BMJ Open

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Journal:	*BMJ Open*
Manuscript ID	bmjopen-2020-038871
Article Type:	Original research
Date Submitted by the Author:	27-Mar-2020
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Keywords:	Clinical audit < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Quality in health care < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, PUBLIC HEALTH

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Mitigating the mistreatment of childbearing women: Evaluation of respectful maternity care intervention in Ethiopian hospitals

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Abstract

Objectives: There is a lack of evidence on approaches to mitigating mistreatment during facility-based childbirth. This study compares the experiences of mistreatment reported by childbearing women before and after implementation of a respectful maternity care intervention.

Design: A pre-post study design was undertaken to quantify changes in women's experiences of mistreatment during facility-based childbirth before and after the respectful maternity care intervention.

Intervention: A respectful maternity care intervention was implemented in three hospitals in southern Ethiopia between December 2017 and September 2018 and it included training of service providers, placement of wall posters in labour rooms, and post-training supportive visits for quality improvement.

Outcome measures: A 25-item questionnaire asking women about mistreatment experiences was administered to 388 women (198 in the pre-intervention, 190 in the post-intervention). The outcome variable was the number of mistreatment components experienced by women, expressed as a score out of 25. Multilevel mixed-effects Poisson modelling was used to assess the change in mistreatment score from pre-to post-intervention periods.

Results: The number of mistreatment components experienced by women was reduced by 18% when the post-intervention group was compared with the pre-intervention group (adjusted regression coefficient (Aβ)=0.82, 95%CI: 0.74-0.91). Women who had a complication during pregnancy (Aβ=1.17, 95%CI: 1.01-1.34) and delivery (Aβ=1.16, 95%CI: 1.03-1.32) experienced a greater number of mistreatment components. On the other hand, women who delivered by caesarean delivery after trial of vaginal delivery (Aβ=0.76, 95%CI: 0.63-0.92) and caesarean delivery without trial of vaginal delivery (Aβ=0.68, 95%CI: 0.47-0.98) experienced a lesser number of mistreatment components compared to those who had vaginal delivery.

Conclusions: Women reported significantly fewer mistreatment experiences during childbirth following implementation of the intervention. Given the variety of factors that lead to mistreatment in health facilities, interventions designed to mitigate mistreatment need to involve structural changes.

Keywords: mistreatment, respectful maternity care, intervention, pre-intervention, post-intervention

Strengths and limitations of this study

- This is the first study to test the effectiveness of a respectful maternity care intervention in Ethiopia, thus contributing to evidence for further endeavours in the field.
- Comparing the counts of mistreatment components women experienced captures the diversity of mistreatment that would not have been possible to identify by simple prevalence measures.
- Treating hospitals as random-effects in the analysis controls for the impact of other interventions that may have happened around the same time as the study intervention.
- Mistreatment components experienced by women repeatedly were counted only once. This ignores multiple incidents of the same mistreatment component.
- An exit survey of women is prone to recall bias in acquiring data on multiple incidents of mistreatment that would have been minimised by labour observation.

Introduction

Despite the remarkable decline in maternal mortality worldwide, around 800 women die each day due to preventable conditions that emerge in the course of pregnancy and childbirth.[1] According to the World Health Organization's (WHO) estimates, 303,000 maternal deaths occurred in 2015, of which 3.6% occurred in Ethiopia.[1] Low utilization of maternal health care services, especially care during childbirth, is a key challenge to reducing maternal mortality.[2, 3] In 2015, only 26% of women delivered in health facilities in Ethiopia.[4]

Women's negative experiences and/or other women's negative experiences of facility-based childbirth are commonly reported reasons for not attending a health facility at the time of delivery.[5-8] These experiences include hostile or insensitive staff[7], disallowance of birth companions[6, 7], disrespectful care[9-11], women's lack of autonomy[8], poor reception at health facilities[6], lack of privacy[6, 7], unfriendly staff[12], abusive care[12], and poor readiness of health facilities.[12] The attitudes, actions and system barriers that contribute to such negative experiences are nowadays labelled as mistreatment or disrespect and abuse. However, an internationally agreed definition of mistreatment or disrespect and abuse still lacks as behaviours that are acceptable to women in some contexts may be unacceptable to women in different contexts.

There is compelling evidence from many countries on the negative impact of mistreatment on the uptake of facility-based childbirth. An evidence synthesis of studies from 16 low and middle-income countries (LMICs) and China revealed that mistreatment during childbirth is a powerful deterrent to facility-based childbirth.[13] Additionally, studies from Afghanistan[14], Bolivia[15], Ghana[16], Kenya[17, 18], Tanzania[19], Malawi[20], and India[21] have clearly reported disrespectful care at birth as a key deterrent to facility-based childbirth.

The body of knowledge on mistreatment is still emerging and evolving, hence methodological approaches to estimate levels of mistreatment differ across settings, thereby making

comparison challenging.[22, 23] Prevalence studies conducted in different parts of Ethiopia between 2013 and 2017 report many examples of mistreatment ranging from non-consented care, non-confidential care, discriminatory care, abandonment of care, non-dignified care, to physical abuse during facility-based childbirth.[24-28]

The 2014 WHO statement, which condemns all forms of mistreatment during facility-based childbirth, identifies five actions to prevent and eliminate mistreatment globally. The statement calls for: evidence synthesis on the effectiveness of interventions that aim to improve respectful maternity care and thereby mitigate mistreatment, defining and measuring mistreatment, and inculcating service providers with the culture of respectful care at the time of birth.[29] Following this, various studies, including a multi-country study led by WHO, have been conducted to review and synthesize methodological frameworks for research on mistreatment.[13, 22, 23, 30-32] However, implementation research to assess the effectiveness of interventions to halt mistreatment have not been reported in Ethiopia.

In the move towards mitigating mistreatment, a focus on respectful maternity care is growing globally, and the 'Universal Rights of Childbearing Women' has been endorsed in several countries.[33] WHO defines respectful maternity care as "the 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".[34]

With the aim of meeting the maternal mortality targets of the Sustainable Development Goals (SDG), strategies for ending preventable maternal mortality were introduced in 2015. The strategy calls for health systems not to neglect respectful maternity care while endeavouring to deliver effective clinical interventions.[35] WHO's framework for quality maternal and newborn health care reinforces the important role of respectful maternity care, and identifies respect and preservation of dignity as one of the eight domains of quality of care.[36] Additionally, in 2018, WHO released guidelines for a positive childbirth experience which recommend respectful

maternity care throughout labour and birth for all women.[34] A recent WHO paper published on the lancet that found high levels of mistreatment in four countries also highlighted the need for an urgent action to promote the provision of respectful maternity care worldwide.[37]

The government of Ethiopia launched a national movement entitled “the caring, respectful, and compassionate (CRC) health workforce” in 2016. The initiative is one of the four health sector transformation agendas aiming to achieve health targets set for the five years between 2015/16 – 2020/21.[38] However, respectful maternity care initiatives are in early-stage development and currently limited to a few pilot health facilities and technically supported by international partner organizations. Consequently, there is an evidence gap regarding implementation of effective respectful maternity care interventions in the country.

This study was undertaken to assess women’s experiences of mistreatment during facility-based childbirth before and after implementation of an intervention that was designed to improve the quality of care women receive during childbirth in hospitals. Previous respectful maternity care intervention studies from Kenya[39] and Tanzania[40, 41] revealed a significant reduction in the level of mistreatment and an improved attitude of service providers towards women, as a consequence of the interventions. This study is part of a broader interventional mixed methods study that aimed to identify health system challenges to the implementation of RMC and potential solutions to address these challenges. Lessons drawn from the respectful maternity care training and its implementation[42] and health system constraints to the promotion of respectful maternity care in Ethiopian hospitals[43] are reported elsewhere. To our knowledge, this study is the first to report on the effectiveness of a respectful maternity care intervention in Ethiopia. The study findings add weight to the emerging evidence base on respectful maternity care, and will be used to inform planning and decision making concerning maternal health and other related services in Ethiopia.

Materials and methods

Study setting

This study was undertaken in three hospitals located in the Southern Nations Nationalities and Peoples Region (SNNPR), Ethiopia. Health services in Ethiopia are organized in three tiers: health posts, health centres, and primary hospitals are in the first tier; the second tier consists of general hospitals; and the third tier, specialized hospitals.[38] In principle, general hospitals are designed to serve a catchment population of 1-1.5 million people whereas primary hospitals are expected to serve 60,000 - 100,000 people. One of the study hospitals, Leku, is a primary hospital reported to be serving a catchment population of 286,149 including an estimated 8000 women who give birth each year. The other two hospitals, Adare and Yirgalem, are general hospitals serving a catchment population of 341,659 and 261,293, respectively. An estimated 10,000 and 9,000 pregnant women give birth each year in the catchments of Adare and Yirgalem hospitals, respectively.

Study design

This study is part of a mixed-methods implementation research study that was conducted to identify health system constraints to the promotion of respectful maternity care and to develop and assess mitigation approaches. A pre-post study that involved no comparison group was undertaken between December 2017 and September 2018 to quantify changes in women's experiences of mistreatment during facility-based childbirth. Women who delivered in the study hospitals were surveyed at the time of discharge; the pre-intervention surveys were conducted in March 2018, whereas the post-intervention surveys were conducted in July and August 2018.

Description of the intervention

The intervention included: training of service providers, placement of wall posters in labour rooms, and post-training supportive visits for quality improvement. Each of these are described below.

The training of service providers involved a three-day workshop using a respectful maternity care training manual developed for this intervention. The manual was drafted by maternal health researchers from Ethiopia and Australia after review of previous respectful maternity care

training manuals designed for low-income settings (Kenya[44], Tanzania[45], and Nigeria[46]), international human rights declarations[33, 47, 48], national professional codes of ethics, and national training manuals on maternity care and quality improvement. The manual includes an overview of maternal health in Ethiopia. It covers topics such as human rights and law in the context of reproductive health, respectful maternity care rights and standards, professional ethics, and continuous quality improvement. The draft manual was reviewed by three senior maternal health experts at the Federal Ministry of Health and SNNPR Health Bureau for its content and applicability in the Ethiopian context. Two rounds of three-day respectful maternity care training sessions were conducted at Hawassa University Comprehensive Specialized Teaching Hospital. The training was interactive and deployed various teaching methods including presentations, role plays, demonstrations, case studies, individual readings, video shows, and a hospital visit. Training sessions were facilitated by the principal investigator, a senior maternal health expert from the SNNPR health bureau, and a senior obstetrician-gynaecologist. A total of 64 health service providers participated in the training, 33 in the first round and 31 in the second round (all were staff from the participating hospitals). Fifty-two were midwives whereas the remaining were integrated emergency surgical officers (4), general practitioners (3), nurses (3), and health officers (2). The SNNPR health bureau and hospital administrations communicated their expectation that all service providers at the participating hospitals who assist women during childbirth should attend the training. In reality, all eligible service providers from Adare (26) and Leku (21) hospitals attended the training sessions. Five among the 22 eligible service providers from Yirgalem hospital did not attend the training sessions for personal reasons.

Five types of wall posters (four in English and one in Amharic) were distributed to the hospitals following completion of the service provider training. The posters were displayed in labour wards and waiting rooms to serve as job aids for service providers who are trained in English to become health professionals and who generally use service guidelines and reporting formats prepared in English. One of the English version wall posters lists the universal rights of

childbearing women prepared by the White Ribbon Alliance[33] whereas the remaining three are infographics taken from the intrapartum care for a positive childbirth experience guideline prepared by the World Health Organization[34] [Supplementary file 1]. The Amharic version poster described the manifestations of mistreatment during facility-based childbirth and the universal rights of childbearing women endorsed by the Federal Ministry of Health, Ethiopia [Supplementary file 1].

Two rounds of post-training quality improvement supportive supervision visits were conducted by the principal investigator and a senior maternal health expert in all hospitals at two-week intervals, in June and July of 2018. During the initial visit, a facility-led assessment of maternity care settings was conducted using a structured checklist that was part of the health providers training [Supplementary file 2]. The checklist included 32 respectful maternity care standards that were assessed using observation, interview, and review of documents; the standards were grouped into five categories. Action plans were developed by service providers to address actionable gaps identified by the respectful maternity care standards assessment. The gaps that could not be addressed at the labour ward level were passed to hospital administrations for further actions [Supplementary file 2]. During the second visit, similar steps were undertaken to see changes as a result of the initial action plan and promote continuous quality improvement as a routine process. Detail information on the sequencing of the interventions and the timing of data collection of the broader study, including the current study, is appended [Supplementary file 3].

Participants and procedures

Pregnant women who gave birth in the study hospitals were eligible for inclusion in the study regardless of their mode of delivery (natural or operative) or birth outcome. Once women had completed their discharge requirements and procedures, they were invited to participate in the study and were consecutively enrolled until the required sample size was achieved for each study hospital.

