing to the higher levels of disrespectful behaviour of midwives towards women in the district hospitals.

In our study (Study 3) nine percent of approached women refused an interview and especially in the district hospitals recruitment was more problematic and slower than anticipated. While interviewers emphasized their neutrality, a possible reason for non-participation could be the combination of a recent bad experience with hospital staff and the interview being conducted within the hospital walls (and fear of retaliation). Future studies regarding disrespect during labor and delivery at community level would be interesting to explore the validity of our results and rule out this type of non-participation, both urban and rural[191].

Several initiatives have been taken to address the high need for quality improvement in rural areas by Non-Governmental Organisations (NGOs) and the national government. United Nations International Children's Emergency Fund (UNICEF) and Associação Moçambicana de Obstetras e Ginecologistas (AMOG) for exam-

ple, have set up a mentoring programme for Mother and Child Health (MCH) services in Zambézia[192] and several national strategies emphasize the need for providing "health for all" [193]. Nevertheless health resources continue to be allocated inequitably, disadvantaging the more rural areas and more isolated regions in northern Mozambique. Tackling inequality within countries is included as a top public health priority in the global Sustainable Development Goals [194] and the above findings demonstrate Mozambique highly needs effective policies considering the rural-urban divide in improving maternal health and more effective interventions outside the capital.

Respectful maternity care: the importance of companionship

Another factor that seems to play an important role in experiencing disrespect during maternity care in southern Mozambique is the protective effect of birth companions (study 1 & study 2). Midwives reported birth companions can prevent disrespectful treatment by acting as "witnesses of care" and reduce neglect by their continuous support and attention. The right to birth companionship has been endorsed by the Ministry of Health in Mozambique under the initiative "maternidade modelo" [195] in 2014, which seems widely implemented in southern Mozambique according to our findings and another study in the region[186]. Birth companionship was denied to only 0.3% of women in the central hospital and 7.8% of women in the district hospitals; which are positive findings compared to the findings of studies in other LMICs. In a recent multicountry study in Ghana, Guinea, Nigeria and Myanmar only 50% of women reported the presence of a birth companion [52] and in the neighbouring country Tanzania only 12% of women reported to be accompanied during childbirth [196].

While majority of women had a companion in southern Mozambique, very little is known about women's and men's preferences regarding birth companionship and if these preferences are actually respected. Qualitative data showed men were willing to be involved and present during childbirth, but were obliged to wait outside the facility (Study 3). Also majority of women indicated they would like to be accompanied by their male partner, but that currently only female birth companions are allowed in almost all health facilities in Mozambique (Study 1).

A higher percentage of women in the central hospital were in favour of inviting their partners compared to women in the district hospitals (79% versus 63%). Again the geographical context might play an important role: in the urban context of Maputo city both public and private hospitals co-exist (with health care providers often combining a job in both sectors [189]) which seems to influence the expectations and demands of women delivering in the public hospitals (Study 2). The male partner is mostly allowed in the private hospitals as birth companion,

and midwives referred to this as a "good practice" . Lack of space and privacy was cited as the major reason why male birth companions could not be present in the public facilities, although also providers' attitude might play a role as our findings showed some midwives were also sceptical about the idea of allowing male birth companions (Study 2 & Study 3) .

Looking at the perceived benefits of allowing male partners as birth companions from other countries, a recent Cochrane review found that men who were labour companions felt that their presence made a positive impact on both themselves and on the relationship with their partner and baby [182]. Another review, relying on evidence from Bangladesh and Nepal, found that the presence of male partners in the delivery room had a positive impact on women's feeling of being in control during childbirth, and that male accompaniment during childbirth was positively linked to having an institutional delivery[197, 198, 54]. I believe also in Mozambique male companionship might create additional benefits for the couple and newborn, nevertheless an in depth evaluation and piloting phase in different contexts of such policy will be needed, taken into consideration the limited evidence from LMICs[182]. In addition persistent barriers (being the lack of privacy and confidentiality due to infrastructure together with shortage of trained providers) will need to be addressed before involving male partners during childbirth in southern Mozambique (Study 2 & Study 3).

It is important to note that ideally birth companions are already involved during antenatal care, explained by the intrapartum guidelines of WHO as follows: "Integration of the lay companion (including male partners/husbands, female relatives or friends) into antenatal care visits, childbirth education classes, etc., might empower companions with knowledge about the process of labour, familiarity with the health care facility structure, and the skills and confidence to better support the woman" [21]. Nevertheless this is not a current practice in Mozambique today. Majority of women came alone to ANC , a minority came with the male partner and women bringing a female friend or relative were an exception (Study 3 & Study 4). Also in the context of ANC the current quality standards (with lack of privacy and trained providers) seem major barriers for involvement of birth companions during ANC and it does not seem realistic to expect that birth companions can be empowered with all those skills and knowledge during regular ANC.

Not surprisingly, several persistent challenges in adhering to the standards of RMC (such as privacy, adequate infrastructure and well trained providers) in Mozambique also serve as barriers for involving men in maternal health (more specifically for the presence of men during ANC and for having male partners as birth companions). This brings us to PART II of the discussion regarding barriers for the involvement of men in Mozambique.

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PART II

Male involvement in maternal health: demand-side or supply-side barriers?

Several studies, both qualitative and quantitative, have shown that cultural barriers, together with gender norms and work related barriers play an important role in men's participation in maternal health care programs in Sub-Saharan Africa[199, 73, 144, 200, 201, 202, 203, 45, 58]. The most persistent barrier for men to be involved in antenatal care and broader pregnancy issues in the literature seems related to the norm that "pregnancy and childbirth are the women's domain" [57, 204, 205]. The latter seemed not a major barrier in southern Mozambique according to our findings, although other community norms were found to be hindering men's involvement, more specifically the idea that men accompanying their women are weak or HIV positive (Study 4). This is linked to the fear of being tested for HIV during ANC and accompanied stigma among men, which is a well-known problem in Mozambique. Historically most male involvement programs have been implemented as part of a broader PMTCT strategy [206, 207, 139, 208], which has created the association of male involvement with being HIV positive in the community. The findings regarding barriers for male involvement in maternal health in southern Mozambique were contradictory to the literature to a certain extent, because inherently men and women were in favour of more male involvement in maternal health (during pregnancy and childbirth) (study 1 & study 3) and that within the community they are expected to "take care" of the family. Furthermore work related barriers seemed to be negligible (Study 4). Men often accompanied their partner to the facilities for both pregnancy and childbirth (although waited outside at the gate), provided financial support and were involved in the decisions (Study 3& 4). While also some other studies within male involvement research reported these positive views of men and women in the community regarding male involvement in maternal health[209, 210, 55], most researchers emphasized a lack of interest from the men's side as major barrier[211, 212, 205].

Until now, most programs and policies in LMICs have tried to overcome barriers towards male involvement in maternal health by different intervention strategies, ranging from single interventions to broader multicomponent interventions[213, 48, 214, 208]. The most known and successful ones for increasing male attendance at ANC have been the priority rule for couples (for reducing the waiting time for men that might need to go to work) and invitation cards, together with community campaigns about the importance of male involvement in birth preparedness[215, 216, 217, 218, 82]. All these interventions are mainly oriented at intervening at the "demand side" of male involvement in maternal health, or in other words, guaranteeing more men are willing to be involved and overcome their perceived

barriers (mostly related to working hours and community norms).

I believe that in the Mozambican context especially supply side barriers (meaning the lack of high quality male friendly services during pregnancy and childbirth) are underestimated and under addressed in the current male involvement policies and programs. Health providers were not adequately trained to counsel couples during ANC (reflected by neglecting women's needs during the consultation and only directing information to the partner) and restrictive policies made it impossible for men to be present during labour, childbirth and the first hours postpartum (study 1, 2, 3, 4). Furthermore ANC services were already overcrowded and lacked the necessary space to guarantee privacy. As a consequence the benefits of men attending ANC were rather limited because of suboptimal care services. As an illustration, men attending ANC in our study were not better informed about danger signs than those who did not attend ANC, showing that a unique opportunity to inform and engage men in this aspect of pregnancy and childbirth is missed. In conclusion I believe that the engagement of men in maternal health in southern Mozambique often stops at the health facility gate because of the organisation of services rather than men not willing to be involved.

Maternal health care for three entities: the woman, male partner and couple

The evidence base related to the benefits of involving men in maternal health is built on the evaluation of interventions often including an adaptation of regular ANC services by introducing counselling sessions for couples, antenatal couple educational classes and outreach activities[206, 54]. Unfortunately, these adaptations of usual ANC into "male friendly ANC services" are often neglected and not widely implemented in LMICs. The discrepancy between the evidence based guidelines and actual implementation might explain why majority of men is still hardly participating in maternal health care services in most LMICs.[219]. Also the Mozambican government has published clear guidelines on the involvement of men in maternal health care in 2018[220], that are only partially implemented. Notably, those guidelines have been developed by PEPFAR (=The U.S. President's Emergency Plan for AIDS Relief) with all indicators focusing on PMTCT (eg % men tested for HIV, % of HIV positive women adhering to antiretroviral therapy) without including other assessments of male involvement.

Results (Study 3 & study 4) showed that men in southern Mozambique are often invited into ANC (with or without the use of invitation cards) and that those attending ANC services are tested for HIV, but that no other efforts have been done to make services "male friendly" or involve men outside ANC. A realist review of male involvement in ANC services of 2020 [219], emphasized that engaging men in ANC is most likely to be successful when services are male friendly and when cou-

ples have monogamous trustful relationships. Unfortunately those circumstances do not correspond to the reality in most LMICs. Nevertheless, even small changes to the provision of care might increase men's willingness to be involved and increase success rates of male involvement strategies. Potential "realist" adaptations are: changing the language from women's clinic to family clinic, making the invitation of men routine (and not only for HIV positive women for example), and adapt the waiting and consultation room to have more privacy and space[219].

I want to add to these recommendations that another essential component for coming to more successful male involvement programs will be the training of health care providers. From the findings of Study 3 and other studies we know health care providers are still reluctant to invite men because it might double their work and they do not always feel capable of counselling both men and women during ANC[70, 200, 221]. Health providers need to be trained and prepared to deal with both the woman, man and the "couple" during ANC. While the different needs of men and women during pregnancy have received attention in the literature[222, 223], I would like to emphasize the existence of a third entity, being the couple relationship. I add the aspect of "the couple relationship" because the dynamics between the couple and prevailing gender norms will shape how men can be optimally involved without compromising women's autonomy. The findings of Study 3 showed that in strong patriarchal societies women might lose their safe space during ANC when men are present. Both health providers and service users reported a phenomenon whereby women "close up" because their male partner is present(Study 3). Sometimes health providers reinforce these dynamics by only talking to the partner, out of respect. Health providers should be fully aware of their important role to not reinforce gender inequality but promote healthy gender equitable relationships.