Sample size and sampling

Stata 14 software was used to calculate the sample size for this study using the menu option for determining the difference between two sample means with the assumption of: an anticipated mean count of mistreatment experiences women face in facility-based childbirth (pre-intervention) of 4.91, taken from a study conducted in Addis Ababa[26]; an anticipated mean count of mistreatment experiences women face in facility-based childbirth (post-intervention) of 3.96 (mean difference of 0.95); statistical power of 90%; an allocation ratio of 1:1 between the pre and post-intervention groups; 0.05 level of significance; and 10% non-response rate. Additionally, women receiving care in the same hospital are more likely to receive comparable care during childbirth, so the sample size was adjusted for clustering by assuming a clustering effect of 2. With these assumptions, the minimum required sample size was calculated to be 378 (189 in the pre-intervention group and 189 in the post-intervention group). Eventually, 388 women were surveyed (190 in the pre-intervention and 198 in the post-intervention). Allocation of samples to the three hospitals was made proportionately depending on the number of women who delivered in the hospitals in the last quarter of 2017 for the pre-intervention survey, and the second quarter of 2018 for the post-intervention survey. Accordingly, 172 (87 pre-intervention, 85 post-intervention) women were surveyed from Adare hospital, whereas 86 (46 pre-intervention, 40 post-intervention) and 130 (65 pre-intervention, 65 post-intervention) were from Leku and Yirgalem hospitals, respectively. Eligible women were enrolled into the study consecutively until the required sample size was met.

Variables and outcome measures

The survey included 25 questions about women's experiences of childbirth in the study hospitals (Table 1). The questions pertained to six categories: verbal abuse; physical abuse; non-consented care; lack of information, privacy and confidentiality; neglect and discrimination; and refusal of preference. The responses consisted of dichotomized mutually exclusive options set as "yes" or "no". The outcome variable was a count variable computed from the 25 variables clustered into the categories mentioned above; the number of mistreatment components women

experienced were counted as a score out of 25; maximum possible score being 25 and minimum 0.

The main independent variable of the study was whether the woman belongs to pre-intervention group or post-intervention group, i.e. whether she was hospitalised before or after the intervention. The other independent variables, i.e. potential confounders that were considered for adjustment were: sociodemographic (place of residence, age, age at first marriage, marital status, educational status, occupation, religion, ethnicity, monthly income, number of children); obstetric characteristics (complication/s during pregnancy and delivery, type of delivery, intervention/s for vaginal delivery); service utilization history (antenatal visits, history of facility-based delivery); service-related (referral status, time of admission, hours of stay, gender of service provider)

Questionnaire development

The survey questionnaire was developed as per the recommendations of a comparative analysis of five prevalence studies of mistreatment that were conducted in sub-Saharan Africa countries, including Ethiopia.[22] Additionally, the typology suggested by a mixed-methods systematic review on mistreatment during facility-based childbirth[23] was used to refine and group the 25 questions with some modifications. The questionnaire was originally prepared in English and later translated into both Amharic and Sidamu Afo languages and back-translated to check for consistency. Subsequently, an electronic data collection template was prepared using the KoBoToolbox tool and data collection was made using the KoBoCollect app for android devices.

Data collection

Data were collected by trained nurses and midwives who were fluent speakers of both Amharic and Sidamu Afo languages, recruited from Hawassa University Comprehensive Specialized Hospital. Data collectors received detailed three-day training on the purpose of the study, contents of the questionnaire and effective and ethical survey administration. The questionnaire

was pre-tested on 15 women who delivered in Hawassa University Comprehensive Specialized Hospital which resulted in minor modifications to the questionnaire. Before conducting the post-intervention survey, data collectors received a one-day refresher training. To ensure data quality, the supervisor reviewed completed questionnaires for key contents before they were uploaded from the tablets to the server; the principal investigator cross-checked all uploaded questionnaires for consistency and completeness.

Data management and analysis

Data were exported to SPSS V.24 software for cleaning and later to StataSE v.15 software for analysis. The outcome variable, number of mistreatment components women experienced, was confirmed to follow the Poisson distribution by using a one sample independent Kolmogorov-Smirnov test ($p = 0.97$). Additionally, the mean (4.40) and variance (4.14) of the outcome variable were found to be close and thus suitable for Poisson modelling. Three models were constructed in this study: a null (intercept-only) model with the intercept as a fixed effect and random effects for hospitals (model I); a model containing the intervention as a fixed effect and random effects for hospitals (model II); and a model containing the intervention, sociodemographic, obstetric, and health service-related factors as fixed effects and random effects for hospitals (model III). The independent variables were checked for multicollinearity using the variance inflation factor (VIF). Hospital was set as a random-effects variable in all models to take into account the likely absence of independence among women who received care from the same hospital. Analysis results from model III are reported in this study. A multilevel mixed effects Poisson regression analysis was conducted to identify the association between the independent and outcome variables while adjusting for possible confounders. The fixed effects (association measures) and random effects (variation measures) for the number of mistreatment components experienced are reported. Adjusted exponentiated regression coefficients (β) with their corresponding 95% confidence intervals (CI) were used to estimate the level of association between independent variables and the outcome variable.

Patient involvement

Women who gave birth in the study hospitals during the survey periods were involved in the study. These women were not involved in research design, tool development, data analysis, and reporting.

Results

Demographics

Among the 388 women who participated in the study (198 pre-intervention, 190 post-intervention), there was no difference in the distribution of place of residence, age, age at first marriage, educational level, marital status, religion and ethnicity between the two groups (Table 2). Illiteracy was higher in the post-intervention group (20%) than in the pre-intervention group (14.7%). The proportion of women who did not have a regular monthly income was also higher in the post-intervention group (63.7%) than the pre-intervention group (55%) (p=.08). More than two thirds (70.1%) of women in the post-intervention group were housewives compared to 51% in the pre-intervention group, p<.001 (Table 2).

Obstetric characteristics

More than half of the participants in the pre-intervention (55.6%) and post-intervention (51.6%) groups were multiparous; the median number of total deliveries was two in both groups (Table 3). The majority of women delivered their previous child at a health institution, 75.2% in the pre-intervention and 70.1% in the post-intervention group. Comparable levels of women in the pre-intervention (94.9%) and post-intervention (96.8%) groups had antenatal visits during their index pregnancy; however, having three or more antenatal visits was higher among women in the pre-intervention survey (82.4% vs 71.2%; p=.04). Complications during the index pregnancy were reported by 17.2% of women in the pre-intervention group and 10% in the post-intervention group (p=.04). However, complications during delivery were not significantly different between the two groups (Table 3). Compared to women in the pre-intervention group, women in the post-intervention group were less likely to have had a vaginal delivery (77.4% vs. 87.9%, p=.01) or

an intervened vaginal delivery (39.5% vs. 46.4%, *p*=.15). Episiotomy was the most commonly reported intervention for vaginal delivery in both groups, followed by vacuum extraction and forceps delivery (Table 3).

Service characteristics

In relation to service characteristics, there was no difference between the pre- and post-intervention groups with respect to referral status and time of admission (Table 3). On the other hand, a higher proportion (52.5%) of women in the pre-intervention group delivered during the night-time than women in the post-intervention group (42.6%), *p*=.05. More than three-fifths (61.1%) of women in the pre-intervention group were assisted mainly by female service providers while the gender of service providers in the post-intervention group was almost at parity (51.6% female vs. 48.4% male) (Table 3).

Preference during childbirth

There were 86 (43.7%) women in the pre-intervention group who wanted to have a birth companion in the labour ward, while only 17.9% of women in the post-intervention group wanted to have a birth companion (p<.001). Among those women who wanted to have a birth companion in the pre-intervention group, 14% were afraid to ask service providers to have one (23.5% in post-intervention group). A higher proportion of women in the pre-intervention group wanted to adopt a preferred birthing position (34.9% vs. 19.1%, *p*<.001) and cultural practice in the labour ward (21.7% vs. 8.9%, *p*=.001) compared to the post-intervention group. More than half (51.2%) of women who wanted to have cultural practice in the pre-intervention group were afraid to ask service providers to have the practice (47.1% in post-intervention group). The proportion of women who wanted to move around during birth was did not vary significantly in the two groups (28.8% pre-intervention group vs 35.5 post-intervention group), as was the proportion of women wanting to have food or fluids during birth (35.5% pre-intervention vs 33.2% post-intervention group) (Table 4).

Experiences of mistreatment

Almost all women (99.5% pre-intervention vs 99% post-intervention group) reported experiencing at least one type of mistreatment. The number of mistreatment types experienced ranged from one to 12 in the pre-intervention group (median = 5), and one to 11 in the post-intervention group (median = 3.5).

When the pre-intervention and post-intervention groups are compared, a number of improvements in women's experiences of mistreatment are evident. For example, vaginal examination was performed without permission for 64.7% of women in the pre-intervention and 47.9% women in the post-intervention groups, *p*=.001 (Table 1). Additionally, failure of service providers to obtain women's consent before different procedures during childbirth, including surgery, was significantly lower during the post-intervention survey. Among women who wanted to have a birth companion present, 86.5% of women in the pre-intervention group and 69.2% in the post-intervention group were not allowed a birth companion (*p*=.04). However, some aspects of mistreatment did not improve significantly following the staff training. The use of harsh or rude language by health providers was reported by 4.0% and 3.2% of women in the pre-intervention and post-intervention groups, respectively. One in ten of women (9.6%) from the pre-intervention and 5.8% from the post-intervention groups reported being gagged by the service providers. Comparable levels of women were left for a prolonged period of time without attention (9.6% in the pre-intervention group and 6.3% in the post-intervention group). Additionally, more than two-thirds (67.9%) of women in the post-intervention group claimed that service providers did not give periodic updates on their labour (52.5% in the pre-intervention survey; *p*=.002).

Apart from an overall comparison of the number of mistreatment components experienced by women in the pre-intervention and post-intervention groups, we compared the proportion of women who had encountered mistreatment grouped by six categories (verbal abuse; physical abuse; non-consented care; lack of information, privacy and confidentiality; neglect and discrimination; and refusal of preference). Table 1 describes three to five questions that measure women's experience in each of the six categories of mistreatment. Women who

reported having experienced at least one type of mistreatment in a given category were regarded as mistreated in that category. Lack of information, privacy and confidentiality; non-consented care; and refusal of preference were the top three ranking categories of mistreatment reported by the women in both the pre-intervention and post-intervention groups. The level of non-consented care measured after the intervention (65.3%) is lower than before the intervention (83.3%), *p*<.001. Similarly, experiences of physical abuse (8.9% in the post-intervention and 16.7% in the pre-intervention group; p=.02) and refusal of preference (54.7% in the post-intervention and 67.7% in the pre-intervention group; p=.01) showed improvement when the pre-intervention group was compared with the post-intervention group. No difference was detected in the level of information provided, privacy and confidentiality between the two groups. The reported level of verbal abuse and neglect and discrimination also remained largely unchanged.

Multilevel analysis of changes in reported components of mistreatment

Outputs of the intercept-only model (model I) showed that there was significant variation between hospitals in the number of components of mistreatment experienced by women (Table 5). The intraclass correlation coefficient (ICC) of model I also revealed that 12.3% of the variation in the number of components of mistreatment experienced by women is attributable to differences across hospitals. Model II, a model with the main independent variable (intervention group), was different and fit as compared to model I (*p* for likelihood ratio (LR) test < 0.001). Furthermore, model III (a model that includes all the independent variables and the intervention group) was different and fit as compared to model II (*p* for LR test < 0.001). The ICC of model III shows a lower variation (9%) between the hospitals than models I and II. Model III displays the changes in the number of components of mistreatment experienced by participants of the two groups (pre-intervention and post-intervention) after adjusting for potential confounders.

As displayed in table 5, the number of components of mistreatment experienced by women in the post-intervention group is lower by 18% than those in the pre-intervention group; adjusted regression coefficient (Aβ) = 0.82, 95%CI: 0.74-0.91. The number of components of

mistreatment experienced by women was higher among women with complications during pregnancy (Aβ = 1.17, 95%CI: 1.01-1.34) or delivery (Aβ = 1.16, 95%CI: 1.03-1.32). Women who delivered by caesarean section after trial of vaginal delivery (Aβ = 0.76, 95%CI: 0.63-0.92) and by caesarean section without trial of vaginal delivery (Aβ = 0.68, 95%CI: 0.47-0.98) experienced fewer number of mistreatment components. The number of mistreatment components experienced by women did not significantly vary by women's demographic, service-related, or other obstetric characteristics not already mentioned above (Table 5).

Discussion

This study was conducted as part of a mixed methods implementation research that aims to identify health system barriers to respectful maternity care and to propose and test mitigation approaches. To our knowledge, this study is the first to report on the effectiveness of a respectful maternity care intervention (facility-level) in Ethiopia. The study found that the number of mistreatment components experienced by women after the respectful maternity care intervention was reduced by 18% compared to the number experienced by women before the intervention. This is a notable improvement given the small-scale intervention we implemented and the known limitations of interventions focused primarily on training health workers.[49] Training of service providers alone cannot be a solution to address mistreatment unless other system elements that significantly influence the behaviour of service providers are also addressed.

Similar implementation studies have been conducted in response to the growing attention to mistreatment and the need to identify recommendations to eliminate mistreatment. The *Heshima* study (Kenya)[39] and the *Staha* study (Tanzania)[41] were conducted to assess the impact of respectful maternity care interventions on the level of mistreatment. The *Heshima* study involved a multi-component respectful maternity care intervention (policy, facility, and community level); 7% reduction in the prevalence of mistreatment was reported following the intervention.[39] The *Staha study* involved community level (client service charter) and facility-

level (quality improvement inventory and intervention in maternity wards) interventions, and reported a 66% reduction in the odds of women reporting mistreatment after the intervention.[41] Both *Heshima* and *Staha* studies used a prevalence measure of mistreatment; women who faced at least one form of mistreatment were labelled as mistreated. Considering women who encountered at least one form of mistreatment as mistreated in these studies may have resulted in the underestimation of the magnitude of change.

In this study, the proportion of women who experienced non-consented care, physical abuse, and refusal of preference was significantly lower in the post-intervention group. No significant difference was observed in the proportion of women who experienced mistreatment in the remaining three categories of mistreatment (verbal abuse; lack of information, privacy and confidentiality; and neglect and discrimination). The very high proportion of women who reported 'non-consented care' suggests that the issue of obtaining consent is not well understood by the staff (and probably by the hospital administration also). Similarly, the very high proportion of women who reported 'lack of information, privacy and confidentiality' and 'refusal of preferences' suggests a poor understanding of these concepts and rights. These are areas that need to be integrated and foregrounded into professional development/quality improvement programs for all levels of staff and need to be integrated into the pre-service training of health professionals.

According to the *Health Workers for Change* study conducted in four African countries, structural issues such as shortage/lack of manpower and supplies, and poor working conditions inhibit implementation of change interventions.[50] According to the Bowser and Hill framework[51], structural constraints not only impede change initiatives, they also independently contribute to mistreatment. Thus, the categories of mistreatment that were likely to have been a product of these structural issues were not influenced by the intervention because it lacked a structural dimension.

All hospitals included in this study do not have a private ward which means that several women are labouring in the same room. This fact combined with the increased presence of birth companions after the intervention may explain the relative lack of improvement in women's privacy. Adequate preparation and adaptation of labour wards is recommended before operationalizing birth companionship in resource-limited contexts.[34, 52] Lunze and colleagues reviewed 259 (83 sub-Saharan Africa based) studies and reports of innovative approaches for improving maternal and newborn health, using the lens of WHO's health system building blocks. The review revealed that interventions in one health system building block affected other building blocks; the review recommends a system-wide intervention to maximize the effectiveness and sustainability of interventions.[53] Similarly, WHO also recommends that respectful maternity care should be viewed through the lens of systems thinking when prioritizing action areas to improve quality of care.[36]

What makes the *Staha* study similar to our study is that, no changes in the level of verbal abuse and neglect and discrimination were observed after the intervention.[41] This might be explained by the fact that ingrained negative and normalized behaviours require time to change and are highly associated with age and experience of service providers, younger and less experienced providers being less supportive during labour.[54] Additionally, other factors such as uncomfortable working circumstances, overcrowded facilities, space constraints, and poorly motivated staff are not only barriers to the implementation of new guidelines[55] but also contributors to mistreatment.[51] These factors may have contributed to the steady level of the mistreatment components that did not improve in the current study.

Evidence suggests that women's chosen birth companionship contributes to positive birth outcomes for both the mother and the newborn[56] and is recommended by the WHO.[34] In this study, among 120 women who wanted to have a birth companion, only 18(15%) were allowed to have their chosen companion (11.6% in pre-intervention vs 23.5% in post-intervention group). Additionally, 16.7% (14% in pre-intervention vs 23.5% in post-intervention group) of those who would have wanted to have a companion were afraid to ask service providers about this. These

unexpressed preferences highlight that facilities and service providers should promote companionship rather than wait for the request to come from women.[34, 56] And this should be supported by political commitment, high-level advocacy, and operating guidelines.[57] The proportion of women who reported to have their preference during childbirth in the post-intervention survey was lower than that of pre-intervention survey participants; this may be due to the high proportion of women who had a caesarean birth in the post-intervention survey.

Various macro and micro level external factors can act as enablers and disablers to change initiatives. According to WHO, emergent political unrest or conflicts result in the crackdown of health systems and deter the progress of health interventions.[1] A review by Sousa demonstrated that political violence deteriorates the functioning of government-operated public health services.[58] Accordingly, the political violence that erupted in the study area one month after training of service providers and six weeks before the post-intervention survey may have compromised the changes that would have been otherwise achieved.

In this study, comparing the number (counts) of mistreatment components women experienced helped to identify the changes in the extent or diversity of mistreatment that would not have been possible to identify by simple prevalence measures. Additionally, treating hospitals as random-effects in the statistical model controls for the impact of other interventions that may have happened around the same time as the study intervention. The absence of difference in demographic and obstetric characteristics between women of the two groups (pre-intervention and post-intervention) also adds to the soundness of the statistical analysis used to detect changes in mistreatment. Additionally, where women are admitted in a shared ward, comparing the proportion of women mistreated rather than comparing the counts of mistreatment fails to detect changes that might have resulted after an intervention. This is because, there are components of mistreatment that cannot be totally prevented without major structural changes, for example, provision of adequate space to ensure privacy and confidentiality.[40]

One of the limitations of this study is that the mistreatment components experienced by women repeatedly were counted only once. This approach ignores multiple incidents of mistreatment components experienced by women; hence, it fails to capture how frequently women were mistreated. A survey of women at their exit, as in this study, is prone to recall bias in acquiring data on multiple incidents; instead, independent observation in the labour room would be more appropriate.[59] However, observation also has inherent limitations, e.g. the Hawthorne effect—service providers modify their behaviour and become less disrespectful because they know they are being observed. Pertaining to the generalizability of findings, because the study was conducted only in three hospitals located in the SNNPR, the findings may not be generalizable to other types of hospitals, health centres, and clinics that provide childbirth services in Ethiopia. Additionally, the short washout period and the lack of a control group in this study is a key limitation as it is not possible to attribute with certainty the changes observed to the respectful maternity care intervention.

Finally, we believe that this study being the first to test the effectiveness of a respectful maternity care intervention in Ethiopia, contributes to evidence for further endeavours to improve respectful maternity care specifically, and the quality of childbirth services generally. Thorough implementation studies that are designed to capture macro and micro level contributors to mistreatment need to be conducted to inform evidence-driven actions to eliminate mistreatment during facility-based childbirth in Ethiopia.

Conclusions

This study revealed that the childbirth services women received in the study hospitals were characterized by a wide range of mistreatment behaviours and/or health facility conditions. The respectful maternity care intervention tested in this study was accompanied by a reduction in women's experience of mistreatment during facility-based childbirth. Given the variety of factors that lead to mistreatment in health facilities, interventions designed to mitigate mistreatment need to be multidimensional—including demand-side (community level), supply-side (health system level), and policy-level interventions. We believe that this study adds to existing

knowledge on innovations that can be used to mitigate mistreatment. Further research is needed to investigate the impact and sustainability of health system-level interventions on women's experiences of mistreatment during facility-based childbirth.

Acknowledgements

We would like to pass our heartfelt thanks to experts at the Federal Ministry of Health, the SNNPR Health Bureau, and Hawassa University College of Medicine and Health Sciences who reviewed the respectful maternity care training manual and coordinated the training sessions. We also extend our appreciation to all participants of the study, service providers, and facility administrations for being an active player in the smooth operation of the study. Members of the data collection team also deserve a warm appreciation for their engagement.

Contributors

AA conceived the study; AA, AM and MK designed the study, developed data collection tools; AA trained data collectors, coordinated the fieldwork; AA, SA, HM, ET and SG conducted the intervention; AA, AM and MK analysed the data; AA, AM and MK drafted the manuscript; SA, HM, ET and SG revised the manuscript for intellectual content. All authors have read and approved the manuscript.

Funding

The training of service providers was made possible by support from the Institute of Healthcare Improvement (IHI) through the Federal Ministry of Health, Ethiopia. The primary author of this study is the recipient of the Melbourne Research Scholarship (University of Melbourne), and the Population Health Investing in Research Students' Training (PHIRST) travel grant (Melbourne School of Population and Global Health, University of Melbourne). The contents of this research article only reflect the authors' opinions but do not show interest/s of either of the organizations involved in the funding.

Competing interests

The authors declare that they have no competing interests

Ethics approval

Ethics approval was obtained from the Institutional Review Board (Ethics ID: 3-12/12926) located in SNNPR Health Bureau, Ethiopia and the Human Ethics Sub-Committee (Ethics ID: HESC 1750054) at the University of Melbourne, Australia. Permission letter to conduct this study was also granted from the Federal Ministry of Health and SNNPR Health Bureau. Information about the study was delivered to all study participants in local languages and written consent was obtained.

Data sharing statement

Reasonable requests can be made to access study data from the corresponding author.

Word count: 5786

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Table 1 Women's experience of mistreatment during childbirth

Types of mistreatment experienced	Pre-intervention n (%)	Post-intervention n (%)	*p*-value for χ^2
Verbal abuse	17 (8.6)	11 (5.8)	0.29
Health workers used harsh or rude language	8 (4.0)	6 (3.2)	0.64
Health workers made judgmental or accusatory comments about woman	8 (4.1)	2 (1.1)	0.06
Health workers made threats of withholding treatment	1 (0.5)	2 (1.1)	0.54
Health workers blamed woman for any features of birth outcome	4 (2.0)	4 (2.1)	0.95
Physical abuse	33 (16.7)	17 (8.9)	0.02*
Woman was beaten, slapped, kicked, or pinched	7 (3.5)	5 (2.6)	0.61
Woman was gagged	19 (9.6)	11 (5.8)	0.16
Woman was restrained	19 (9.6)	9 (4.74)	0.06
Non-consented care	165 (83.3)	124 (65.3)	<0.001*
Health workers did not obtain consent for procedure/s	138 (69.7)	84 (44.2)	<0.001*
Health workers ever separated woman from her baby without explaining	14 (7.1)	7 (3.7)	0.14
Health workers did not ask woman's permission before conducting vaginal examination	128 (64.7)	91 (47.9)	0.001*
Health workers did not ask woman's permission before performing surgery (episiotomy or caesarean section) (n=220)	69 (65.1)	44 (38.6)	<0.001*
Health workers made woman stay in the hospital against her will	4 (2.0)	2 (1.1)	0.44
Lack of information, privacy and confidentiality	189 (95.5)	182 (95.8)	0.88
Health workers did not keep woman's information confidential	18 (9.1)	7 (3.7)	0.03*
Health workers conducted vaginal examination without maintaining woman's privacy	162 (81.8)	147 (77.4)	0.28
Health workers did not give periodic updates on woman's labour	104 (52.5)	129 (67.9)	0.002*
Health workers spoke to woman in a language she could not understand	5 (2.5)	9 (4.7)	0.24
Neglect and discrimination	24 (12.1)	17 (8.9)	0.31
Health workers did not always come following woman's call	8 (4.0)	7 (3.7)	0.86
Woman was ever left for a prolonged period of time without attention	19 (9.6)	12 (6.3)	0.23
Health worker was not present for the actual birth of woman's baby	5 (2.5)	3 (1.6)	0.51
Health workers discriminated woman based on her attribute	-	2 (1.1)	-
Refusal of preference	134 (67.7)	104 (54.7)	0.01*
Health workers did not allow woman to have a birth companion present	64 (86.5)	18 (69.2)	0.04*
Health workers did not allow woman to move around during labour	43 (76.7)	63 (94.3)	0.002*
Health workers did not allow woman to have foods or fluids	66 (94.3)	62 (98.4)	0.21
Health workers did not allow woman to deliver in her preferred position	43 (66.2)	12 (33.3)	0.001*
Health workers did not allow woman to have cultural practice in labour	16 (76.2)	0 (-)	-