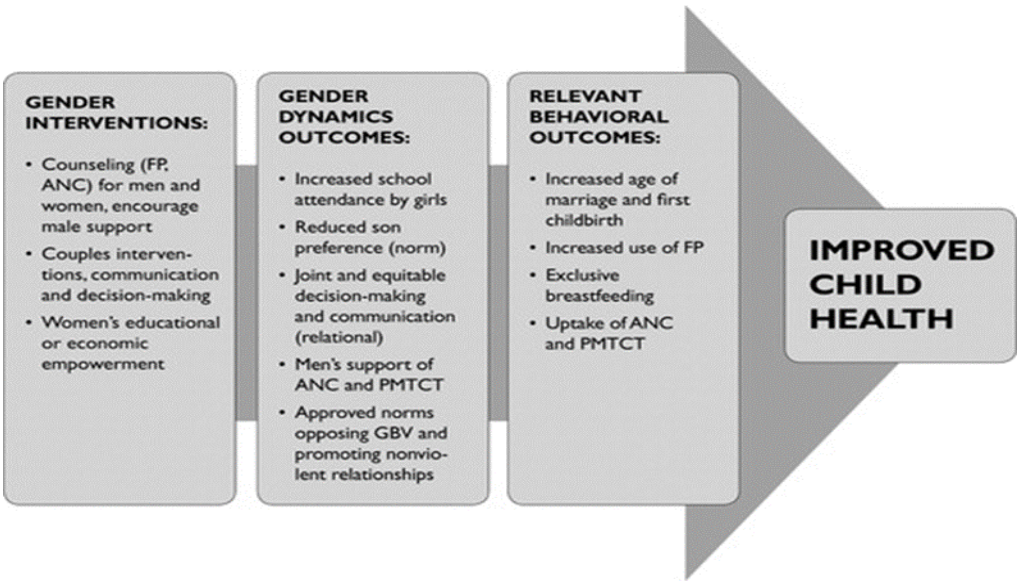
The causal pathway of male involvement interventions revised

The importance of communication, shared decision making and gender-equitable relationships have started to become more recognised within male involvement research and programming in the last years[48, 41]. We found an association between better knowledge of danger signs and communication between men and women (Study 3), while antenatal care attendance was not correlated with higher knowledge. Another study from Mozambique showed that communication and joint decision-making with the partner was associated with higher institutional delivery[152]. Tokhi et al. explained these associations by an explanatory model (see Figure 8) showing how male involvement programs can have a positive effect on couples' communication, dynamics and shared decisions, eventually leading to improved maternal health outcomes. Nevertheless the explanatory model is an assumption rather than confirmed, due to the nature of the included studies (being

mostly observational with a lot of confounding factors) [41].

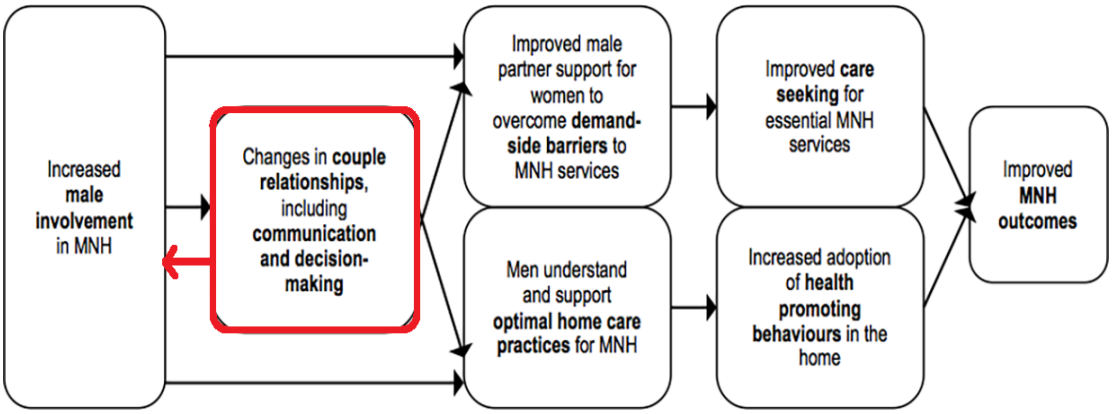
Looking at programs aiming improving gender equality at an early age (among children, adolescents, and young adults) a systematic review found they can lead to a lifetime of improved health and wellbeing, including better maternal health outcomes[224]. This is in line with the pathway of Kraft et al. (2014), demonstrating that interventions directed at shifting gender norms and inequalities between women and men in access to health services and other resources (see building block 1, Figure 7) will positively affect the health of women, men, and their children[225]. Within this research lens the primary aim is to transfer gender norms in communities, leading to more healthy relationships, with a positive effect on the involvement of men in maternal health care services, eventually leading to improved child and maternal health outcomes[225, 42].

Figure 7 Pathway of Kraft et al. (2014) regarding gender interventions and improved child health outcomes[225]



Taking into account these findings the explanatory model of Tokhi et al. might be revised: gender sensitive interventions and the accompanied changes in the couple relationships (including communication and decision making) might be the starting point rather than the consequence of male involvement programs in maternal and newborn health.

Figure 8 Explanatory model of Tokhi et al. regarding male involvement in MNH with an added pathway in red[41]



I believe male involvement programs should consider both pathways and pay attention to gender equality and healthy relationships in every male involvement strategy as a starting point. Too often instrumental policies have completely ignored gender issues when inviting men (=being "gender-blind"), leading to limited success and potential harmful effects on women's rights and empowerment[72, 225]. In this context health providers are crucial in recognising unhealthy relationships (being abusive in its most extreme form) and adapting their strategy for involving the male partner. If health providers believe the presence of the partner is compromising women's autonomy, they should also be able to plan a consultation without the male partner for discussing sensitive and private issues. In conclusion I recommend that male involvement projects invest in promoting gender equality within the community and health centre (by organising high quality couple consultations in combination with regular ANC for example) before taking an obligatory policy regarding male participation in ANC.

Towards a broader holistic scope in male involvement programs

The focus on male participation in maternal health care services without taking into account the broader context (being the relationship dynamics for example) of

male involvement in maternal health has also resulted into the use of a narrow set of indicators to assess "male involvement in maternal health" . As mentioned earlier, the male involvement strategy of the Ministry of Health of Mozambique proposed only HIV related indicators to assess the involvement of men in maternal health, just as several other national and international studies about male involvement [144, 226, 218]. However, this does not correspond with how male involvement is perceived and described by young parents in qualitative studies.

In southern Mozambique male involvement was described by both men and women as "being there" (Study 3). Showing interest in the pregnancy was represented as a way of showing love towards the female partner and in the community taking care of the partner during pregnancy (both financially and practically) was considered as a man's responsibility. By reviewing qualitative literature regarding the meaning of male involvement in maternal health globally, I noted that the core elements of the concept are very similar worldwide (including elements such as financial, emotional, and practical support and being physically present). However, this has not (yet) been translated into a clear definition and assessment of male involvement in maternal health worldwide[208, 227].

Based on this gap in the literature the conceptualisation of male involvement in maternal health was examined globally, together with the use of indicators in the quantitative literature (Study 5). The findings showed that researchers often focus on a single aspect of male involvement, resulting in a narrow set of indicators, with one third of studies using a single indicator (mostly ANC attendance). Aspects such as communication, shared decision making and the subjective feeling of support have received little attention.

Male involvement programs are often linked to PMTCT strategies in Mozambique and many other countries[206, 207, 139, 208], which explains the high focus on ANC attendance and HIV related indicators. PMTCT programs, often funded by the US and Europe, have implemented strong policies to get male partners tested for HIV during ANC in the past without looking at the broader social context (such as unequal power relations between men and women and the risk of HIV stigmatisation)[82]. Within these programs involving men in maternal health was mainly a technical fix for reducing the spread of HIV. This can be seen as a form colonialism in global health (whereby certain policies are forced upon countries in the South without looking at the local context and social consequences). Also looking at the broader social context of male involvement in maternal health (and adapting programs to the local needs and context) could be one step forward in decolonising global health[228]. In general, a broader holistic scope in the implementation and assessment of male involvement programs is highly needed to broaden their potential and stimulate a gender-transformative approach. Further-

more a wider assessment can also shed light on potential negative side-effects (such as a negative effect on women's rights and empowerment) and provide recommendations on how to avoid them.

The relationship between women's autonomy and male involvement is not well understood until today, because both concepts are multidimensional and often not investigated simultaneously [229, 230]. Nevertheless both male involvement and women's empowerment are associated with improved maternal health outcomes and ideally programs should be designed to achieve both at the same time[231]. Thapa et al. (2013) found that spousal communication is highly associated with birth preparedness (which is in line with my findings in Study 4) and is probably a strong mediating factor in achieving both women's empowerment (eg women take part in the decisions) and male involvement (eg men provide financial and practical support in case of emergencies)[231]. Based on those findings I believe it is important to take into account different aspects of women's autonomy (such as decision making power) and spousal communication when implementing and evaluating male involvement programs.

Development of a global framework for male involvement in maternal health

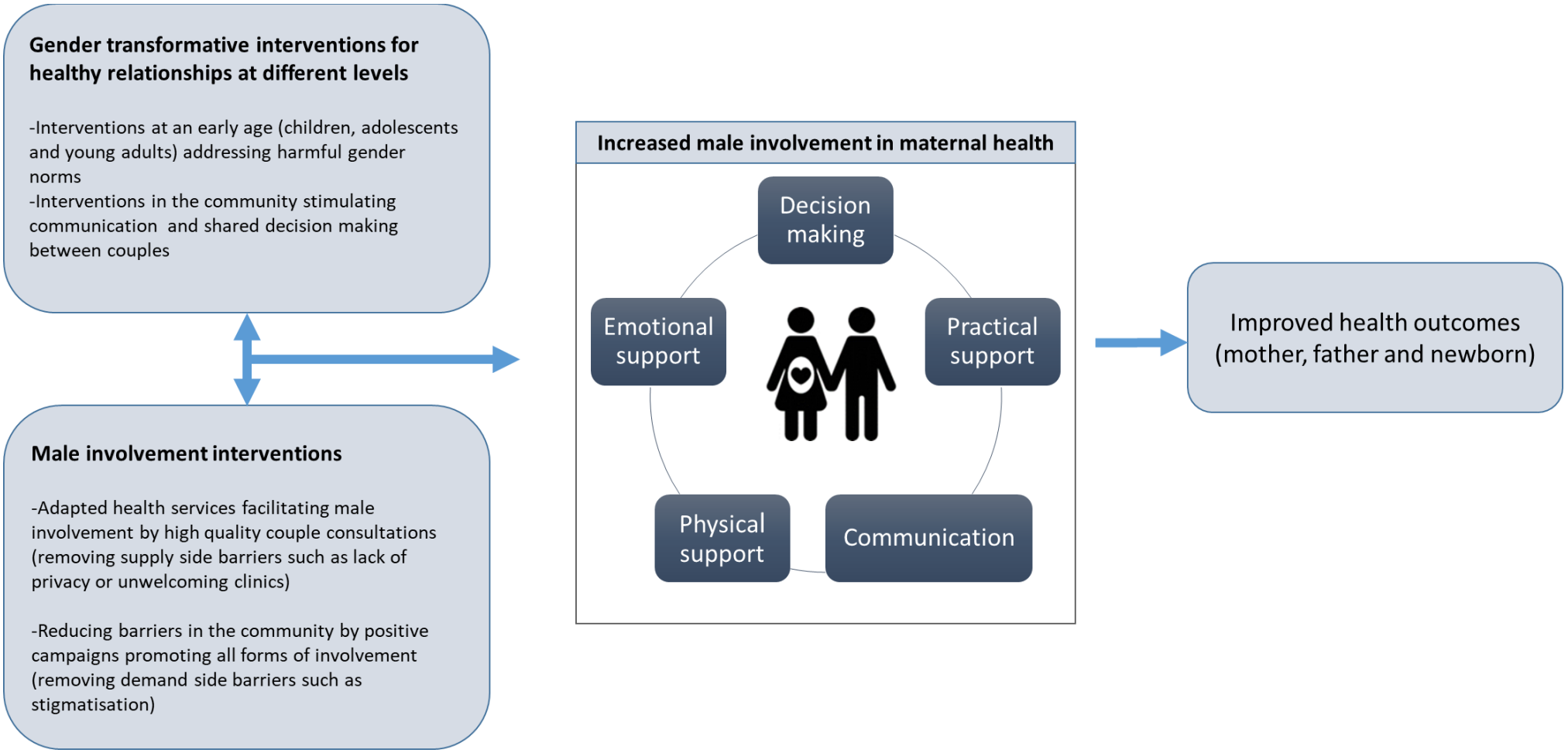
For providing future researchers and program planners with guidance on how to assess male involvement more multidimensionally, input from an international panel of experts was asked regarding a list of core constructs and indicators for the assessment of male involvement in maternal health. The results of this international Delphi study guided the development of a framework for the assessment of male involvement in maternal health from a global perspective. The framework consists of different core elements (communication, decision making, practical, emotional and physical support) of male involvement, that are considered to be universal and relevant for improved maternal, new-born and broader health outcomes (including those of the male partner himself).

This male involvement framework builds further upon my previous conclusions regarding the importance of taking into account the broader context of the woman and the relationship with her male partner in male involvement programs. Both instrumental actions are included in the final framework (such as savings during pregnancy and ANC attendance) as broader relationship dynamics (such as decision making , communication and perceived support from the partner). Nevertheless the framework only narrowly covers some assessment of women's empowerment and gender constructs, which might need further investigation. While several more extended scales exist to measure women's empowerment and gender quality (eg Gender-Equitable Male scale[232] and Sexual Relationship Power Scale[233]), they are often developed in the context of gender transformative HIV and violence interventions and not yet adapted for the use in maternal health care programs[234]. Intervention programs can be categorized as gender transformative if they explicitly focus on a critical examination of gender-related norms and expectations (particularly those related to masculinity) and on increasing gender-equitable relationships, attitudes and behaviors[235]. While this dissertation showed gender equality and women's empowerment are important factors that should be considered when involving men, the relationship between all those concepts is not clear. For examining the relationship between male involvement, gender equality and women's empowerment more in depth scales will need to be developed and validated. In addition every male involvement program needs an evaluation by qualitative data collection for a correct interpretation of the findings. As emphasized by Thapa et al. (2013)[231], any quantitative assessment, including our set of indicators proposed in the framework (Study 6), will hardly distinguish "male dominance" from "male involvement" , which needs further investigation by qualitative data. In conclusion the framework should be considered as a tool for a multidimensional assessment of male involvement in maternal health, which

should be adapted to the context and can evolve over time based on new insights.

To finalise this discussion I would like to present the findings in the form of a new visual pathway (see Figure 9). I believe every male involvement intervention should incorporate a gender transformative approach and involve a multidimensional assessment of the concept "male involvement in maternal health" (including communication, decision making, practical support, physical support and emotional support) for obtaining improved outcomes for the mother, newborn and wider family (including the father). According to this framework, male involvement can be defined as the emotional, practical and physical support by the male partner during pregnancy and childbirth together with communication and shared decision making with the woman in order to obtain the highest standards of health for the woman, male partner himself and newborn. Within this definition health is not limited to physical or emotional health. I would like to add an emphasis towards the ability to adapt and self manage health in the face of social, physical, and emotional challenges according to the definition of Huber and colleagues[236, 237]. Especially in the event of pregnancy, characterised by several physical and emotional changes, the ability to cope with these changes is important. Every study included in the thesis was fundamental for coming to this final framework and definition and the practical recommendations based on the findings will be discussed in the next section.

Figure 9 Pathway for male involvement in maternal health



6.2 Limitations

The studies included in this thesis have several limitations. In each paper I described the particular limitations concerning each study, here I will focus on the more general limitations of the collection of studies as a whole.

First of all, all studies conducted in Mozambique were taking place in southern Mozambique, mainly in the district of Manhiça, the district of Marracuene and Maputo City. The selection of these study sites was motivated by two main reasons. First, I noticed a lack of studies regarding the role of the male partner in maternal health in that area, while the specific characteristics of the region (close to the border with high prevalence of labour migration and patrilineal system) made it an interesting case. Second, I was working in a research group with strong previously established relationship with health directors in that region, which would facilitate implementation of the research activities. Both districts are close to the capital, and as a consequence are often considered as "semi-urban regions" . This setting cannot be considered as a rural area neither urban region, however, with the rapid urbanisation in many African countries the setting is not unique[238]. I have to acknowledge our findings have limited generalisability because of the limited covered area, although they are also useful for other regions in and outside Mozambique taking into account the specific context.

Another limitation of the included studies was their observational design. None of them used an experimental design whereby our findings, hypotheses or recommendations could be soundly tested. While initially a Randomised Controlled Trial (RCT) was planned to evaluate a male involvement intervention, I stepped back from that plan. The situation analysis (Study 3 & Study 4) showed that an intervention whereby we mainly focus on inviting men into antenatal care would have failed to achieve our objectives, because of the current quality gaps in antenatal care. Instead I deepened my understanding of the current barriers and practices to come to more nuanced recommendations for future research and interventions. Currently an evaluation project (with a quasi-experimental design) is being implemented in Marracuene, based on the findings of the thesis, but time wise it was impossible to include that research project into the thesis on top of the other findings.

Closely related to the limitation discussed in the previous paragraph we acknowledge not all listed recommendations are easy to implement in a LMIC with limited resources, for example better trained health providers, more privacy and better equipment in all health facilities. Also transforming deep rooted gender norms and inequality are slow processes that cannot be obtained by single short term

interventions. Nevertheless we believe also these very ambitious recommendations should be made and repeated, in order to strive for the highest standard of care for every pregnant women worldwide.

Another limitation is related to the lack of in depth individual interviews among women and providers regarding the topics covered in this thesis (respectful maternity care and the role of the male partner). I have chosen FGDs with the purpose of gaining multiple perspectives from a large group. However, for sensitive issues and more individual experiences in depth interviews are more appropriate. Therefore I might not have covered specific views of certain groups (such as younger people and single women), that might have felt unconfident in the group discussion. Additional research with specific research methods will be needed to also include the views and perceptions of vulnerable populations and hard-to-reach populations regarding the topic.

In addition I only examined a particular aspect of quality of care in this thesis by focusing on D&A according to the definition of Bowser and Hill. Respectful maternity care often includes also a broader quality assessment (for example were all necessary examinations done to safeguard the women's health). In this study I did not collect data regarding broader quality of care indicators related to provision of care during ANC (for example blood pressure screening) or childbirth (for example use of uterotonics for the prevention of postpartum haemorrhage during the third stage of labour). Midwives reported that disrespectful treatment often occurred during obstetric emergency situations (Study 2) and quality of care problems seem to go beyond the occurrence of disrespectful treatment[104]. Augusto et al. (2018) showed that the availability of emergency obstetric care in public facilities has not improved over the last years in Mozambique, while more women are delivering in a health facility [239]. As a consequence quality improvements should go beyond investing in respectful care, with an emphasis on the 24 hours around birth for saving women and newborn's lives. Studies also looking at broader quality of care indicators are needed and could provide strong evidence for improving maternal health in the country.

Lastly, some form of researcher bias will have played a role in conducting the different studies (from designing the study to interpreting findings). It is important to know that I have a degree in midwifery and that the thesis is written from a predominantly medical perspective, focusing on maternal health outcomes. I have worked side by side with the local midwives of the central hospital in Maputo (before starting my PhD research), which can be considered as both an advantage and disadvantage for conducting qualitative research[240]. Being an "insider" can facilitate trust and understanding between me and the midwives which can lead to honest and open discussions. But a disadvantage might be that I was considered

as an advocate rather than a researcher (they might stress certain events in the hope that I will strive for them or choose their side). Also in the interpretation of findings I might have focused on the things I recognise myself or the more dramatic stories rather than an objective analysis. Furthermore I have to acknowledge I only documented one side of the story as doctors/gynaecologists and women themselves were not heard by qualitative interviews.

Besides my professional background as a midwife also my personal views and experiences in life might have influenced this dissertation. By growing up in Europe, especially predominately western ideologies and societal discourses might have biased findings. There are several ways to try to minimise this researcher bias. I have tried to engage with research participants as co-creators of knowledge. The study findings regarding the occurrence of disrespect and abuse for example have been disseminated by discussion groups with health providers and health directors in order to share knowledge in two directions. Self reflection is another approach for minimising bias in qualitative research. While I have always reflected on my role as a researcher in the different studies and disclosed my position in the different articles, using a frame of reference about my own preconceptions and ideas before starting data collection would have been a better approach. Diverse peer review is also an approach to minimise researcher bias [241]. I was surrounded by four promotors (including one co-promotor) with different backgrounds, although mainly from the medical field (2 gynaecologist, 1 epidemiologist and 1 social scientist), which can be considered as a limitation. Several findings are closely related to human rights (see all literature regarding "human rights during childbirth") and the social sciences (including topics such as family studies and gender equality). It is important to realise studies are conducted from the viewpoint of improving maternal health rather than human rights or family relationships. I believe future research and strategies regarding respectful care and male involvement in maternal health might benefit from a more multidisciplinary approach, whereby input from sociological experts is highly needed.

6.3 Implications for policy and practice

In the literature there is a consensus that men should be involved in maternal health for improving maternal and newborn health outcomes[242, 243, 47]. WHO formulates this in their health promotion recommendations [31] as follows: "Male involvement interventions are recommended, provided that they are implemented in a way that respects, promotes and facilitates women's choices and their au-

tonomy in decision-making and supports women in taking care of themselves and their newborns. In order to ensure this, rigorous monitoring and evaluation of implementation is recommended." However, very little guidance exists on how male involvement programs can also guarantee that women's choices and preferences are respected. Based on our findings I will provide some more detailed recommendations for both policy and daily practice.

First, I believe antenatal care consultations need to be adapted and improved in order to guarantee high quality care for both the women and male partner in southern Mozambique. Both the infrastructure of the facilities and skills of the health providers need to be enhanced in order to offer high quality care for both the woman and partner. I believe simply inviting men into ANC without adequate counselling fails the objective of involving men into the different aspects of pregnancy and childbirth (such as birth preparedness and psychological support). The practice of giving priority to couples should also be revised. The importance of promoting gender equality when inviting men is key in every male involvement strategy, and the current priority rule for men undermines the promotion of gender-equitable relationships. The introduction of couple oriented ANCs on a separate day should be further explored, as I believe this approach might limit waiting time, minimise stigmatisation of single women and make men more comfortable among other men.

Second, the efforts of the MoH to introduce the principles of respectful maternity care into the public provision of maternal health care should be continued, hereby prioritising the most disadvantaged regions in terms of health human resources and infrastructure. The element of choosing a birth companion of choice should be implemented without any restrictions. However, before also men can be invited as birth companions privacy issues will need to be addressed, together with changing providers' attitude. In addition our study highlighted that the occurrence of disrespectful treatment towards women in maternity care cannot be solely solved by increasing health workforce or infrastructure, also midwives' status within the health system and society need to be addressed. Especially in the capital, midwives reported disrespect by patients and a lack of status in the health system. They perceived that doctors received more respect within the health system hierarchy (with better legal benefits and less blaming). Some midwives also reported they were treated badly because of discrimination against women, whereby especially male doctors were systematically more respected. These findings were in line with the findings of a global study about midwives realities by WHO in 2015 [244] that recommended to transform complex hierarchies of power within the health system together with gender dynamics. Interestingly enough, our study showed midwives themselves also tend to show more respect to men than women during ANCs,

demonstrating a deeply rooted systematic gender inequality within society at all levels. A quote cited by Tvedten et al, based on a study about gender equality in southern Mozambique, still seems a reality today: "'A woman should not be the boss when a man is present" [245]. In line with the studies of Ndigwa & Warren in Kenya I believe that improving midwives' working environment in terms of constructive supervision and promoting positive gender equal relationships with colleagues and superiors has the potential of improving provider-client interactions and women's care[183, 246].