Table 2 Women's sociodemographic characteristics

Variables		Pre-intervention n (%)	Post-intervention n (%)	*p*-value for χ^2
Place of residence	Urban	125 (63.1)	119 (62.6)	0.92
	Rural	73 (36.9)	71 (37.4)	
Age in completed year	15-24	98 (49.5)	96 (50.5)	0.93
	25-34	89 (45.0)	85 (44.8)	
	35-44	11 (5.5)	9 (4.7)	
	Median (IQR)	25 (7)	24 (8)	
Age at first pregnancy	Median (IQR)	20 (4)	20 (4)	0.72
Educational level	No formal education	29 (14.7)	38 (20.0)	0.13
	Primary education	81 (40.9)	74 (39.0)	
	Secondary education	48 (24.2)	54 (28.4)	
	College and above	40 (20.2)	24 (12.6)	
Marital status	Single	2 (1.0)	1 (0.5)	0.86
	Married	195 (98.5)	188 (99.0)	
	Separated	1 (0.5)	1 (0.5)	
Religion	Christian Protestant	140 (70.7)	141 (74.2)	
	Christian Orthodox	27 (13.6)	27 (14.2)	0.29
	Christian Catholic	7 (3.5)	2 (1.0)	
	Muslim	17 (8.6)	10 (5.3)	
	Others	7 (3.6)	10 (5.3)	
Ethnicity	Sidama	139 (70.2)	128 (67.4)	0.20
	Oromo	7 (3.5)	15 (7.9)	
	Amhara	13 (6.6)	17 (9.0)	
	Wolayita	17 (8.6)	17 (9.0)	
	Others	22 (11.)	13 (6.8)	
Occupation	Housewife	101 (51.0)	134 (70.5)	< 0.001
	Private employee	8 (4.0)	8 (4.21)	
	Government employee	36 (18.2)	29 (15.3)	
	Private business	41 (20.7)	13 (6.8)	
	Others	12 (6.1)	6 (3.2)	
Respondent has regular	Yes	89 (45.0)	69 (36.3)	0.08
monthly income*	< 1552 Br	34 (38.2)	25 (36.2)	0.8
	≥ 1552 Br	55 (61.8)	44 (63.8)	
	Median (IQR)	2000 (2015)	2000 (1900)	
	No	109 (55.0)	121 (63.7)	

**1USD = 27.23 Br (Average between March and August 2018)*

Table 3 Women's obstetric and maternal healthcare characteristics

Variables		Pre-intervention n (%)	Post-intervention n (%)	*p*-value for χ^2
Total number of deliveries	One	88 (44.4)	92 (48.4)	0.43
	Two or more	110 (55.6)	98 (51.6)	
	Median (IQR)	2 (1)	2 (2)	
Place of delivery of previous child (n=206)	Health facility	82 (75.2)	68 (70.1)	0.41
	Outside health facility	27 (24.8)	29 (29.9)	
Number of previous facility-based deliveries	None	22 (20.2)	22 (22.5)	
	One	69 (63.3)	53 (54.0)	
	Two and more	18 (16.5)	23 (23.5)	
	Median (IQR)	1 (0)	1 (0)	
Antenatal visit during index pregnancy	Yes	188 (94.9)	184 (96.8)	0.35
	One	5 (2.7)	9 (4.9)	0.04
	Two	28 (14.9)	44 (23.9)	
	Three or more	155 (82.4)	131 (71.2)	
	No	10 (5.1)	6 (3.2)	
Experienced complication during index pregnancy	Yes	34 (17.2)	19 (10.0)	0.04
	No	164 (82.8)	171 (90.0)	
Experienced complication during index delivery	Yes	67 (34.0)	70 (36.8)	0.56
	No	130 (66.0)	120 (63.2)	
Referral status on admission	Referred	81 (40.9)	86 (45.3)	0.39
	Non-referred	117 (59.1)	104 (54.4)	
Time of admission*	Day time	106 (53.5)	99 (52.1)	0.78
	Night-time	92 (46.5)	91 (47.9)	
Time of delivery*	Day time	94 (47.5)	109 (57.4)	0.05
	Night-time	104 (52.5)	81 (42.6)	
Type of delivery	Vaginal delivery	174 (87.9)	147 (77.4)	0.01
	Caesarean after trial of vaginal delivery	18 (9.1)	38 (20.0)	
	Caesarean without trial of vaginal delivery	6 (3.0)	5 (2.6)	
Had intervention/s for vaginal delivery (n=377)**	Yes	89 (46.4)	73 (39.5)	0.15
	No	101 (53.6)	111 (60.5)	
Types of assisted vaginal delivery (n=162)[§]	Vacuum extraction	12 (13.5)	9 (12.3)	0.83
	Forceps delivery	8 (9.0)	2 (2.7)	0.10
	Episiotomy	82 (92.1)	71 (97.3)	0.16
Gender of main service provider	Female	121 (61.1)	98 (51.6)	0.06
	Male	77 (38.9)	92 (48.4)	

**Stayed in hospital for at least two hours between 8pm and 8am immediately before childbirth*

***Includes: Episiotomy, vacuum extractor or forceps*

[§]a woman can have more than one procedure

Table 4 Women's preferences during childbirth

Variables		Pre-intervention n (%)	Post-intervention n (%)	*p*-value for χ^2
Woman wanted to have birth companion in the labour ward	Yes	86 (43.7)	34 (17.9)	<0.001
	No	111 (56.5)	156 (82.1)	
Woman wanted to move around during birth	Yes	57 (28.8)	67 (35.5)	0.16
	No	141 (71.1)	122 (64.5)	
Woman wanted to have food or fluids during birth	Yes	70 (35.4)	63 (33.2)	0.65
	No	128 (64.6)	127 (66.8)	
Woman had a preferred birthing position	Yes	69 (34.9)	36 (19.1)	<0.001
	No	129 (65.1)	153 (80.9)	
Woman wanted to have cultural practice in labour	Yes	43 (21.7)	17 (8.9)	0.001
	No	155 (78.3)	173 (91.1)	

**a participant can have more than one procedure*

Table 5 Multilevel mixed-effects regression of counts of mistreatment experienced by women

Variables	Model I β (95% CI)	Model II β (95% CI)	Model III β (95% CI)
A) Fixed effects			
(Intercept)	4.32 (3.60, 5.12)	**4.82 (3.98, 5.84)***	7.18 (3.34, 15.44)
Intervention group			
Pre-intervention		Ref.	Ref.
Post-intervention		**0.79 (0.72, 0.87)***	**0.82 (0.74, 0.91)***
Place of residence			
Urban			Ref.
Rural			1.05 (0.93, 1.19)
Age in completed year			
15-24			Ref.
25-34			0.95 (0.82, 1.09)
35-44			0.81 (0.61, 1.08)
Age at first pregnancy			1.01 (0.99, 1.03)
Marital status			
Single			Ref.
Married			0.79 (0.45, 1.39)
Separated			1.06 (0.49, 2.31)
Religion			
Christian Protestant			Ref.
Christian Orthodox			0.93 (0.76, 1.12)
Christian Catholic			1.01 (0.73, 1.40)
Muslim			1.07 (0.88, 1.31)
Others			0.80 (0.60, 1.07)
Ethnicity			
Sidama			Ref.
Oromo			0.93 (0.72, 1.19)
Amhara			0.98 (0.77, 1.25)
Wolayita			1.13 (0.92, 1.40)
Others			1.00 (0.81, 1.24)
Educational level			
No formal education			Ref.
Primary education			0.99 (0.84, 1.15)
Secondary education			0.98 (0.81, 1.18)
College and above			1.07 (0.84, 1.38)
Occupation			
Housewife			Ref.
Private employee			1.06 (0.77, 1.47)
Government employee			0.95 (0.72, 1.25)
Private business			1.01 (0.80, 1.27)
Others			0.90 (0.69, 1.16)
Has regular monthly income*			
No			Ref.
Yes			0.92 (0.75, 1.13)
Total number of deliveries			
One			Ref.
Two or more			0.86 (0.74, 1.02)
Antenatal visit during index pregnancy			
No			Ref.
Yes			0.95 (0.74, 1.22)
Experienced complication during index pregnancy			
No			Ref.
Yes			**1.17 (1.01, 1.34)**
Experienced complication during index delivery			
No			Ref.

Yes			**1.16 (1.03, 1.32)***
Referral status on admission			
Referred			Ref.
Non-referred			1.07 (0.94, 1.21)
Total hours of stay			1.00 (0.99, 1.00)
Gender of main service provider			
Female			Ref.
Male			1.03 (0.93 1.16)
Type of delivery			
Vaginal delivery			Ref.
Caesarean after trial of vaginal delivery			**0.76 (0.63, 0.92)***
Caesarean without trial of vaginal delivery			**0.68 (0.47, 0.98)***
Had intervention for vaginal delivery			
No			Ref.
Yes			1.04 (0.91, 1.19)
B) Random effects			
Hospital			
Variance	0.02 (0.01-0.14)*	0.03 (0.01-0.14)*	0.01 (0.001-0.08)*
ICC (%)	12.3	13.6	9.0
C) Model fitness			
AIC	1600	1577	1570
Log Likelihood	-798	-786	-750
P value	-	< 0.001	< 0.001

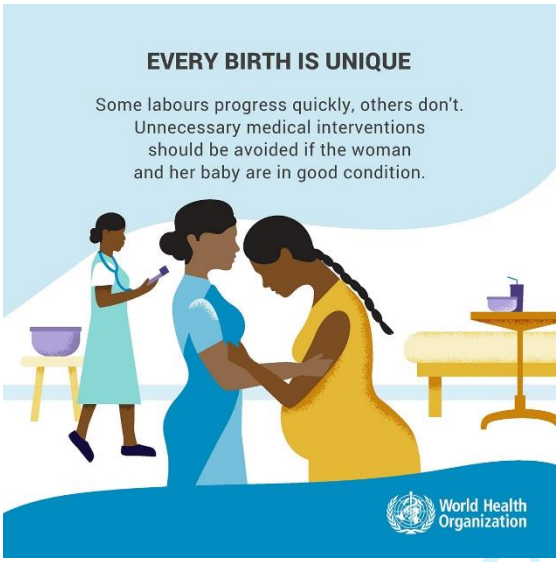
- *Significant at p<.05*

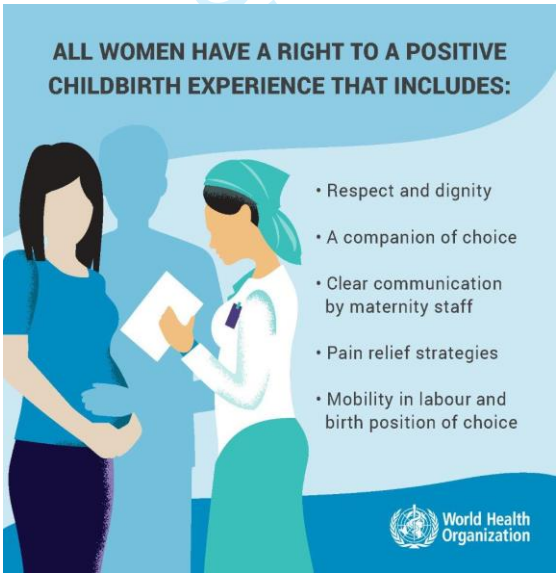
*Abbreviations: **β** exponentiated regression coefficient, **CI** confidence interval, **ICC** Intraclass correlation, **AIC** Akaike's information criterion*

Supplementary file 1: Wall posters

Respectful maternity care: The universal rights of childbearing women

Infographics for a positive childbirth experience





The universal rights of childbearing women endorsed by the Federal Ministry of Health, Ethiopia (Amharic version)

ርህራሄ እና አክብሮት የተሞላበት የጤና አገልግሎት ማግኘት

የሁሉም እናቶች መብት ነው!!