At a more global level, I believe a more multidimensional assessment and approach is recommended for improving male involvement in maternal health. The focus on male attendance and HIV testing as main intervention for improving male involvement in maternal health has been a successful strategy for PMTCT programming, but for assessing broader public health concerns such as gender equality and reducing health inequalities a more tailored approach is needed. Integration of gender equality interventions into male involvement programming and vice versa can potentially have a synergistic effect (whereby the combination might be even more effective than the two separate) on maternal health and broader health outcomes. In addition a more multidimensional assessment of male involvement might lead to more specific interventions differentiating between the different aspects of men's potential role (being the provision of physical, practical, and emotional support or shared decision making and improved communication) in improving health outcomes.

6.4 Future Research

I gave several specific directions for future research in the articles. In this section I would like to focus on a more general recommendation regarding the type of research that might be highly relevant for improving the evidence base regarding the involvement of men in maternal health in the future.

Until now majority of male involvement programs have focused on the implementation of different interventions with the aim of answering the simple question "does it work?" [247, 248, 62, 249]. Most studies report improved outcomes such as more men attending antenatal care, increased HIV testing and increased financial support[247, 248, 62, 249]. However, many questions remain unanswered. Mostly very little information is available in male involvement studies regarding the following more "realistic" questions: "What works, for whom, in what respects, to

what extent, in what contexts, and how?" [250]. In many studies information about the men who are actually not coming is lacking, it is not known what are potential side effects of the intervention are and mostly it is not known what effect the intervention had on other outcomes such as the women's autonomy and relationship with her partner. Surprisingly, only a handful of intervention studies report negative results or side-effects of male involvement programs [41] while qualitative studies have reported how complex the involvement of men in maternal health is, with different norms, attitudes and interests tangled among different stakeholders [36, 200, 251]. This contradiction suggests programs probably do not assess all potential (negative) side-effects and/or do not publish them. I suspect there is a serious publication bias, whereby only successful programs and outcomes are published. Our systematic review showed that the wide array of male involvement indicators also allows researchers to only report their most significant results by choosing the most suitable indicators. Underreporting of negative results is problematic because it introduces bias into interpretation of the literature, which consequently misinforms researchers, health directors and policymakers.

Multi-component interventions aimed at involving men in pregnancy and childbirth can be considered as complex interventions that also need to be implemented and evaluated as such. Overall, global health interventions are often not sufficiently supported by theories and analytic frameworks, while theories and analytic frameworks can improve the quality and rigour of the implementation and evaluation of interventions[252]. The Context and Implementation of Complex Interventions (CICI) framework of Pfaudenhauer et al. is such a framework and provides several tools and checklists to assist researchers in simplifying and structuring complexity in order to advance the understanding of whether and how interventions work[253]. Assessing the impact of male involvement interventions should go hand in hand with these types of implementation evaluations to understand the processes, causal mechanisms and contextual factors shaping the outcomes of the intervention[252]. Within this aspect a more realistic approach when evaluating interventions is needed. A realist evaluation analyses the complex processes underlying programmes by formulating plausible explanations but also indicates the conditions in which the intervention works (or not) and how they do so[254, 250]. By exploring these configurations of change, realist evaluations aim to understand how an intervention is expected to work within specific contexts and what conditions may hamper successful outcomes, in order to generate policy relevant findings that can be transferred across settings and contexts[255]. This realistic specification allows decision makers to assess whether interventions that proved successful in one setting may be useful in another setting and assist programme planners and policymakers in tailoring interventions to suit specific contexts[255, 250]. Especially in a LMICs were the conditions of the intervention can often not be replicated

over the whole country due to limited resources, program planners and policymakers can benefit from specific practical recommendations placed into context [256].

I believe our male involvement framework will be useful in the context of more realist evaluations, whereby different aspects of male involvement in maternal health are considered. Furthermore the relationship between different outcomes (such as gender equality and different forms of male involvement) needs further investigation. A male involvement intervention might report to be successful in increasing one aspect of male involvement such as male attendance at ANC for example, but also report less favourable outcomes in increasing shared decision making and communication among couples. As a consequence future programs might invest more in those aspects of male involvement (improving shared decision making and communication), besides increasing ANC attendance among male partners. By this more multidimensional and realistic approach I believe the health gains of involving men in maternal health can be strengthened, become more sustainable on the long term. Furthermore health gains might go beyond improving maternal health with positive effects on broader outcomes such as gender equality and child health.

6.5 Conclusion

This dissertation has discovered the complexity of involving men in maternal health care, together with the challenges of providing respectful maternity care in a low-income setting. Our findings suggest a high demand and willingness of both men and women in the community for a more participating role of men in maternal health, but until now only some narrow focused interventions have been implemented for involving men into antenatal care in southern Mozambique (being the use of invitation cards and giving priority to men in the waiting line) with limited success.

According to the quality standards of WHO for care during pregnancy and childbirth men should be counselled and informed during pregnancy and might even take up the role of birth companion, in line with the principles of respectful maternity care. However, the current organisation and quality of maternal health care services in southern Mozambique seems a serious bottleneck in adhering to those recommendations. I found that the provision of RMC and the involvement of men seem to be hampered by the same challenges, being privacy issues, limited training of health providers and a high workload. In addition there is a persistent gender inequality within society and the health system, negatively affecting how midwives are treated in the health system hierarchy, but also negatively affecting

women's role in the consultation when they are accompanied by a partner.

The findings suggest a "one fits all" approach for involving men into maternal health will hardly work, and that every strategy will have its limitations. Focusing on an instrumentalist approach of involving men for improving maternal health care access and uptake works for a vast majority of women, mostly those in trustful relationships, but might be harmful for others. Unintended (negative) side-effects of male involvement programs are hardly documented in the literature and should be assessed and explored more often. The promotion of gender-equitable relationships into every male involvement strategy is key for limiting negative side-effects of male involvement.

Overall, the effect of involving men into maternal health on outcomes such as gender equality and women's empowerment should receive more attention, as they have a high impact on women and men's health on the long term. A broader holistic scope, involving a multidimensional assessment in male involvement interventions, might give more sustainable results on maternal health and broader health outcomes in future programs. Our global framework for assessing male involvement in maternal health provides an opportunity for improved monitoring and reporting of male involvement interventions at a global level and can facilitate ongoing efforts to broaden the evidence base regarding male involvement in maternal health.

Chapter 7

Appendices

7.1 Appendix 1: Broader context

Natural disasters and human development

Disasters linked to natural hazards can have devastating impacts and harm human development. Scientist are warning already for years that disasters will become more common as the climate crisis worsens and Mozambique is one of Africa's most vulnerable countries to climate change. Poverty, weak institutional development and frequent extreme weather events contribute to Mozambique's vulnerability [257, 258]. On 14 March 2019 tropical Cyclone Idai made landfall at the port of Beira, Mozambique, before moving across the region. Millions of people in Malawi, Mozambique and Zimbabwe were hit by Southern Africa's worst natural disaster in at least two decades. Six weeks later also Cyclone Kenneth made landfall in northern Mozambique, the first time in recorded history that two strong tropical cyclones hit the country in the same season. The cyclones left around 1.85 million people in Mozambique in urgent need of humanitarian assistance. The cyclones were only the beginning of what has become an education and health disaster, together with increased poverty levels and food insecurity. Around 3,400 classrooms had been destroyed or damaged in Mozambique, with close to 305,000 children losing out on lessons at school after the floods. Malaria cases rose to 27,000in the region, and cholera cases to almost 7,000. About 1.6 million people received food assistance, and close to 14,000 people had to live in displacement centres. Women and children seem to be most affected by the disaster, with women and girls reporting a significant increase in their daily chores and struggles in the wake of Idai, due to massive destruction of roads, water sources, houses and schools. Furthermore women and girls are at greater risk of exploitation, sexual

violence, unplanned pregnancies and unsafe abortions when they are dislocated from their communities[259]. Cyclone Idai also affected more than 75,000 pregnant women and at least 35 health facilities were fully or partially destroyed[257]. The ongoing displacement has also created additional risks of children being vulnerable to exploitation, separated from their families, and dropping out of school. Very recently, in January 2021 another storm (Eloise) made landfall near Beira in central Mozambique. The storm damaged more than 8,800 houses and at least 26 health centres and disrupted again the recently restored power and communication links. The cumulative effects of the storms and further threats by climate change will only be fully understood over the next few years[260, 93].

New threats to peace

After years of relative "peace" , a low-intensity conflict re-emerged between the government and RENAMO (Resistencia Nacional Mocambicana) in 2013 when the latter attacked a Police Station in retaliation of a police raid on its local headquarters in April of that year. A series of clashes ensued, until the signing of a ceasefire that preceded the October 2014 general elections in which President Filipe Nyusi was re-elected and FRELIMO retained majority status in the National Assembly. But also after the elections, the conflict continued and RENAMO disputed the election results citing irregularities on the government's part. Furthermore Mozambique's instability is no longer limited to the long-established conflict between the government, largely made up of FRELIMO, and RENAMO, as the country faces other multifarious challenges. The security situation has been aggravated by an Islamist militia group that came up in October 2017 and has since gained traction in northern Mozambique[261]. Attacks conducted by armed groups have increased significantly in Palma, Nangade and Macomia districts over the last years and more than 530,000 people are now displaced in Cabo Delgado, Nampula, Zambezia and Niassa provinces, according to official estimates[262].

Neonatal and infant health

A study in Mozambique on the effects of health-system strengthening on neonatal mortality and child mortality demonstrated that neonatal mortality rate was most strongly associated with institutional birth attendance, maternal and child nurse density, and overall health workforce density, while infant mortality rate was most strongly associated with institutional birth attendance and population per health facility[126]. Service availability (including the number of health providers and health facilities) is essential for guaranteeing high quality of care. Notably, the population is growing in Mozambique which is not always associated with and increased number of health facilities and health providers in the different regions, challenging health gains in the future.

Health system

In 1992, there came an end to the civil war in Mozambique, which has led to a

process of democratization, and social, and economic recovering efforts, in which foreign aid played an important role in the transition from war to peace[263, 264]. Rebuilding the primary health care system, with maternal and child health at its centre, has been the government's top health priority since the end of the civil war. The reconstruction of the health sector was guided by the Health Sector Policy 1995-1999 and the Health Sector Recovery Program. These policies put the emphasis on: primary health care (with particular attention to maternal and child health), immunisation and communicable disease control, the rehabilitation of infrastructure and improvement of the quality of care, providing better incentives to medical staff, and strengthening logistical and administrative management[265].

In May 2000, the Ministry of health (MoH) and its partners signed the Code of Conduct, called the "Kaya kwanga Code of Conduct" , a mechanism to regulate the relations between the MOH and its development partners[266]. The MOH and its development partners decided to establish the Sector Wide Approach (SWAp) for Programming process. While the fund was praised the way it allowed Western donors to support health-system fundamentals, it has always represented a small fraction of total aid to the health sector, varying from 5 to 20% [267]. The aim was to strengthen national procedures, to focus attention on shared objectives, to bring together resources, to reduce transaction costs and to improve aid effectiveness under the leadership of the MOH, and to monitor developments in the health sector against agreed benchmarks. As a consequence aid has shifted markedly toward general budget support instead of project support since 2000. The latter had a positive impact on health system strengthening, although several studies claim that still majority of donor funding goes to NGOs instead of the public sector health[268, 267, 269]. As a result health system coverage[1] has barely changed in the last decade with the workforce/ population ratio being still among the five worst in the world at 71/10000[267].