የኢትዮጵያ ፌዴራላዊ ዴሞክራሲያዊ ሪፐብሊክ
የጤና ጥበቃ ሚኒስቴር
Federal Democratic Republic of Ethiopia
Ministry of Health

ርህራሄ እና አክብሮት ለእናቶች

I. ርህራሄ እና አክብሮት የተሞላበት የጤና አገልግሎት ምን ማለት ነው?

ይህ ፅንሰ-ሀሳብ ተገልጋይን ያማከለ የጤና አገልግሎት፣ የስነ-ምግባር መርሆችን (የእናቶች ነፃነት፣ ክብር፣ ስሜት፣ ምርጫዎች)፣ ሰብዓዊ መብትን፣ እንዲሁም የእናትየዋንና የጨቅላ ህፃኑን ፍላጎት ግምት ውስጥ ባስገባ መልኩ ለእናቶች እና ጨቅላ ህፃናት ጤና አገልግሎት መስጠትን ያጠቃልላል።

በወላድ እናቶች ላይ የሚደርስ ርህራሄ እና አክብሮት የጎደለው አገልግሎት የሚገለፅባቸው መንገዶች

- **አካላዊ ጥቃት፡** መምታት፡ መገፍተር ወይም እናቶችን ርህራሄ በጎደለው መልክ አካላዊ ምርመራ ማድረግ
- **አክብሮት የጎደለው ክብካቤ፡** የእናቶችን ክብር የሚያዋርድ ቃል፣ ተግባር እና ሌሎች ከቃል ውጭ ያሉ የመግባቢያ መንገዶችን መጠቀም፣ የእናቶችን በነፃ ሀሳብ የመግለፅ መብት መንፈግ እና በምርመራ ጊዜ ለእናቶችን ምቹ ሁኔታዎችን አለማድረግ
- **በፈቃደኝነት ላይ ያልተመሰረተ ክብካቤ፡** በሚደረጉ ምርመራዎችና ህክምናዎች ዙርያ እናቶች ሊረዱት በሚችሉት ቋንቋ እና ደረጃ በቂ ገለፃ አለመስጠት እና በራሳቸው ውሳኔ ላይ እንዲደርሱ አለመርዳት
- **ምስጢራዊነቱ ያልተጠበቀ ክብካቤ፡** ምስጢራዊነቱ ያልተጠበቀ የምክር አገልግሎት፣ የአካል ምርመራና ህክምና ማድረግ፣የእናቶችን የህክምና እና የግል መረጃ በሚስጥር አለመጠበቅ፣ እናትና ጨቅላ ህፃን አንድ ላይ እንዲሆኑ አለመፍቀድ/አለማድረግ
- **አድሎ ማድረግ፡** በእናቶች ብሄር፣ ባህል፣ ኢኮኖሚ እና ትምህርት ደረጃ ምክንያት የሚሰጣቸው ክብካቤ ላይ አድሎ ማድረግ
- **እናቶች ማግኘት የሚገባቸውን ክብካቤ መከልከል/ሙሉ በሙሉ አለመስጠት፡** እናቶችን በወሊድ/በምጥ ጊዜ እና ከወለዱ በኋላ ባሉት ሰዓታት ብቻቸውን ሙተው እና እርዳታ ቢያስፈልጋቸው እንኳ እንዴት ሊያገኙ እንደሚችሉ መረጃ አለመስጠት። በወሊድ/በምጥ ጊዜ እና ከወለዱ በኋላ ባሉት ጊዜያት የሚመርጡት አጋር ለምሳሌ የቤተሰብ አባል፣ የልምድ አዋላጅ የመሳሰሉት አብረዋቸው እንዲሆኑ አለመፍቀድ።
- **እናቶችን እና የወለዱትን ጨቅላ ህፃን በጤና ተቋማት ማገት፡** በተለያየ ምክንያት ለምሳሌ ከአገልግሎት ክፍያ ጋር በተያያዘ ሳይከፍሉ እንዳይወጡ መያዝ የካትታል።

II. ለሁሉም በመውለድ እድሜ ክልል ላሉ ሴቶች የተሰጠ የቅድመ ወሊድ የወሊድና የድህረ ወሊድ ጤና ክብካቤና አገልግሎት የማግኘት አለም አቀፍ ሰብአዊ መብት :- ርህራሄ እና አክብሮት የተሞላበት የጤና አገልግሎት

አንቀፅ I: ማንኛዋም ሴት ኢ-ሰብአዊ ከሆነ ወይም ክብሯን ከሚያዋርድ አያያዝ ወይም ጥቃት የመጠበቅ መብት አላት:: ማንም ሰው አካላዊ ጥቃት ሊያደርስብሽ አይችልም::

አንቀፅII: ማንኛዋም ሴት መረጃ የማግኘት፣ በወሊድ ጊዜ አብሯት የሚሆን ሰው መምረጥን ጨምሮ በሚሰጣት ክብካቤና ህክምና ላይ በእውቀት ላይ የተመሰረተ የመሰማማት ወይም ያለመስማማት መብት ያላት ሲሆን ምርጫዋም ሊከበርላት ይገባል:: ማንም ሰው ያለ ፍቃድሽ በሃይል ሊያስገድድሽ አይችልም::

አንቀፅ III: ማንኛዋም ሴት የግል ህይወቷ ግላዊነቷ እንዲሁም ሚስጥሯ የመጠበቅ መብት አላት:: ማንም ሰው ሊያጋልጥሽ ወይም ሚስጥርሽን ሊያወጣ አይችልም::

አንቀፅ IV: ማንኛዋም ሴት ሰብአዊ ክብሯና መልካም ስሟ የመጠበቅ መብት አላት:: ማንም ሰው ሊያዋርድሽ ወይም የቃላት ጥቃት ሊያደርስብሽ አይችልም::

አንቀፅ V: ማንኛዋም ሴት የዘር፣ የሃይማኖት፣ የብሄር፣ የሀብት፣ በፖለቲካ፣ በማህበራዊ አመጣጥ፣ በትውልድ ወይም በሌላ አቋም ልዩነት እና መድልዎ ሳይደረግባት በእኩል የመታከም መብት አላት:: ማንም ሰው ስላንቺ ያልወደደው ነገር ቢኖር ሊያገልሽ ወይም መድልዎ ሊያደርግብሽ አይችልም ::

አንቀፅ VI: ማንኛዋም ሴት ጤንነቷ ተጠብቆ የመኖርና የጤና ክብካቤ የማግኘት መብት አላት:: ማንም ሰው የቅድመ ወሊድ የወሊድና የድህረ ወሊድ ጤና ክብካቤና አገልግሎት ከማግኘት ሊያግድሽ አይችልም::

አንቀፅ VII: ማንኛዋም ሴት የነጻነት፣ ራስን በራስ የማስተዳደር፣ የራስን ዕድል በራስ የመወሰን ብሎም ያለመገደድ መብት አላት:: ማንም ሰው በህግ ስልጣን ሳይኖረው ወይም በህግ ከተደነገገው አንቺን ወይም ልጅሽን ሊይዝ ወይም ሊያቆይ አይችልም::

“ርህራሄ እና አክብሮት የተሞላበት የጤና አገልግሎት ለጤናማ እናትነት”

የኢትዮጵያ ፌዴራላዊ ዴሞክራሲያዊ ሪፐብሊክ
የጤና ጥበቃ ሚኒስቴር
Federal Democratic Republic of Ethiopia
Ministry of Health

ርህራሄ እና አክብሮት ለእናቶች

Supplementary file 2

Facility-led respectful maternity care assessment checklist for continuous quality improvement

RMC standards	Measurement criteria O: observation; I: interview; RD: review of documents		NA	Remark
The woman is protected from verbal abuse	[ ]	1. Uses polite language, avoids use of harsh or rude language **(O)**		
	[ ]	2. Does not make judgmental or accusatory comments **(O)**		
	[ ]	3. Does not make threats to withhold treatment **(O)**		
	[ ]	4. Does not blame a woman for any feature of her birth outcome/s **(O)**		
Score	___**of** ___			
The woman is protected from physical abuse	[ ]	1. Does not beat, slap, kick, or pinch a woman **(O)**		
	[ ]	2. Does not deny a woman to cry or scream during labor **(O)**		
	[ ]	3. Does not restrain (tie) a woman **(O)**		
Score	___**of** ___			
The woman is not stigmatized or discriminated	[ ]	1. Serves a woman respectfully regardless of her religion/race/ethnicity/age/socioeconomic status/medical condition **(O/I)**		
	[ ]	2. Serves a woman respectfully regardless of her medical condition **(O/I)**		
Score	___**of** ___			
The woman received professional standard of care	[ ]	1. Seeks for woman's consent prior to performing any procedure **(O)**		
	[ ]	2. Never shouts loudly when communicating woman's information to other staff **(O/I)**		
	[ ]	3. Keeps woman's personal information secure (**O/I/RD)**		
	[ ]	4. Performs vaginal examination very gently to minimize pain **(O/I)**		
	[ ]	5. Maintains woman's privacy while performing vaginal examination **(O/I)**		
	[ ]	6. Gives a woman pain relief when she needs it **(O/I)**		
	[ ]	7. Obtains woman's consent before preparing her for surgery **(O/I)**		
	[ ]	8. Responds to a woman immediately following her call **(O/I)**		
	[ ]	9. Never leaves a woman alone during labour **(O/I)**		
Score	___**of** ___			
	[ ]	1. Introduces himself/herself to a woman when he/she first meet her **(I/O)**		

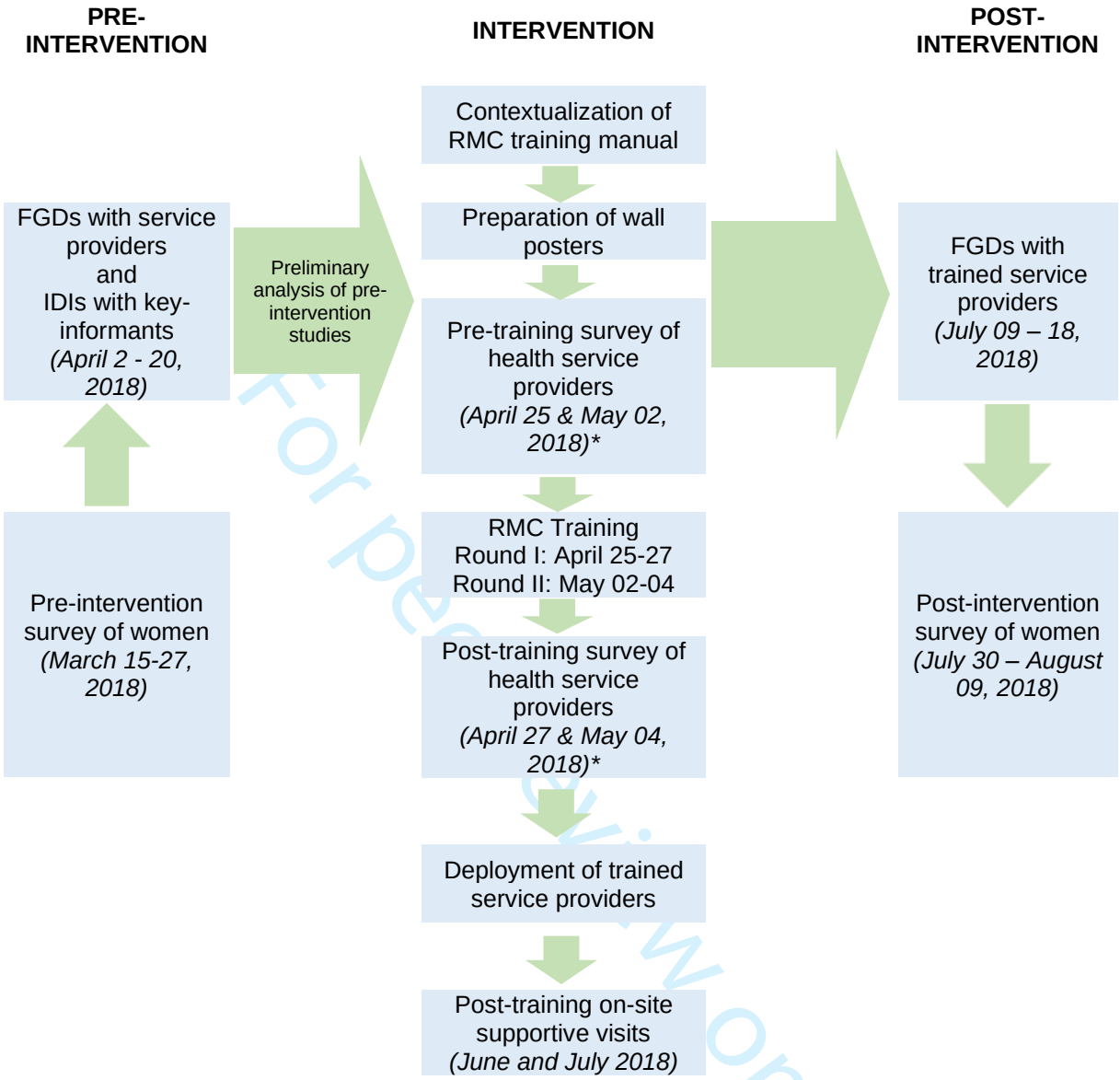
The woman received care with good provider rapport and communication	[ ]	2. Serves a woman in a polite manner **(I/O)**		
	[ ]	3. Does not ignore woman's concern/s while she is in labor **(I/O)**		
	[ ]	4. Speaks to a woman in a clear language **(I/O)**		
	[ ]	5. Gives a woman periodic updates of progress of labor **(O/I)**		
	[ ]	6. Gives credit to every effort a woman makes in labor **(O/I)**		
	[ ]	7. Allows a woman to move around during labor unless there is an indication to deny her **(O/I)**		
	[ ]	8. Allows a woman to take food or fluids if there is no other indication to deny her **(I/O)**		
	[ ]	9. Allows woman's birth companions for companionship **(I/O)**		
	[ ]	10. Allows a woman to assume position of her choice during labor **(I/O)**		
	[ ]	11. Allows a woman any cultural practice she wants to practice in labor **(I/O)**		
	[ ]	12. Does not objectify a woman in labor **(I/O)**		
	[ ]	13. Does not make a woman stay in the hospital without her will **(I/O)**		
	[ ]	14. Keeps a baby with his mom unless there is another indication **(O/I)**		
Score	___**of** ___			
Grand score	___**of** ___			

NA: Not applicable

Action plan matrix to improve respectful maternity care

Indicator (intended target)	Possible cause (key causes)	Action taken (test action)	Responsible person	Support required	Timeline (dd/mm/yy)	Evaluate/ lesson learned (study)	Action for the next cycle
I: T:	C1: C2:						□Modify □Expand □Drop

Supplementary file 3: Order of studies and timing of data collection



RMC-respectful maternity care
**RMC training was conducted in two rounds from 25-27 April 2018 and 02-04 May 2018.*
The post intervention FGDs and the post-intervention survey of women providers were conducted after the intervention has been completed

Reporting checklist for quality improvement study.

Based on the SQUIRE guidelines.

Instructions to authors

Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

Your article may not currently address all the items on the checklist. Please modify your text to include the missing information. If you are certain that an item does not apply, please write "n/a" and provide a short explanation.

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	Reporting Item	Page Number
Title		
#1	Indicate that the manuscript concerns an initiative to improve healthcare (broadly defined to include the quality, safety, effectiveness, patientcenteredness, timeliness, cost, efficiency, and equity of healthcare)	1

Abstract			
	#02a	Provide adequate information to aid in searching and indexing	2
	#02b	Summarize all key information from various sections of the text using the abstract format of the intended publication or a structured summary such as: background, local problem, methods, interventions, results, conclusions	2
Introduction			
Problem description	#3	Nature and significance of the local problem	4
Available knowledge	#4	Summary of what is currently known about the problem, including relevant previous studies	4,5,6
Rationale	#5	Informal or formal frameworks, models, concepts, and / or theories used to explain the problem, any reasons or assumptions that were used to develop the intervention(s), and reasons why the intervention(s) was expected to work	5,6
Specific aims	#6	Purpose of the project and of this report	6
Methods			
Context	#7	Contextual elements considered important at the outset of introducing the intervention(s)	7
Intervention(s)	#08a	Description of the intervention(s) in sufficient detail that others could reproduce it	7,8,9

Intervention(s)	#08b	Specifics of the team involved in the work	8,9
Study of the Intervention(s)	#09a	Approach chosen for assessing the impact of the intervention(s)	10,11,12
Study of the Intervention(s)	#09b	Approach used to establish whether the observed outcomes were due to the intervention(s)	12
Measures	#10a	Measures chosen for studying processes and outcomes of the intervention(s), including rationale for choosing them, their operational definitions, and their validity and reliability	10,11
Measures	#10b	Description of the approach to the ongoing assessment of contextual elements that contributed to the success, failure, efficiency, and cost	NA
Measures	#10c	Methods employed for assessing completeness and accuracy of data	11,12
Analysis	#11a	Qualitative and quantitative methods used to draw inferences from the data	12
Analysis	#11b	Methods for understanding variation within the data, including the effects of time as a variable	12
Ethical considerations	#12	Ethical aspects of implementing and studying the intervention(s) and how they were addressed, including, but not limited to, formal ethics review and potential conflict(s) of interest	23

Results

	#13a	Initial steps of the intervention(s) and their evolution over time (e.g., time-line diagram, flow chart, or table), including modifications made to the intervention during the project	27; Supp. file 6
	#13b	Details of the process measures and outcome	14,15,16,17
	#13c	Contextual elements that interacted with the intervention(s)	16,17
	#13d	Observed associations between outcomes, interventions, and relevant contextual elements	16,17
	#13e	Unintended consequences such as unexpected benefits, problems, failures, or costs associated with the intervention(s).	NA
	#13f	Details about missing data	NA
Discussion			
Summary	#14a	Key findings, including relevance to the rationale and specific aims	17
Summary	#14b	Particular strengths of the project	17,20
Interpretation	#15a	Nature of the association between the intervention(s) and the outcomes	17,18
Interpretation	#15b	Comparison of results with findings from other publications	17-20
Interpretation	#15c	Impact of the project on people and systems	18-20
Interpretation	#15d	Reasons for any differences between observed and anticipated outcomes, including the influence of context	18,19

Interpretation	#15e	Costs and strategic trade-offs, including opportunity costs	NA
Limitations	#16a	Limits to the generalizability of the work	21
Limitations	#16b	Factors that might have limited internal validity such as confounding, bias, or imprecision in the design, methods, measurement, or analysis	21
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Conclusion	#17b	Sustainability	21,22
Conclusion	#17c	Potential for spread to other contexts	21,22
Conclusion	#17d	Implications for practice and for further study in the field	21,22
Conclusion	#17e	Suggested next steps	22
Other information			
Funding	#18	Sources of funding that supported this work. Role, if any, of the funding organization in the design, implementation, interpretation, and reporting	22

BMJ Open

Mitigating the mistreatment of childbearing women: Evaluation of respectful maternity care intervention in Ethiopian hospitals

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2020-038871.R1
Article Type:	Original research
Date Submitted by the Author:	24-Jun-2020
Complete List of Authors:	Asefa, Anteneh; Hawassa University College of Medicine and Health Sciences, School of Public Health ; The University of Melbourne Nossal Institute for Global Health Morgan, Alison; The University of Melbourne Nossal Institute for Global Health Gebremedhin, Samson; Addis Ababa University College of Health Sciences, School of Public Health Lemango , Ephrem; Federal Ministry of Health , Maternal and Child Health Directorate Abebe, Sintayehu; Amref Health Africa in Ethiopia Magge, Hema; Institute for Healthcare Improvement Kermode, Michelle; The University of Melbourne Nossal Institute for Global Health
Primary Subject Heading:	Health services research
Secondary Subject Heading:	Public health
Keywords:	Clinical audit < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Quality in health care < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, PUBLIC HEALTH

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Mitigating the mistreatment of childbearing women: Evaluation of respectful maternity care intervention in Ethiopian hospitals

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Abstract

Objectives: There is a lack of evidence on approaches to mitigating mistreatment during facility-based childbirth. This study compares the experiences of mistreatment reported by childbearing women before and after implementation of a respectful maternity care intervention.

Design: A pre-post study design was undertaken to quantify changes in women's experiences of mistreatment during facility-based childbirth before and after the respectful maternity care intervention.

Intervention: A respectful maternity care intervention was implemented in three hospitals in southern Ethiopia between December 2017 and September 2018 and it included training of service providers, placement of wall posters in labour rooms, and post-training supportive visits for quality improvement.

Outcome measures: A 25-item questionnaire asking women about mistreatment experiences was administered to 388 women (198 in the pre-intervention, 190 in the post-intervention). The outcome variable was the number of mistreatment components experienced by women, expressed as a score out of 25. Multilevel mixed-effects Poisson modelling was used to assess the change in mistreatment score from pre-to post-intervention periods.

Results: The number of mistreatment components experienced by women was reduced by 18% when the post-intervention group was compared with the pre-intervention group (adjusted regression coefficient (Aβ)=0.82, 95%CI: 0.74-0.91). Women who had a complication during pregnancy (Aβ=1.17, 95%CI: 1.01-1.34) and delivery (Aβ=1.16, 95%CI: 1.03-1.32) experienced a greater number of mistreatment components. On the other hand, women who delivered by caesarean delivery after trial of vaginal delivery (Aβ=0.76, 95%CI: 0.63-0.92) and caesarean delivery without trial of vaginal delivery (Aβ=0.68, 95%CI: 0.47-0.98) experienced a lesser number of mistreatment components compared to those who had vaginal delivery.

Conclusions: Women reported significantly fewer mistreatment experiences during childbirth following implementation of the intervention. Given the variety of factors that lead to mistreatment in health facilities, interventions designed to mitigate mistreatment need to involve structural changes.

Keywords: mistreatment, respectful maternity care, intervention, pre-intervention, post-intervention

Strengths and limitations of this study

- This is the first study to test the effectiveness of a respectful maternity care intervention in Ethiopia.
- Comparing the counts of mistreatment components captures the diversity of mistreatment that would not have been possible by simple prevalence measures.
- Treating hospitals as random-effects controls for the impact of other interventions that may have happened around the same time in those facilities.
- Mistreatment components experienced by women were assessed using binary options (yes/no) questions which ignore multiple incidents of a mistreatment component.
- An exit survey of women is prone to recall bias in acquiring data on multiple incidents of mistreatment that would have been minimised by labour observation.

Introduction

Despite the remarkable decline in maternal mortality worldwide, around 800 women die each day due to preventable conditions that emerge in the course of pregnancy and childbirth.[1] According to the World Health Organization's (WHO) estimates, 295,000 maternal deaths occurred in 2017, of which 4.7% occurred in Ethiopia.[1] Low utilization of maternal health care services, especially care during childbirth, is a key challenge to reducing maternal mortality.[2, 3] In 2019, only 47.5% of women delivered in health facilities in Ethiopia.[4]

Women's negative experiences and/or other women's negative experiences of facility-based childbirth are commonly reported reasons for not attending a health facility at the time of delivery.[5-8] These experiences include hostile or insensitive staff[7], disallowance of birth companions[6, 7], disrespectful care[9-11], women's lack of autonomy[8], poor reception at health facilities[6], lack of privacy[6, 7], unfriendly staff[12], abusive care[12], and poor readiness of health facilities.[12] The attitudes, actions and system barriers that contribute to such negative experiences are nowadays labelled as mistreatment or disrespect and abuse. However, an internationally agreed definition of mistreatment or disrespect and abuse still lacks as behaviours that are acceptable to women in some contexts may be unacceptable to women in different contexts.

There is compelling evidence from many countries on the negative impact of mistreatment on the uptake of facility-based childbirth. An evidence synthesis of studies from 16 low and middle-income countries (LMICs) and China revealed that mistreatment during childbirth is a powerful deterrent to facility-based childbirth.[13] Additionally, studies from Afghanistan[14], Bolivia[15], Ghana[16], Kenya[17, 18], Tanzania[19], Malawi[20], and India[21] have clearly reported disrespectful care at birth as a key deterrent to facility-based childbirth.

The body of knowledge on mistreatment is still emerging and evolving, hence methodological approaches to estimate levels of mistreatment differ across settings, thereby making comparison challenging.[22, 23] Prevalence studies conducted in different parts of Ethiopia

between 2013 and 2017 report many examples of mistreatment ranging from non-consented care, non-confidential care, discriminatory care, abandonment of care, non-dignified care, to physical abuse during facility-based childbirth.[24-28]

The 2014 WHO statement, which condemns all forms of mistreatment during facility-based childbirth, identifies five actions to prevent and eliminate mistreatment globally. The statement calls for: evidence synthesis on the effectiveness of interventions that aim to improve respectful maternity care and thereby mitigate mistreatment, defining and measuring mistreatment, and inculcating service providers with the culture of respectful care at the time of birth.[29] Following this, various studies, including a multi-country study led by WHO, have been conducted to review and synthesize methodological frameworks for research on mistreatment.[13, 22, 23, 30-32] However, implementation research to assess the effectiveness of interventions to halt mistreatment have not been reported in Ethiopia.

In the move towards mitigating mistreatment, a focus on respectful maternity care is growing globally, and the 'Universal Rights of Childbearing Women' has been endorsed in several countries.[33] WHO defines respectful maternity care as "the 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".[34]

With the aim of meeting the maternal mortality targets of the Sustainable Development Goals (SDG), strategies for ending preventable maternal mortality were introduced in 2015. The strategy calls for health systems not to neglect respectful maternity care while endeavouring to deliver effective clinical interventions.[35] WHO's framework for quality maternal and newborn health care reinforces the important role of respectful maternity care, and identifies respect and preservation of dignity as one of the eight domains of quality of care.[36] Additionally, in 2018, WHO released guidelines for a positive childbirth experience which recommend respectful maternity care throughout labour and birth for all women.[34] A recent WHO paper published in

The Lancet that found high levels of mistreatment in four countries also highlighted the need for an urgent action to promote the provision of respectful maternity care worldwide.[37]

The government of Ethiopia launched a national movement entitled “the caring, respectful, and compassionate (CRC) health workforce” in 2016. The initiative is one of the four health sector transformation agendas aiming to achieve health targets set for the five years between 2015/16 – 2020/21.[38] However, respectful maternity care initiatives are in early-stage development and currently limited to a few pilot health facilities and technically supported by international partner organizations. Consequently, there is an evidence gap regarding implementation of effective respectful maternity care interventions in the country.

This study was undertaken to assess women’s experiences of mistreatment during facility-based childbirth before and after implementation of an intervention that was designed to improve the quality of care women receive during childbirth in hospitals. Previous respectful maternity care intervention studies from Kenya[39] and Tanzania[40, 41] revealed a significant reduction in the level of mistreatment and an improved attitude of service providers towards women, as a consequence of the interventions. This study is part of a broader interventional mixed methods study that aimed to identify health system challenges to the implementation of RMC and potential solutions to address these challenges. Lessons drawn from the respectful maternity care training and its implementation (Asefa et al. Lessons learned through respectful maternity care training and its implementation in Ethiopia: An interventional mixed methods study) and health system constraints to the promotion of respectful maternity care in Ethiopian hospitals (Asefa et al. Imagining maternity care as a complex adaptive system: understanding health system constraints to the promotion of respectful maternity care) are reported elsewhere. To our knowledge, this study is the first to report on the effectiveness of a respectful maternity care intervention in Ethiopia. The study findings add weight to the emerging evidence base on respectful maternity care, and will be used to inform planning and decision making concerning maternal health and other related services in Ethiopia.