In 2001, the first Health Sector Strategic Plan (HSSP I: 2001–2005) was launched and maternal and child health was one of the priorities. Following the approval of HSSP I by the Central Government, the MOH approved its first national strategy to reduce maternal mortality in 2001. This strategy emphasizes the promotion of the availability, access, and use of Emergency Obstetric Care (EmOC) services as the main intervention for maternal mortality reduction. Noteworthy the MMR decreased from 692 in 1997 to 408 in 2008, which was attributed to the national plan and strategy for the reduction of maternal and newborn mortality in 2001, with better diagnosis and treatment of obstetric complications and

[1]Health system coverage is defined by WHO as ensuring that all people have access to needed health services (including prevention, promotion, treatment, rehabilitation and palliation) of sufficient quality to be effective while also ensuring that the use of these services does not expose the user the financial hardship.

greater access to quality health services, including antenatal consultations and family planning[268, 270].

Also in the last 20 years the country has undertaken several initiatives aiming to strengthen the health system and improve access to services. In 2007, Mozambique joined the International Health Partnership (IHP), now called Universal Health Coverage 2030 Partnership (UHC) [271]. This partnership includes a commitment to 'work effectively together with renewed urgency to build sustainable health systems and improved health outcomes'. The Compact signatories commit to: improve aid coordination; increase the predictability of donor aid flows; work towards strengthened country health systems; and renew commitment to mutual accountability and transparency[272]. The UHC Partnership also supported the development of a national health policy to guide UHC and primary health care interventions. The latest Health Sector Strategic Plan for 2014 to 2019 is based on two specific strategic pillars: "more and better health services" and a "reform and decentralisation agenda" . The HSSP pays special attention to women, adolescents, youth, children, and (for the first time) older people[273].

7.2 Appendix 2: Documents ethical approval

Universitair Ziekenhuis Gent

Afz: Commissie voor Medische Ethiek (UZP074)

Uro-Gynaecologie
Polikliniekgebouw 3 - 1ste Verdieping
Prof. dr. Olivier DEGOMME
ALHIER

COMMISSIE VOOR MEDISCHE ETHIEK

Voorzitter:
Prof. Dr. D. Matthys
Secretaris:
Prof. Dr. J. Decruyenaere

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UW KENMERK	**ONS KENMERK**	**DATUM**	**KOPIE**
	PA 2016/029	18-nov-16	Zie "CC"

Preliminaire Goedkeuring Doctoraatsonderzoek: The forgotten father: a multicomponent intervention targeting mento increase uptake of antenatal care in low resource settings.

Doctorandus: Anna Galle

Beste Collega,

Op 16/11/2016 ontvingen wij uw schrijven met het verzoek om het bovenvermeld projectvoorstel binnen het Ethisch Comité te bespreken.

Het Ethisch Comité verklaart zich momenteel akkoord met het voorlopig uitgeschreven protocol, zodat het projectvoorstel verder door de doctoraatscommissie kan worden uitgewerkt.

Graag kreeg het Ethisch Comité nadien het volledig uitgewerkt protocol, zoals de normale procedure dit vraagt in verband met klinische studies.

Wij vragen u steeds het PA nummer te vermelden op de nieuwe aanvraag.

Met collegiale groeten,

Prof. dr. D. Matthys
Voorzitter / Chairman

Muriel Fouquet
Tel: 09/332 33 36
Muriel.fouquet@uzgent.be

Afz: Commissie voor Medische Ethiek

Uro-Gynaecologie
Poliklinieкgebouw 3 - 1ste Verdieping
Prof. dr. Olivier DEGOMME
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COMMISSIE VOOR MEDISCHE ETHIEK

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UW KENMERK	**ONS KENMERK**	**DATUM**	**KOPIE**
	2018/1319	20-nov-18	Zie "CC"

BETREFT

Advies voor monocentrische studie met als titel:
Male Involvement in antenatal care in Southern Mozambique: a mixed method study
Betrekken van de man tijdens de zwangerschap in Mozambique: een mixed method study.

Belgisch Registratienummer: B670201837841

* Adviesaanvraagformulier dd. 24/10/2018 (volledig ontvangen dd. 26/10/2018)
* Begeleidende brief dd. 18/10/2018
* (Patiënten)informatie- en toestemmingsformulier dd. 18/10/2018 (Engels en Portugees)
* Protocol dd. 18/10/2018 (E.)
* Vragenlijsten
  - Interview guide IDIs (dd. 18/10/2018) E.
  - Interview guide FGDs providers (dd. 18/10/2018) E.
  - Interview guide FGDs community (dd. 18/10/2018) E.
  - Male involvement index questionnaire (dd. 18/10/2018) E.
  - Exit IV with women (dd. 18/10/2018) E.
* Budget Proposal dd. 18/10/2018
* Diverse
  - SOP IDIs (dd. 18/10/2018) E.
  - SOP FGDs (dd. 18/10/2018) E.
  - SOP Translation & Transcription (dd. 18/10/2018) E.

Advies werd gevraagd door:
Prof. dr. O. DEGOMME ; Hoofdonderzoeker

BOVENVERMELDE DOCUMENTEN WERDEN DOOR HET ETHISCH COMITÉ BEOORDEELD.
ER WERD EEN POSITIEF ADVIES GEGEVEN OVER DIT PROTOCOL OP 19/11/2018. INDIEN DE STUDIE NIET WORDT OPGESTART VOOR 19/11/2019, VERVALT HET ADVIES EN MOET HET PROJECT TERUG INGEDIEND WORDEN.
Vooraleer het onderzoek te starten dient contact te worden genomen met Bimetra Clinics (09/332 05 00).

THE ABOVE MENTIONED DOCUMENTS HAVE BEEN REVIEWED BY THE ETHICS COMMITTEE.
A POSITIVE ADVICE WAS GIVEN FOR THIS PROTOCOL ON 19/11/2018. IN CASE THIS STUDY IS NOT STARTED BY 19/11/2019, THIS ADVICE WILL BE NO LONGER VALID AND THE PROJECT MUST BE RESUBMITTED.
Before initiating the study, please contact Bimetra Clinics (09/332 05 00).

DIT ADVIES WORDT OPGENOMEN IN HET VERSLAG VAN DE VERGADERING VAN HET ETHISCH COMITE VAN 20/11/2018
THIS ADVICE WILL APPEAR IN THE PROCEEDINGS OF THE MEETING OF THE ETHICS COMMITTEE OF 20/11/2018

CONTACT	TELEFOON	FAX	E-MAIL
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UW KENMERK	**ONS KENMERK**	**DATUM**	**KOPIE**
	2018/1319	20-nov-18	Zie "CC"

- *Het Ethisch Comité werkt volgens 'ICH Good Clinical Practice' - regels*
- *Het Ethisch Comité beklemtoont dat een gunstig advies niet betekent dat het Comité de verantwoordelijkheid voor het onderzoek op zich neemt. Bovendien dient U er over te waken dat Uw mening als betrokken onderzoeker wordt weergegeven in publicaties, rapporten voor de overheid enz., die het resultaat zijn van dit onderzoek.*
- *In het kader van 'Good Clinical Practice' moet de mogelijkheid bestaan dat het farmaceutisch bedrijf en de autoriteiten inzage krijgen van de originele data. In dit verband dienen de onderzoekers erover te waken dat dit gebeurt zonder schending van de privacy van de proefpersonen.*
- *Het Ethisch Comité benadrukt dat het de promotor is die garant dient te staan voor de conformiteit van de anderstalige informatie- en toestemmingsformulieren met de nederlandstalige documenten.*
- *Geen enkele onderzoeker betrokken bij deze studie is lid van het Ethisch Comité.*
- *Alle leden van het Ethisch Comité hebben dit project beoordeeld. (De ledenlijst is bijgevoegd)*

- *The Ethics Committee is organized and operates according to the 'ICH Good Clinical Practice' rules.*
- *The Ethics Committee stresses that approval of a study does not mean that the Committee accepts responsibility for it. Moreover, please keep in mind that your opinion as investigator is presented in the publications, reports to the government, etc., that are a result of this research.*
- *In the framework of 'Good Clinical Practice', the pharmaceutical company and the authorities have the right to inspect the original data. The investigators have to assure that the privacy of the subjects is respected.*
- *The Ethics Committee stresses that it is the responsibility of the promotor to guarantee the conformity of the non-dutch informed consent forms with the dutch documents.*
- *None of the investigators involved in this study is a member of the Ethics Committee.*
- *All members of the Ethics Committee have reviewed this project. (The list of the members is enclosed)*

Namens het Ethisch Comité / On behalf of the Ethics Committee
Prof. dr. D. MATTHYS
Voorzitter / Chairman

CC: De heer T. VERSCHOORE - UZ Gent - Bimetra Clinics
FAGG - Research & Development; Victor Hortaplein 40, postbus 40 1060 Brussel

Comité Institucional de Bioética em Saúde da Faculdade de Medicina/Hospital Central de Maputo

(CIBS FM&HCM)

O Dr. Jahit Sacarlal, Presidente do Comité Institucional de Bioética em Saúde da Faculdade de Medicina/Hospital Central de Maputo (CIBS FM&HCM)

CERTIFICA

Que este Comité avaliou a proposta do (s) Investigador (es) Principal (is):
Nome (s): Galle Anna
Protocolo de investigação: sem versão de 19 de Maio de 2017
Consentimentos informados: sem versão de 19 de Maio de 2017
Questionários: sem versão de 04 de 19 de Maio de 2017
Guião de entrevista: sem versão de 19 de Maio de 2017

Do estudo:
TÍTULO: "Male Involvement in antenatal care in Southern Mozambique: a mixed method study."

E faz constar que:
1º Após revisão pelos membros do Comité das respostas dos investigadores das recomendações feitas durante a reunião de 11 de Maio de 2017 pelo Comité, e que foi incluida na acta nº 05/2017, o CIBS FM&HCM, emite este informe notando que não há nenhuma inconveniência de ordem ética que impeça o inicio do estudo.
2º Que a revisão se realizou de acordo com o Regulamento do Comité Institucional da FM&HCM – emenda 2 de 28 de Julho de 2014.
3º Que o protocolo está registado com o número CIBS FM&HCM/08/2017.
4º Que a composição actual do CIBS FM&HCM está disponivel na secretária do Comité.
5º Que não existiu nenhum conflito de interesse registado pelos membros do CIBS FM&HCM.
6º O CIBS FM&HCM faz notar que a aprovação ética não substitui a aprovação científica nem a autorização administrativa.
7º A aprovação tem validade de 1 ano e termina a 21 de Maio de 2018. Um mês antes dessa data o Investigador deve enviar um pedido de renovação se necessitar.
8º Recomenda aos investigadores que mantenham o CIBS informado do decurso do estudo no mínimo uma vez ao ano.
9º Solicitamos aos investigadores que enviem no final de estudo um relatório dos resultados obtidos.

E emite
RESULTADO: ***APROVADO***

CIBS
Jacinta A. A. Silveira
HCM

Assinado em Maputo aos 22 de Maio de 2017

UNIVERSIDADE
EDUARDO
MONDLANE

Faculdade de Medicina

CONSELHO CIENTÍFICO

Exma Senhora
Investigadora
Anna Galle
Maputo

Maputo, aos 17/04/2017

Assunto: Male involvement in Ante Natal Care in Southern Mozambique . Aqualitative study protocol

O Conselho Científico da Faculdade de Medicina analisou as correcções efectuadas no protocolo acima mencionado e sobre o mesmo chegou a seguinte conclusão:

- O Conselho Científico da Faculdade de Medicina não vê nenhum inconveniente que impeça a realização do estudo pelo que, dá a sua devida aprovação.

- O Conselho Científico da Faculdade de Medicina recomenda que a investigadora o mantenha informado do decurso do estudo.

Sem mais de momento as nossas cordiais saudações.

A Presidente do Conselho Científico

Prof. Doutora Esperança Sevene, MD, MSc, PhD
(Professora Associado)

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REPÚBLICA DE MOÇAMBIQUE

MINISTÉRIO DA SAÚDE

GABINETE DA MINISTRA

A

Universidade Eduardo Mondlane
Exma. Senhora
Anna Gale

Nota nº 953 /GMS/ 024 /017

Assunto: Solicitação de autorização para início de estudo intitulado `` Male involvement in antenatal care in Southern Mozambique: a mixed method study´´

Em resposta ao requerimento de V.excia através do qual solicita autorização para aprovação administrativa para a realização do estudo intitulado ``*Male involvement in antenatal care in Southern Mozambique: a mixed method study*", a seguir se transcreve o teor do despacho de Sua Excelência o Senhor Vice- Ministro da Saúde nele exarado:

``Autorizo´´

Assinado Dr. Mouzinho Saíde
(25/05/2017)

Sem mais de momento, as minhas cordiais saudações.

Maputo, aos 29 de Maio de 2017

O Chefe do Gabinete

Fatima Souto

7.3 Appendix 3: Curriculum Vitae Anna Galle

ANNA GALLE

MIDWIFE
PHD CANDIDATE

AFFILIATION

Galle Anna - PhD Student International Centre for Reproductive Health - ICRH Ghent University - Ghent University Hospital De Pintelaan 185 UZP114 - entrance 75 9000 Ghent- Belgium +32/9.332.52.80
http://www.icrhb.org

MAIN INTERESTS

- Maternal Health
- Respectful maternity care
- Role of men
- Low-and middle income countries
- Participatory action research
- Qualitative research
- Quality of Care
- Quantitative research
- Text Mining analysis

REACH ME AT

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ACADEMIC HISTORY

Master of Science (2012-2014)
at Ghent University in Health Promotion
(Diploma cum laude)
Thesis: Barriers to prenatal care among vulnerable Flemish women

Bachelor in Midwifery (2007-2010)
at the Artevelde Hogeschool. (Diploma cum laude)
Thesis: Health promotion during pregnancy in Rwanda

Postgraduate Conflict,Diplomacy and Culture (2011)
at CIMIC, Hogeschool Mechelen.
Thesis: The role of the international community in the civil war in Guatemala
(1960-1996).

Doctoral schools additional courses (2016-2020)
at Ghent University

- Strategies in qualitative data-analysis from a Grounded Theory perspective: from coding transcripts to writing output
- Critical Ethnographic Research Seminar: 'Critical Ethnography and Feminist Epistemology'
- R Course statistical modelling
- Conducting and Publishing a Systematic Review
- Advanced Academic English Writing Skills: Life Sciences and Medicine
- Advanced Academic English Conference Skills
- Project management
- Survival Analysis in R
- Data visualisation in R
- Introduction to R

Others

- Sexual and Reproductive Health Course (Doctors without Borders)
- Post Graduate Course Project Management (Cape Town –46th World Conference on Lung Health)
- BTC-course, Infocycle of the Belgian Development Agency. International course health care issues.

WORK EXPERIENCE

- Doctoral student at ICRH Ghent, Faculty of Medicine and Health Sciences (2017-2021)
- Midwifery Supervisor MSF in Central African Republic (2016)
- Research Assistant at ICRH Mozambique (2016)
- Part time delivery ward Hospital Central Maputo (2016)
- Junior researcher at ICRH Belgium (2015)
- Medical responsible in a primary rural health centre in Guatemala (2011)
- Midwife/Nurse for Randstad Medical in Belgium (2011-2014)
- Midwife in rural health centre Mali (2010)

GRANTS

- Grand Challenges Africa Innovation Seed Grant (€80000)
- Global Minds Program Research Fund (€12 000)
- Marleen Temmerman Fund Small Grant (€5000)

ICT SKILLS

- ✓ R^2 (quantitative data analysis)
- ✓ R^2 (Text Mining)
- ✓ R^2 (RQDA qualitative data analysis)
- ✓ Microsoft Project
- ✓ Microsoft Access
- ✓ Microsoft Office (Word, PP, excell...)
- ✓ Rayyan software
- ✓ SPSS
- ✓ Mendeley

ADDITIONAL EXPERIENCES

- Guest Lecturer at DTMH (Professional Diploma in Tropical Medicine & Hygiene) of London School of Hygiene and Tropical Medicine in Uganda and Tanzania
- Guest Lecturer at Master Community Health UEM (Universidade Eduardo Mondlane , Mozambique)
- Guest Lecturer at Conflict and Development (Ghent University, Belgium)
- Teaching in Master Global Health & Research with internship at Department of Women's and Children's Health, International Maternal and Child Health (Uppsala, Sweden).
- Award Best Oral Presentation at "Research in Progress Meeting" by RSTMH in Moshi, Tanzania

ACADEMIC PUBLICATIONS

- Galle, A., Semaan, A., Elise Huysmans, Constance Audet, Anteneh Asefa, Therese Delvaux, Bosede B. Afolabi, Alison El Ayadi, Lenka Benovamed. **A double-edged sword - Telemedicine for maternal care during COVID-19: Findings from a global mixed methods study of healthcare providers.** BMJ Global Health 2021;6:e004575.
- Galle A, Manaharlal H, Griffin S, Osman N, Roelens K, Degomme O. **A qualitative study on midwives' identity and perspectives on the occurrence of disrespect and abuse in Maputo city.** BMC Pregnancy Childbirth. 2020 Oct 19;20(1):629. doi: 10.1186/s12884-020-03320-0. PMID: 33076861; PMCID: PMC7569757.
- Galle, A., De Melo, M., Griffin, S., Osman, N., Roelens, K., & Degomme, O. (2020). **A cross-sectional study of the role of men and the knowledge of danger signs during pregnancy in southern Mozambique.** BMC PREGNANCY AND CHILDBIRTH, 20. https://doi.org/10.1186/s12884-020-03265-4
- Galle A, Manaharlal H, Cumbane E, Picardo J, Griffin S, Osman N, et al. **Disrespect and abuse during facility-based childbirth in southern Mozambique : a cross-sectional study.** BMC PREGNANCY AND CHILDBIRTH. 2019;19(1).
- Galle A, Cossa H, Griffin S, Osman N, Roelens K, Degomme O. **Policymaker, health provider and community perspectives on male involvement during pregnancy in southern Mozambique: a qualitative study.** BMC PREGNANCY AND CHILDBIRTH. 2019;19.
- Galle A, Vermandere H, Griffin S, de Melo M, Machaieie L, Van Braeckel D, Degomme O. **Quality of care in family planning services in rural Mozambique with a focus on long acting reversible contraceptives: a cross-sectional survey.** . BMC women's health, 18, 201. A1 publication, Impactfactor 1.5
- Galle, A., Van Parys, A. S., Roelens, K., & Keygnaert, I. (2015). **Expectations and satisfaction with antenatal care among pregnant women with a focus on vulnerable groups: a descriptive study in Ghent.** BMC women's health, 15(1), 112. A1 publication, Impactfactor 1.5
- Van Parys, A. S., Deschepper, E., Michielsen, K., Galle, A., Roelens, K., Temmerman, M., & Verstraelen, H. (2015). **Intimate partner violence and psychosocial health, a cross-sectional study in a pregnant population.** BMC pregnancy and childbirth, 15(1), 278. A1 publication, Impactfactor 2.15
- Emilomo Ogbe (UGent), Dirk Van Braeckel (UGent), Marleen Temmerman (UGent), Elin C Larsson, Ines Keygnaert (UGent), Wilson De los Reyes Aragón, Feng Cheng, Gunta Lazdane, Diane Cooper, Simukai Shamu, Peter Gichangi, Sónia Dias, Hazel Barrett, Anne Nobels (UGent), Kaiyan Pei, Anna Galle (UGent), Tammary Esho, Lucia Knight, Hanani Tabana, Olivier Degomme (UGent)**Opportunities for linking research to policy : lessons learned from implementation research in sexual and reproductive health within the ANSER network** (2018)
- Vermandere H, Galle A, Griffin S, de Melo M, Machaieie L, Van Braeckel D, et al. **The impact of facility audits, evaluation reports and incentives on motivation and supply management among family planning service providers: an interventional study in two districts in Maputo Province,** Mozambique. BMC Health Services Research (17).2. Impactfactor 1.8.
- Lenka Benova et al. (2020). On behalf of the MATCO working group: team member Anna Galle. A call to action: Documenting and sharing solutions and adaptations in sexual, reproductive, maternal and newborn health care provision during the COVID-19 pandemic, Sexual and Reproductive Health Matters,

OTHER OUTPUT

- Film production "The Pregnancy is Ours" (https://projectsag.weebly.com/) based on a participatory action research project.
- Duo Photo Exhibition "Motherhood" in Belgium and Mozambique to promote women's rights during childbirth (https://projectsag.weebly.com/).

7.4 Appendix 4: English Summary

Maternal health is a constant concern in Mozambique, as the nation's maternal mortality rate (MMR) is still one of the highest in the world. The latest numbers from 2017 indicate a MMR of 289 maternal deaths per 100 000 livebirths[130]. On a more positive note, significant progress has been made in the country in encouraging women to deliver in health facilities, with a nationwide institutional delivery rate of 70% [113]. In line with global strategies, efforts in Mozambique have largely focused on increasing antenatal care (ANC) coverage and facility-based childbirth together with improving access to family planning services during the Millennium Development Goals era as key mechanisms to reduce perinatal and maternal mortality [10, 11]. More recently, maternal health efforts are shifting from an emphasis on boosting service utilisation to improving quality of care, because poor quality of care in health care settings seem to compromise the expected health gains of the increased antenatal care coverage and institutional delivery rates[274]. Quality issues have shown to be aggravated by inequities and evidence suggests that especially poor and marginalized women (e.g. adolescents and single women) may encounter disrespectful or abusive care, affecting the overall quality of care [14, 15]. In addition men's important role in improving maternal health care utilisation has been receiving more attention over the last decade, in the belief that male involvement in maternal health can contribute to the reduction of maternal and infant mortality[54, 47]. Also in Mozambique men have been encouraged to be involved in maternal health care by different interventions, such as sending invitation letters to attend antenatal care, giving priority to couples and different community campaigns[144, 275]. Nevertheless evidence on the role of men in maternal health and effective interventions for increasing male involvement remains scarce in Mozambique

Within this context this dissertation overall aim was to examine the role of the male partner in southern Mozambique during pregnancy and childbirth and assess barriers and facilitators for the successful involvement of men. However, this assessment could not be done without also examining the broader context of maternal health care provision in Mozambique. Preliminary findings demonstrated how quality of care issues and the occurrence of disrespectful treatment hampered the engagement of men in maternal health. As a consequence the objectives of this doctoral thesis were expanded by also assessing the implementation of respectful maternity care in southern Mozambique. Lastly the concept of male involvement in maternal health was also examined from a global perspective, based on the perceived gap in the literature regarding a clear definition and operationalisation of

the concept.

The first aim of this thesis was to assess the implementation of respectful maternity care in southern Mozambique, including the role of the male partner. Our second aim was to assess the role of the male partner during pregnancy and childbirth in southern Mozambique and explore barriers for male involvement. As third aim I explored the conceptualisation of male involvement in maternal health from a global perspective. To answer the research questions and study objectives of this dissertation, several data-collection methods and data sources were used, namely quantitative surveys, in depth individual interviews, focus group discussions, a systematic review of the literature and a Delphi study. Every aim of our research was explored by a mix of qualitative and quantitative data and examined by a mixed method approach. Findings of this doctoral dissertation have been published in six peer-reviewed articles.