Materials and methods

Study setting

This study was undertaken in three hospitals located in the Southern Nations Nationalities and Peoples Region (SNNPR), Ethiopia. Health services in Ethiopia are organized in three tiers: health posts, health centres, and primary hospitals are in the first tier; the second tier consists of general hospitals; and the third tier, specialized hospitals.[38] In principle, general hospitals are designed to serve a catchment population of 1-1.5 million people whereas primary hospitals are expected to serve 60,000 - 100,000 people. One of the study hospitals, Leku, is a primary hospital reported to be serving a catchment population of 261,271 including an estimated 8000 women who give birth each year. The other two hospitals, Adare and Yirgalem, are general hospitals serving a catchment population of 359,358 and 267,589, respectively. An estimated 10,000 and 9,000 pregnant women give birth each year in the catchments of Adare and Yirgalem hospitals, respectively. The hospitals were selected purposively taking into consideration their geographical proximity and their varying level in the tiers of the Ethiopian health system. The intervention involved only these three hospitals. None of hospitals have a private labour ward or birthing room which means that several women labour in the same room and give birth in one birthing room.

Study design

This study is part of a mixed-methods implementation research study that was conducted to identify health system constraints to the promotion of respectful maternity care and to develop and assess mitigation approaches. A pre-post study that involved no comparison group was undertaken between December 2017 and September 2018 to quantify changes in women's experiences of mistreatment during facility-based childbirth. Women who delivered in the study hospitals were surveyed at the time of discharge; the pre-intervention surveys were conducted in March 2018, whereas the post-intervention surveys were conducted in July and August 2018.

Description of the intervention

The intervention included: training of service providers, placement of wall posters in labour rooms, and post-training supportive visits for quality improvement. Each of these are described below.

The training of service providers involved a three-day workshop using a respectful maternity care training manual developed for this intervention. The manual was drafted by maternal health researchers from Ethiopia and Australia after review of previous respectful maternity care training manuals designed for low-income settings (Kenya[42], Tanzania[43], and Nigeria[44]), international human rights declarations[33, 45, 46], national professional codes of ethics, and national training manuals on maternity care and quality improvement. The manual includes an overview of maternal health in Ethiopia. It covers topics such as human rights and law in the context of reproductive health, respectful maternity care rights and standards, professional ethics, and continuous quality improvement. The draft manual was reviewed by three senior maternal health experts at the Federal Ministry of Health and SNNPR Health Bureau for its content and applicability in the Ethiopian context. Two rounds of three-day respectful maternity care training sessions were conducted at Hawassa University Comprehensive Specialized Teaching Hospital. The training was interactive and deployed various teaching methods including presentations, role plays, demonstrations, case studies, individual readings, video shows, and a hospital visit. Training sessions were facilitated by the principal investigator, a senior maternal health expert from the SNNPR health bureau, and a senior obstetrician-gynaecologist. A total of 64 health service providers participated in the training, 33 in the first round and 31 in the second round (all were staff from the participating hospitals). Fifty-two were midwives, whereas the remaining were integrated emergency surgical officers (4), general practitioners (3), nurses (3), and health officers (2). The SNNPR health bureau and hospital administrations communicated their expectation that all service providers at the participating hospitals who assist women during childbirth should attend the training. In reality, all eligible service providers from Adare (26) and Leku (21) hospitals attended the training sessions. Five

among the 22 eligible service providers from Yirgalem hospital did not attend the training sessions for personal reasons.

Five types of wall posters (four in English and one in Amharic) were distributed to the hospitals following completion of the service provider training. The posters were displayed in labour wards and waiting rooms to serve as job aids for service providers who are trained in English to become health professionals and who generally use service guidelines and reporting formats prepared in English. One of the English version wall posters lists the universal rights of childbearing women prepared by the White Ribbon Alliance.[33] The remaining three are infographics taken from the intrapartum care for a positive childbirth experience guideline prepared by the World Health Organization.[34] The Amharic version poster described the manifestations of mistreatment during facility-based childbirth and the universal rights of childbearing women endorsed by the Federal Ministry of Health, Ethiopia.

Two rounds of post-training quality improvement supportive supervision visits were conducted by the principal investigator and a senior maternal health expert in all hospitals at two-week intervals, in June and July of 2018. During the initial visit, a facility-led assessment of maternity care settings was conducted using a structured checklist that was part of the health providers' training [Supplementary file 1]. The checklist included 32 respectful maternity care standards that were assessed using observation, interview, and review of documents; the standards were grouped into five categories. Action plans were developed by service providers to address actionable gaps identified by the respectful maternity care standards assessment. The gaps that could not be addressed at the labour ward level were passed to hospital administrators for further actions [Supplementary file 1]. During the second visit, similar steps were undertaken to see changes as a result of the initial action plan and promote continuous quality improvement as a routine process. Detailed information on the sequencing of the interventions and the timing of data collection for the broader study, including the current study, is appended [Supplementary file 2].

Participants and procedures

Pregnant women who gave birth in the study hospitals were eligible for inclusion in the study regardless of their mode of delivery (natural or operative) or birth outcome. Once women had completed their discharge requirements and procedures, they were invited to participate in the study and were consecutively enrolled until the required sample size was achieved for each study hospital.

Sample size and sampling

Stata 14 software was used to calculate the sample size for this study using the menu option for determining the difference between two sample means with the assumption of: an anticipated mean count of mistreatment experiences women face in facility-based childbirth (pre-intervention) of 4.91, taken from a study conducted in Addis Ababa[26]; an anticipated mean count of mistreatment experiences women face in facility-based childbirth (post-intervention) of 3.96 (mean difference of 0.95); statistical power of 90%; an allocation ratio of 1:1 between the pre and post-intervention groups; 0.05 level of significance; and 10% non-response rate. Additionally, women receiving care in the same hospital are more likely to receive comparable care during childbirth, so the sample size was adjusted for clustering by assuming a clustering effect of 2. With these assumptions, the minimum required sample size was calculated to be 378 (189 in the pre-intervention group and 189 in the post-intervention group). Eventually, 392 women were invited and 388 women were surveyed (190 in the pre-intervention and 198 in the post-intervention) making the response rate 98.9%; rushing to go home and lack of interest to participate were the reasons for non-participation. Allocation of samples to the three hospitals was made proportionately depending on the number of women who delivered in the hospitals in the last quarter of 2017 for the pre-intervention survey, and the second quarter of 2018 for the post-intervention survey. Accordingly, 172 (87 pre-intervention, 85 post-intervention) women were surveyed from Adare hospital, whereas 86 (46 pre-intervention, 40 post-intervention) and 130 (65 pre-intervention, 65 post-intervention) were from Leku and Yirgalem hospitals,

respectively. Eligible women were enrolled into the study consecutively until the required sample size was met.

Variables and outcome measures

The survey included 25 questions about women's experiences of childbirth in the study hospitals (Table 1). The questions pertained to six categories: verbal abuse; physical abuse; non-consented care; lack of information, privacy and confidentiality; neglect and discrimination; and refusal of preference. The responses consisted of dichotomised mutually exclusive options set as "yes" or "no". The outcome variable was a count variable computed from the 25 variables clustered into the categories mentioned above; the number of mistreatment components women experienced were counted as a score out of 25; maximum possible score being 25 and minimum 0.

The main independent variable of the study was whether the woman belongs to the pre-intervention group or the post-intervention group, i.e. whether she was hospitalised before or after the intervention. The other independent variables, i.e. potential confounders that were considered for adjustment were: sociodemographic (place of residence, age, age at first marriage, marital status, educational status, occupation, religion, ethnicity, monthly income, number of children); obstetric characteristics (complication/s during pregnancy and delivery, type of delivery, intervention/s for vaginal delivery); service utilisation history (antenatal visits, history of facility-based delivery); service-related (referral status, time of admission, hours of stay, gender of service provider)

Questionnaire development

The survey questionnaire was developed as per the recommendations of a comparative analysis of five prevalence studies of mistreatment that were conducted in sub-Saharan Africa countries, including Ethiopia.[22] Additionally, the typology suggested by a mixed-methods systematic review on mistreatment during facility-based childbirth[23] was used to refine and group the 25 questions with some modifications. The questionnaire was originally prepared in

English and later translated into both Amharic and Sidamu Afo languages and back-translated to check for consistency [Supplementary file 3]. Subsequently, an electronic data collection template was prepared using the KoBoToolbox tool, and data collection was made using the KoBoCollect app for android devices.

Data collection

Data were collected by trained nurses and midwives who were fluent speakers of both Amharic and Sidamu Afo languages, recruited from Hawassa University Comprehensive Specialized Hospital. Data collectors received detailed three-day training on the purpose of the study, contents of the questionnaire and effective and ethical survey administration. The questionnaire was pre-tested on 15 women who delivered in Hawassa University Comprehensive Specialized Hospital which resulted in minor modifications to the questionnaire. Before conducting the post-intervention survey, data collectors received a one-day refresher training. To ensure data quality, the supervisor reviewed completed questionnaires for key contents before they were uploaded from the tablets to the server; the principal investigator cross-checked all uploaded questionnaires for consistency and completeness.

Data management and analysis

Data were exported to SPSS V.24 software for cleaning and later to StataSE v.15 software for analysis. The outcome variable, number of mistreatment components women experienced, was confirmed to follow the Poisson distribution by using a one sample independent Kolmogorov-Smirnov test ($p = 0.97$). Additionally, the mean (4.40) and variance (4.14) of the outcome variable were found to be close and thus suitable for Poisson modelling. Three models were constructed in this study: a null (intercept-only) model with the intercept as a fixed effect and random effects for hospitals (model I); a model containing the intervention as a fixed effect and random effects for hospitals (model II); and a model containing the intervention, sociodemographic, obstetric, and health service-related factors as fixed effects and random effects for hospitals (model III). The independent variables were checked for multicollinearity using the variance inflation factor (VIF). Hospital was set as a random-effects variable in all

models to take into account the likely absence of independence among women who received care from the same hospital. Analysis results from model III are reported in this study. A multilevel mixed effects Poisson regression analysis was conducted to identify the association between the independent and outcome variables while adjusting for possible confounders. The fixed effects (association measures) and random effects (variation measures) for the number of mistreatment components experienced are reported. Adjusted exponentiated regression coefficients (β) with their corresponding 95% confidence intervals (CI) were used to estimate the level of association between independent variables and the outcome variable. For comparison purpose, we also ran a fixed effects model with robust standard errors which included hospitals along with other variables of model III as fixed effects.

Patient involvement

Women who gave birth in the study hospitals during the survey periods were involved in the study. These women were not involved in research design, tool development, data analysis, and reporting.

Results

Demographics

Among the 388 women who participated in the study (198 pre-intervention, 190 post-intervention), there was no difference in the distribution of place of residence, age, age at first marriage, educational level, marital status, religion and ethnicity between the two groups (Table 2). Illiteracy and having a regular monthly income were higher in the post-intervention group. More than two thirds (70.1%) of women in the post-intervention group were housewives compared to 51% in the pre-intervention group, $p<.001$ (Table 2).

Obstetric characteristics

More than half of the participants in the pre-intervention (55.6%) and post-intervention (51.6%) groups were multiparous (Table 3). The majority of women delivered their previous child at a

health institution, 75.2% in the pre-intervention and 70.1% in the post-intervention group. Comparable levels of women in both groups had antenatal visits during their index pregnancy; however, having three or more antenatal visits was higher among women in the pre-intervention survey (82.4% vs 71.2%; *p*=.04). Complications during the index pregnancy were reported by 17.2% of women in the pre-intervention group and 10% in the post-intervention group (*p*=.04). Compared to women in the pre-intervention group, women in the post-intervention group were less likely to have had a vaginal delivery (77.4% vs 87.9%, *p*=.01) or an intervened vaginal delivery (39.5% vs 46.4%, *p*=.15) (Table 3).

Service characteristics

There was no difference between the pre- and post-intervention groups with respect to referral status and time of admission (Table 3). On the other hand, a higher proportion (52.5%) of women in the pre-intervention group delivered during the night-time than their counterparts (42.6%), *p*=.05. More than three-fifths (61.1%) of women in the pre-intervention group were assisted mainly by female service providers (51.6% in post-intervention group, *p*=.06) (Table 3).