The first paper , "Disrespect and abuse during facility-based childbirth in southern Mozambique: a cross-sectional study." , showed that the occurrence of disrespectful treatment is common in southern Mozambique, although the prevalence of certain forms of abuse such a physical violence and bribing were rather low compared to the neighbouring countries. I also found that the occurrence of disrespect and abuse was much higher in the district hospitals compared to the referral hospitals, emphasizing the high need for tailored interventions according to the severity of the problem and specific context. While male birth companions are not allowed in public facilities, women seem in favour of involving their partners. With the ideal conditions (such as infrastructure allowing privacy and trained providers) the invitation of male birth companions could be explored in the future, with the potential of improving women and their partners' experience of care.

The second paper, "A qualitative study on midwives' identity and perspectives on the occurrence of disrespect and abuse in Maputo city.", revealed midwives are struggling with their low position in the health system hierarchy, which might be a trigger for disrespectful treatment of women during childbirth. In addition midwives did not seem adequately trained to handle stressful emergency situations and risk to conduct disrespectful behaviour when an obstetric emergency occurs. However, in my study I could not identify an intentional abuse by providers, making terms such as obstetric violence and abuse misplaced in this context. Supportive supervision and avoiding a blaming culture seems key for mitigating disrespect in health facilities, together with an increased respect for midwives (both by society and within the health system). The positive views of midwives on continuous labour companionship and inviting male partners as birth companions are promising for future quality improvements initiatives in that aspect of care.

The third paper, "Policymaker, health provider and community perspectives on male involvement during pregnancy in southern Mozambique: a qualitative study." , showed men are willing to take up a supportive role during pregnancy and childbirth and consider it as their responsibility to "take care" . However, persistent gender inequality in- and outside the health facility hamper successful implementation of male involvement programs. In addition I observed a long standing association of men attending ANC services with being HIV positive, which was a serious barrier for male presence at ANC in southern Mozambique. Overall an increased focus on supply side barriers (by more male friendly services and gender sensitive consultations) might be needed for improving male involvement in maternal health in southern Mozambique. Lastly I found that male involvement programs should also focus on other aspects of men's role during pregnancy and childbirth than ANC presence and HIV testing, for avoiding HIV stigmatisation and improving not only maternal health outcomes but also broader outcomes such as gender equality.

The fourth paper, "A cross-sectional study of the role of men and the knowledge of danger signs during pregnancy in southern Mozambique." showed men take part in decisions concerning maternal health and are often providing financial support related to maternal health care issues. I found that maternal health care knowledge was equally low among men and women and that male attendance at ANC (at least once in the last pregnancy) was reported to be 30% . However, the latter should be interpreted with caution as male attendance at ANC is interpreted differently by different actors (waiting at the gate is often also considered as male attendance). Surprisingly, communication with the partner was associated with higher maternal health knowledge among men and women, while presence at ANC was not. These findings let me conclude that the quality of ANC should be improved for optimising maternal health care provision, whereby counselling of men and women regarding birth preparedness and knowledge of danger signs takes a central place. In addition improving and facilitating communication between men and women about maternal health care issues might be an important intervention strategy to improve male involvement and maternal health outcomes.

The fifth paper, "A systematic review of the concept "male involvement in maternal health" by natural language processing and descriptive analysis." showed that the conceptualisation of male involvement in maternal health in the literature is done by focusing on either the psychosocial aspects of support or men's role in maternal health care utilisation. Overall male involvement was most often measured by instrumental actions such as presence at health services, financial support or providing transport. Other aspects of male involvement, such as communication, emotional support and shared decision making have received little attention, espe-

cially in low- and middle-income countries. Based on those findings I recommend more research into those neglected aspects of male involvement (such as the subjective feeling of perceived support and shared decision making) to broaden the potential of male involvement programs and also reveal and minimize potential negative side-effects of male involvement interventions.

In the last paper, "Towards a global framework for assessing male involvement in maternal health: results of an international Delphi study", a team of global experts reached a consensus regarding a global male involvement framework, consisting of five categories: involvement in communication, involvement in decision making, practical involvement, physical involvement and emotional involvement. The strong consensus reached in this study around a global framework for assessing male involvement in maternal health provides a platform for further optimisation of the proposed indicators (based on pilot testing in different countries) and an opportunity for improved monitoring and reporting of effectiveness of male involvement interventions at a global level. However, further research is needed to explore how couple dynamics (such as shared decision making, women's empowerment and gender equality) can be optimally assessed within male involvement interventions.

In conclusion, this dissertation has revealed the complexity of involving men in maternal health care, together with the challenges of providing respectful maternity care in a low-income setting. I found that the provision of respectful maternity care and the involvement of men seem to be hampered by mainly the same challenges, being privacy issues, limited training of health providers and a high workload. In addition there is a persistent gender inequality within society and the health system, negatively affecting how midwives are treated in the health system hierarchy, but also negatively affecting women's role in the consultation when they are accompanied by a partner. My findings suggest a "one fits all" approach for involving men into maternal health will hardly work, and that every strategy will have his limitations. The promotion of gender-equitable relationships into every male involvement strategy is key for limiting negative side-effects of male involvement. Unintended (negative) side-effects of male involvement programs are hardly documented in the literature and should be assessed and explored more often.

Based on these findings I made some key recommendations for policy and practice in Mozambique:

-The practice of giving priority to couples should be revised to avoid the reinforcement of gender inequality at the health system level.

-The infrastructure of the facilities and skills of the health providers need to be improved in order to minimise supply-side barriers for male involvement in mater-

nal health. Offering high quality antenatal care for both the woman and partner is key for the successful involvement of men in maternal health.

-Improving midwives' working environment in terms of constructive supervision and promoting positive gender equal relationships with patients, colleagues and superiors has the potential of improving overall maternal health care and reducing disrespectful treatment towards women during childbirth.

-Integration of gender equality interventions into male involvement programming is key for improving maternal health together with broader outcomes on the long term.

At a global level I believe a broader holistic scope, involving a multidimensional assessment in male involvement interventions, might give more sustainable results on maternal health and broader health outcomes than narrowly focused interventions. In addition more realist evaluations of male involvement programs are needed , especially in LMICs were the conditions of intervention programs can often not be replicated over the whole country due to limited resources. The global framework for assessing male involvement in maternal health provides an opportunity for improved monitoring and reporting of male involvement interventions at a global level and can facilitate ongoing efforts to broaden the evidence base regarding male involvement in maternal health.

7.5 Appendix 5: Nederlandstalige Samenvatting

De gezondheid van moeders verbeteren blijft een prioriteit in Mozambique, aangezien het nationale maternale sterftecijfer nog steeds één van de hoogste ter wereld is. Maternaal overlijden wordt gedefinieerd als “de dood van een vrouw tijdens haar zwangerschap of binnen de 42 dagen na het beëindigen van de zwangerschap, ongeacht de duur of de lokalisatie van de zwangerschap, door iedere oorzaak gerelateerd aan of verergerd door de zwangerschap of haar gevolgen of behandeling; overlijden door ongeval of andere incidentele oorzaken zijn uitgezonderd”. De laatste cijfers uit 2017 gaven aan dat de moedersterfte 289 per 100.000 levendgeborenen bedraagt in Mozambique. Het positieve nieuws is dat er enorme vooruitgang is geboekt op het vlak van het aantal bevallingen in een gezondheidsinstelling, met momenteel rond de 70

De algemene doelstelling van deze thesis was het onderzoeken van de rol van de mannelijke partner tijdens zwangerschap en bevalling in het zuiden van Mozambique en het effect op gezondheidsuitkomsten. Dit onderzoek kon echter niet gebeuren zonder ook de bredere context van de gezondheidszorg voor moeders in Mozambique in kaart te brengen. Voorlopige bevindingen aan de start van het doctoraatstraject toonden aan hoe problemen met de kwaliteit van de zorg, en vooral een tekort aan respect tijdens de zorg, de betrokkenheid van mannen belemmerden. De doelstellingen van dit doctoraatsproefschrift werden dan ook uitgebreid en er werd ook onderzocht of de moederzorg plaatsvond met respect voor de vrouw en haar omgeving. Tot slot werd op basis van de ondervonden lacune in de literatuur met betrekking tot een duidelijke definitie en operationalisering van het concept "de betrokkenheid van mannen bij de moederzorg", een onderzoek uitgevoerd naar de invulling van dit concept vanuit een globaal perspectief.

Het eerste artikel, “Disrespect and abuse during facility-based childbirth in southern Mozambique: a cross-sectional study.” , toonde aan dat het onrespectvol behandelen van vrouwen tijdens de bevalling veel voorkomt in het zuiden van Mozambique. De prevalentie van bepaalde vormen van misbruik en omkoping in Mozambique waren echter laag in vergelijking met de buurlanden. We ontdekten ook dat het optreden van gebrek aan respect en misbruik in de zorg veel hoger was in de districtsziekenhuizen dan het verwijzingsziekenhuis, wat de grote nood aantoont van specifieke interventies aangepast aan het probleem en de context. Onze studie toonde aan dat mannelijke partners niet zijn toegestaan bij de bevalling in openbare gezondheidsinstellingen, maar dat vrouwen er toch voorstander van zijn hun partners erbij te betrekken. Onder ideale omstandigheden (zoals infrastructuur die privacy mogelijk maakt en getrainde zorgverleners) zou het toelaten van

mannelijke geboortepartners in de toekomst kunnen worden onderzocht.

Het tweede artikel, “A qualitative study on midwives’ identity and perspectives on the occurrence of disrespect and abuse in Maputo city.” , onthulde dat vroedvrouwen worstelen met hun lage positie in de hiërarchie van het gezondheidssysteem, wat een trigger kan zijn voor een respectloze behandeling van vrouwen tijdens de bevalling. Bovendien leken vroedvrouwen niet voldoende opgeleid om met stressvolle situaties om te gaan in het verloskwartier. Een obstetrische noodsituatie was dan ook een risicofactor voor het onrespectvol behandelen van vrouwen tijdens de bevalling. In ons onderzoek hebben we echter geen opzettelijk misbruik door vroedvrouwen opgemerkt waardoor termen als obstetrisch geweld en misbruik in deze context misplaatst zijn. Ondersteunende supervisie en het vermijden van een beschuldigende cultuur lijken essentieel om het gebrek aan respect voor parturiënten in gezondheidsinstellingen te verminderen, samen met een groter respect voor vroedvrouwen (zowel in de samenleving als binnen het gezondheidssysteem). De positieve attitude van vroedvrouwen over continue steun van een persoonlijke begeleider (of geboortepartner) tijdens de bevalling en het eventueel toelaten van mannelijke partners zijn veelbelovend voor toekomstige kwaliteitsverbetering in dat aspect van de zorg.

Het derde artikel, “Policymaker, health provider and community perspectives on male involvement during pregnancy in southern Mozambique: a qualitative study.” , toonde aan dat mannen bereid zijn een ondersteunende rol op zich te nemen tijdens zwangerschap en bevalling en het ook als hun verantwoordelijkheid beschouwen. Aanhoudende ongelijkheid tussen mannen en vrouwen binnen en buiten de gezondheidsinstelling belemmeren echter de succesvolle implementatie van programma’s die mannen willen betrekken. Bovendien stelden we diepgewortelde associaties vast van mannen die aanwezig zijn tijdens prenatale consultatie met HIV positief zijn, wat een ernstige belemmering vormde voor de aanwezigheid van mannen bij prenatale zorg in het zuiden van Mozambique. In het algemeen zou meer aandacht moeten worden besteed aan de problemen aan de kant van de aanbodzijde door meer manvriendelijke zorg en oog voor gendergelijkheid tijdens de consultatie. Op die manier kan de betrokkenheid van mannen bij de gezondheid van moeders in het zuiden van Mozambique verbeteren. Ten slotte zijn we ervan overtuigd dat programma’s zich ook moeten richten op ruimere aspecten van mannelijke betrokkenheid dan aanwezigheid tijdens de prenatale zorg en het testen van HIV. Deze verschuiving is nodig om HIV-stigmatisering te voorkomen en ook bredere resultaten te beogen zoals meer gendergelijkheid.

Het vierde artikel, “A cross-sectional study of the role of men and the knowledge of danger signs during pregnancy in southern Mozambique.” , heeft aangetoond dat mannen deelnemen aan beslissingen over de gezondheid van moeders en vaak

financiële steun verlenen voor toegang tot maternale gezondheidszorg. We stelden echter vast dat de gezondheidskennis bij moeders even laag was als bij hun mannelijke partners en dat het aantal mannen dat meeging naar de prenatale consultatie (minstens één keer tijdens de laatste zwangerschap) 30% bedroeg. Dit laatste moet echter met de nodige voorzichtigheid worden geïnterpreteerd, aangezien "meegaan naar de consultatie" door verschillende actoren verschillend wordt geïnterpreteerd. Wachten aan de ingang wordt bijvoorbeeld ook vaak beschouwd als meegaan. Verrassend genoeg was communicatie met de partner geassocieerd met een hogere kennis over gezondheidskwesties (gerelateerd aan de gezondheid van de moeder) bij mannen en vrouwen, terwijl er geen link was met het al dan niet meegaan naar de prenatale zorg. Deze bevindingen laten ons concluderen dat de kwaliteit van prenatale zorg verbeterd moet worden. Mannen en vrouwen zouden optimaal voorbereid moeten worden op de geboorte door ook kennis te vergaren in verband met risicosignalen. Bovendien zou het verbeteren en faciliteren van de communicatie tussen mannen en vrouwen over maternale gezondheidszorgkwesties moeten worden onderzocht als interventiestrategie om de betrokkenheid van mannen te verbeteren.

Het vijfde artikel, "A systematic review of the concept "male involvement in maternal health" by natural language processing and descriptive analysis." , toonde aan dat de conceptualisering van de betrokkenheid van mannen bij de gezondheid van moeders in de literatuur gebeurt door enerzijds te focussen op de psychosociale aspecten van zijn hun betrokkenheid of anderzijds op zijn hun rol bij het gebruik van de gezondheidszorg door moeders. De betrokkenheid van mannen werd het vaakst gemeten aan de hand van instrumentele acties zoals aanwezigheid bij de consultaties, financiële steun of het voorzien van vervoer. Andere aspecten van de betrokkenheid van de partner, zoals communicatie, emotionele steun en gedeelde besluitvorming zijn in veel mindere mate onderzocht in de literatuur, vooral in lage- en middeninkomenslanden. Op basis van deze bevindingen bevelen we meer onderzoek aan naar deze aspecten van mannelijke betrokkenheid. Zo is ook het subjectieve gevoel van het ervaren van steun en gedeelde beslissingen belangrijk bij het betrekken van mannen. Bovendien kan door een bredere benadering ook rekening gehouden worden met mogelijke negatieve bijwerkingen van mannelijke betrokkenheid en getracht worden deze te minimaliseren.

In de laatste paper, "Towards a global framework for assessing male involvement in maternal health: results of an international Delphi study", kwam een team van wereldwijde experts tot een consensus over een globaal kader voor het meten van de rol van de mannelijke partner bij de moedergezondheid, bestaande uit vijf categorieën: betrokkenheid bij communicatie, betrokkenheid bij het nemen van beslissingen, praktische betrokkenheid, fysieke betrokkenheid en emotionele be-

trokkenheid. Dit globaal kader biedt een platform voor verdere optimalisatie van de voorgestelde indicatoren (op basis van pilootprojecten in verschillende landen) en een kans voor betere monitoring en rapportage van de effectiviteit van interventies op globaal niveau. Men moet ook verder onderzoeken hoe de verschillende aspecten van de relatie tussen het koppel (zoals gedeelde beslissingen, empowerment van vrouwen en gendergelijkheid) optimaal in kaart kunnen worden gebracht binnen interventies voor mannelijke betrokkenheid.

Als conclusie heeft deze thesis de complexiteit blootgelegd van het betrekken van mannen bij de gezondheidszorg voor moeders, samen met de uitdagingen van het bieden van respectvolle zorg in een laag-inkomensland. We ontdekten dat het aanbieden van respectvolle zorg tijdens de zwangerschap en bevalling en de betrokkenheid van mannen worden belemmerd door voornamelijk dezelfde factoren, namelijk privacyproblemen, beperkte opleiding van zorgverleners en een hoge werkdruk. Bovendien is er een aanhoudende genderongelijkheid binnen de samenleving en binnen het gezondheidssysteem, wat een negatieve invloed heeft op de manier waarop vroedvrouwen worden behandeld in de hiërarchie van het gezondheidssysteem. Deze genderongelijkheid heeft bovendien ook een negatieve invloed op de rol van vrouwen tijdens de prenatale consultatie wanneer ze worden vergezeld door een partner. Onze bevindingen suggereren dat een 'one-fits-all'-benadering om mannen te betrekken bij de gezondheid van moeders niet kan werken, en dat elke strategie zijn beperkingen heeft. Het bevorderen van gendergelijke relaties in elke strategie voor mannelijke betrokkenheid is noodzakelijk voor het beperken van negatieve gevolgen. Onbedoelde (negatieve) bijwerkingen van programma's gericht op het betrekken van mannen zijn nauwelijks gedocumenteerd in de literatuur en zouden vaker onderzocht moeten worden.

Op basis van onze bevindingen hebben we enkele belangrijke aanbevelingen gedaan voor beleid en praktijk in Mozambique:

-De gewoonte om voorrang te geven aan koppels tijdens de prenatale consultatie moet worden herzien om te voorkomen dat de ongelijkheid tussen mannen en vrouwen in de gezondheidszorg wordt versterkt.

-De infrastructuur van de faciliteiten en vaardigheden van de zorgverleners moeten worden verbeterd om de belemmeringen aan de aanbodzijde voor het betrekken van mannen bij de gezondheid van moeders tot een minimum te beperken.

-Het bieden van hoogwaardige prenatale zorg voor zowel de vrouw als de partner is essentieel voor de succesvolle betrokkenheid van mannen bij de gezondheid van moeders.

-Het verbeteren van de werkomstandigheden van vroedvrouwen op het gebied van

ondersteunde supervisie en het bevorderen van gendergelijkheid in de omgang met patiënten, collega's en leidinggevenden kan de zorg voor moeders verbeteren en de respectloze behandeling van vrouwen tijdens de bevalling verminderen.

-Interventies rond gendergelijkheid moeten worden geïntegreerd in de programma's gericht op het betrekken van mannen bij de moederzorg.

Vanuit een globale context geloven we dat een bredere holistische aanpak in programma's gericht op het betrekken van mannen bij de moedergezondheid meer duurzame resultaten kan opleveren dan zeer nauw gefocuste interventies. Bovendien zijn meer realistische evaluaties van programma's voor mannelijke betrokkenheid nodig, vooral in lage en middeninkomen landen waar vanwege de beperkte middelen de originele interventie vaak niet kan worden geïmplementeerd over het hele land. Ons globaal kader voor het in kaart brengen van de betrokkenheid van mannen bij de gezondheid van moeders biedt een mogelijkheid voor een betere monitoring en rapportage van interventies voor mannelijke betrokkenheid op globaal niveau en kan de groeiende wetenschappelijke basis met betrekking tot de betrokkenheid van mannen bij de gezondheid van moeders verbreden.

7.6 Appendix 6: Contribution of the doctoral student to the manuscripts

Personal contribution of the doctoral student to the manuscripts and publications.

1) Galle A, Manaharlal H, Griffin S, Osman N, Roelens K, Degomme O. **A qualitative study on midwives'identity and perspectives on the occurrence of disrespect and abuse in Maputo city.** BMC PregnancyChildbirth. 2020 Oct 19;20(1):629. doi: 10.1186/s12884-020-03320-0. PMID: 33076861; PMCID:PMC7569757.

   A1- Impact factor: 2.587
   Authors' contributions: AG developed the data collection instrument, supervised data collection and drafted the manuscript. HM assisted in conducting the FGDs, transcription, coding and data analysis. OD, KR, SG and NO assisted in data analysis and interpretation of the results. All authors revised the manuscript critically and read and approved the final manuscript.

2) Galle, A., De Melo, M., Griffin, S., Osman, N., Roelens, K., & Degomme, O. (2020). **A cross-sectionalstudy of the role of men and the knowledge of danger signs during pregnancy in southernMozambique.** BMC PREGNANCY AND CHILDBIRTH, 20. https://doi.org/10.1186/s12884-020-03265-4

   A1- Impact factor: 2.587
   Authors' contributions: AG developed the data collection instrument, supervised data collection and drafted the manuscript. MDM assisted in developing the data collection instruments and supervision of data collection. OD, KR, SG and NO assisted in data analysis and interpretation of the results. All authors revised the manuscript critically and read and approved the final manuscript.

3) Galle A, Manaharlal H, Cumbane E, Picardo J, Griffin S, Osman N, et al. **Disrespect and abuse duringfacility-based childbirth in southern Mozambique : a cross-sectional study.** BMC PREGNANCY ANDCHILDBIRTH. 2019;19(1).

   A1- Impact factor: 2.587
   Authors' contributions: AG developed the study protocol, collected data and drafted the manuscript. HM, EC and JP assisted in developing the data collection instruments and data collection. OD, KR, SG and NO assisted in data analysis and interpretation of the results. All authors revised the manuscript critically and read and approved the final manuscript.

4) Galle A, Cossa H, Griffin S, Osman N, Roelens K, Degomme O. **Policymaker, health provider andcommunity perspectives on male involvement during pregnancy in southern Mozambique: aqualitative study.** BMC PREGNANCY AND CHILDBIRTH. 2019;19.

A1- Impact factor: 2.587

Authors' contributions: AG developed the study protocol, collected data and drafted the manuscript. HC assisted in data collection and analysis. OD, KR, SG and NO assisted in data analysis and interpretation of the results. All authors revised the manuscript critically and read and approved the final manuscript.

5) Galle, A., Plaieser, G., Van Steenstraeten, T., Griffin, S., Osman, N., Roelens, K., Degomme, O. **A systematic review of the concept "male involvement in maternal health" by natural languageprocessing and descriptive analysis.**BMJ Global Health 2021

A1- Impact factor: 4.28

Authors' contributions: AG conceptualised the study and lead the process of reviewing the literature. GP and TVS screened articles and contributed to data extraction. AG conducted all analysis under supervision of ODG. All authors contributed to the development of the manuscript and read and approved the final version. The corresponding author attests that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted.

6) Galle, A., Plaieser, G., Van Steenstraeten, T., Griffin, S., Osman, N., Roelens, K., Degomme, O. **Towards a global framework for assessing male involvement in maternal health: results of an international Delphi study.**

Authors' contributions: AG conceptualised the study and lead data collection and analysis. All authors gave input on the initial list of indicators and SG and ODG contributed to the development of the online survey. All authors read and approved the final version of the manuscript. The corresponding author attests that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted.

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