Preference during childbirth

There were 86 (43.7%) women in the pre-intervention group who wanted to have a birth companion in the labour ward, while the proportion was only 17.9% in the post-intervention group (p<.001). Among those women who wanted to have a birth companion in the pre-intervention group, 14% were afraid to ask service providers to have one (23.5% in the post-intervention group). A higher proportion of women in the pre-intervention group wanted to adopt a preferred birthing position (34.9% vs 19.1%, *p*<.001) and cultural practice in the labour ward (21.7% vs 8.9%, *p*=.001). Additionally, more than half (51.2%) of women who wanted to have cultural practice in the pre-intervention group were afraid to ask service providers to have the practice (47.1% in the post-intervention group). The proportion of women who wanted to move around during birth and who wanted to have food or fluids during birth did not vary significantly between the two groups (Table 3).

Experiences of mistreatment

Almost all women (99.5% pre-intervention vs 99% post-intervention group) reported experiencing at least one type of mistreatment. The number of mistreatment types experienced ranged from one to 12 in the pre-intervention group (median = 5), and one to 11 in the post-intervention group (median = 3.5).

When the pre-intervention and post-intervention groups are compared, a number of improvements are evident. Vaginal examination was performed without permission for 47.9% of the women in post-intervention group; 64.7% in pre-intervention group (p=.001) (Table 1). Additionally, seeking women's consent before procedures, and the practice of allowing birth companions improved post-intervention. On the other hand, some aspects of mistreatment such as the use of harsh or rude language against women, gagging women, and leaving women for a prolonged period of time without attention did not improve significantly following the staff training. Additionally, more than two-thirds (67.9%) of women in the post-intervention group claimed that service providers did not give periodic updates on their labour (52.5% in the pre-intervention survey; p=.002) (Table 1).

We also compared the proportion of women who had encountered mistreatment grouped by six categories (verbal abuse; physical abuse; non-consented care; lack of information, privacy and confidentiality; neglect and discrimination; and refusal of preference). Women who reported having experienced at least one type of mistreatment in a given category were regarded as mistreated in that category. The level of non-consented care measured after the intervention (65.3%) is lower than before the intervention (83.3%), p<.001 (Table 1). Similarly, experiences of physical abuse and refusal of preference showed improvement after the intervention. No significant difference was detected in the level of the remaining three categories of mistreatment (Table 1).

Factors associated with the number of mistreatment components experienced

In the bivariate analysis, the number of mistreatment components experienced was higher among women who had a complication during the index delivery (Cβ = 1.16, 95%CI: 1.05-1.30) and an intervention for vaginal delivery (Cβ = 1.31, 95%CI: 1.20-1.44) (Table 4). Women who gave birth in Yirgalem hospital also experienced a higher number of mistreatment components (Cβ = 1.36, 95%CI: 1.22-1.51) compared to those who gave birth in Adare hospital. In contrast, the number of mistreatment components experienced was lower among women who had two or more deliveries and women who had a caesarean delivery (Table 4).

Multilevel analysis of changes in reported components of mistreatment

Outputs of the intercept-only model (model I) showed that there was significant variation between hospitals in the number of components of mistreatment experienced by women (Table 4). The intraclass correlation coefficient (ICC) of model I also revealed that 12.3% of the variation in the number of components of mistreatment experienced by women is attributable to differences across hospitals. Model II, a model with the main independent variable (intervention group), was different and fit as compared to model I (*p* for likelihood ratio (LR) test < 0.001). Furthermore, model III (a model that includes all the independent variables and the intervention group) was different and fit as compared to model II (*p* for LR test < 0.001). The ICC of model III shows a lower variation (9%) between the hospitals than models I and II. Model III displays the changes in the number of components of mistreatment experienced by participants of the two groups (pre-intervention and post-intervention) after adjusting for potential confounders.

As displayed in Table 4, the number of components of mistreatment experienced by women in the post-intervention group is lower by 18% than those in the pre-intervention group; adjusted regression coefficient (Aβ) = 0.82, 95%CI: 0.74-0.91. The fixed effects model with hospitals as predictors yielded the same effect size with a narrower CI (Aβ = 0.82, 95%CI: 0.76-0.89).

The number of components of mistreatment experienced by women was higher among women with complications during pregnancy (Aβ = 1.17, 95%CI: 1.01-1.34) or delivery (Aβ = 1.16, 95%CI: 1.03-1.32). Women who delivered by caesarean section after trial of vaginal delivery

(Aβ = 0.76, 95%CI: 0.63-0.92) and by caesarean section without trial of vaginal delivery (Aβ = 0.68, 95%CI: 0.47-0.98) experienced fewer number of mistreatment components. The number of mistreatment components experienced by women did not significantly vary by women's demographic, service-related, or other obstetric characteristics not already mentioned above (Table 4).

Discussion

This study was conducted as part of a mixed methods implementation research that aims to identify health system barriers to respectful maternity care and to propose and test mitigation approaches. To our knowledge, this study is the first to report on the effectiveness of a respectful maternity care intervention (facility-level) in Ethiopia. The study found that the number of mistreatment components experienced by women after the respectful maternity care intervention was reduced by 18% compared to the number experienced by women before the intervention. This is a notable improvement given the small-scale intervention we implemented and the known limitations of interventions focused primarily on training health workers.[47] Training of service providers alone cannot be a solution to address mistreatment unless other system elements that significantly influence the behaviour of service providers are also addressed.

Similar implementation studies have been conducted in response to the growing attention to mistreatment and the need to identify recommendations to eliminate mistreatment. The *Heshima* study (Kenya)[39] and the *Staha* study (Tanzania)[41] were conducted to assess the impact of respectful maternity care interventions on the level of mistreatment. The *Heshima* study involved a multi-component respectful maternity care intervention (policy, facility, and community level); 7% reduction in the prevalence of mistreatment was reported following the intervention.[39] The *Staha study* involved community level (client service charter) and facility-level (quality improvement inventory and intervention in maternity wards) interventions, and reported a 66% reduction in the odds of women reporting mistreatment after the intervention.[41] Both *Heshima* and *Staha* studies used a prevalence measure of mistreatment; women who

faced at least one form of mistreatment were labelled as mistreated. Considering women who encountered at least one form of mistreatment as mistreated in these studies may have resulted in the underestimation of the magnitude of change.

In this study, the proportion of women who experienced non-consented care, physical abuse, and refusal of preference was significantly lower in the post-intervention group. No significant difference was observed in the proportion of women who experienced mistreatment in the remaining three categories of mistreatment (verbal abuse; lack of information, privacy and confidentiality; and neglect and discrimination). The very high proportion of women who reported 'non-consented care' suggests that the issue of obtaining consent is not well understood by the staff (and probably by the hospital administration also). Similarly, the very high proportion of women who reported 'lack of information, privacy and confidentiality' and 'refusal of preferences' suggests a poor understanding of these concepts and rights among providers. These are areas that need to be integrated and foregrounded into professional development/quality improvement programs for all levels of staff and the pre-service training of health professionals. Additionally, the high level of mistreatment among women who had complications during delivery, and assisted vaginal delivery might be explained by the fact that several cadres attend women during such events.

According to the *Health Workers for Change* study conducted in four African countries, structural issues such as shortage/lack of manpower and supplies, and poor working conditions inhibit implementation of change interventions.[48] According to the Bowser and Hill framework[49], structural constraints not only impede change initiatives, they also independently contribute to mistreatment. Thus, the categories of mistreatment that were likely to have been a product of these structural issues were not influenced by the intervention because it lacked a structural dimension.

The fact that there is no private labour room combined with the increased presence of birth companions after the intervention may explain the relative lack of improvement in women's

privacy. Adequate preparation and adaptation of labour wards is recommended before operationalizing birth companionship in resource-limited contexts.[34, 50] Lunze and colleagues reviewed 259 (83 sub-Saharan Africa based) studies and reports of innovative approaches for improving maternal and newborn health, using the lens of WHO's health system building blocks. The review revealed that interventions in one health system building block affected other building blocks; the review recommends a system-wide intervention to maximize the effectiveness and sustainability of interventions.[51] Similarly, WHO also recommends that respectful maternity care should be viewed through the lens of systems thinking when prioritizing action areas to improve quality of care.[36]

What makes the *Staha* study similar to our study is that, no changes in the level of verbal abuse and neglect and discrimination were observed after the intervention.[41] This might be explained by the fact that ingrained negative and normalized behaviours require time to change and are highly associated with age and experience of service providers, younger and less experienced providers being less supportive during labour.[52] On the contrary, if a proactive focus on respectful care is provided during pre-service training to younger graduates, who are usually motivated for change, it may nurture respectful behaviour.[53] Additionally, other factors such as uncomfortable working circumstances, overcrowded facilities, space constraints, and poorly motivated staff are not only barriers to the implementation of new guidelines[54] but also contributors to mistreatment.[49] These factors may have contributed to the steady level of the mistreatment components that did not improve in the current study.

Evidence suggests that women's chosen birth companionship contributes to positive birth outcomes for both the mother and the newborn[55] and is recommended by the WHO.[34] In this study, among 120 women who wanted to have a birth companion, only 18(15%) were allowed to have their chosen companion (11.6% in pre-intervention vs 23.5% in post-intervention group). Additionally, 16.7% (14% in pre-intervention vs 23.5% in post-intervention group) of those who would have wanted to have a companion were afraid to ask service providers about this. These unexpressed preferences highlight that facilities and service providers should promote

companionship rather than wait for the request to come from women.[34, 55] And this should be supported by political commitment, high-level advocacy, and operating guidelines.[56] The proportion of women who reported to have their preference during childbirth in the post-intervention survey was lower than that of pre-intervention survey participants; this may be due to the high proportion of women who had a caesarean birth in the post-intervention survey.

In this study, comparing the number (counts) of mistreatment components women experienced helped to identify the changes in the extent or diversity of mistreatment that would not have been possible to identify by simple prevalence measures. Additionally, treating hospitals as random-effects in the statistical model controls for the impact of other interventions that may have happened around the same time in those facilities. The absence of difference in demographic and obstetric characteristics between women of the two groups (pre-intervention and post-intervention) also adds to the soundness of the statistical analysis used to detect changes in mistreatment. Additionally, where women are admitted in a shared ward, comparing the proportion of women mistreated rather than comparing the counts of mistreatment fails to detect changes that might have resulted after an intervention. This is because, there are components of mistreatment that cannot be totally prevented without major structural changes, for example, provision of adequate space to ensure privacy and confidentiality.[40]

One of the limitations of this study is that the mistreatment components experienced by women repeatedly were counted only once as binary response options (yes/no) questions were used. This approach fails to capture multiple incidents of mistreatment components experienced by women, for example, how many times a woman was verbally abused. Additionally, it might have also led to the underestimation of the intervention effect size. To overcome such problems, using questions with frequency response options is recommended. A survey of women at their exit, as in this study, is prone to recall bias in acquiring data on multiple incidents; instead, independent observation in the labour room would be more appropriate.[57] However, observation also has inherent limitations, e.g. the Hawthorne effect—service providers modify their behaviour and become less disrespectful because they know they are being observed.

Pertaining to the generalizability of findings, because the study was conducted only in three hospitals located in the SNNPR, the findings may not be generalizable to other types of hospitals, health centres, and clinics that provide childbirth services in Ethiopia. Additionally, the short washout period and the lack of a control group in this study is a key limitation as it is not possible to attribute with certainty the changes observed to the respectful maternity care intervention.

Finally, we believe that this study being the first to test the effectiveness of a respectful maternity care intervention in Ethiopia, contributes to evidence for further endeavours to improve respectful maternity care specifically, and the quality of childbirth services generally. Thorough implementation studies that are designed to capture macro and micro level contributors to mistreatment need to be conducted to inform evidence-driven actions to eliminate mistreatment during facility-based childbirth in Ethiopia.

Conclusions

This study revealed that the childbirth services women received in the study hospitals were characterized by a wide range of mistreatment behaviours and/or health facility conditions. The respectful maternity care intervention tested in this study was accompanied by a reduction in women's experience of mistreatment during facility-based childbirth. Given the variety of factors that lead to mistreatment in health facilities, interventions designed to mitigate mistreatment need to be multidimensional—including demand-side (community level), supply-side (health system level), and policy-level interventions. We believe that this study adds to existing knowledge on innovations that can be used to mitigate mistreatment. Further research is needed to investigate the impact and sustainability of health system-level interventions on women's experiences of mistreatment during facility-based childbirth.

Acknowledgements

We would like to pass our heartfelt thanks to experts at the Federal Ministry of Health, the SNNPR Health Bureau, and Hawassa University College of Medicine and Health Sciences who

reviewed the respectful maternity care training manual and coordinated the training sessions. We also extend our appreciation to all participants of the study, service providers, and facility administrations for being an active player in the smooth operation of the study. Members of the data collection team also deserve a warm appreciation for their engagement.

Contributors

AA conceived the study; AA, AM and MK designed the study, developed data collection tools; AA trained data collectors, coordinated the fieldwork; AA, SA, HM, ET and SG conducted the intervention; AA, AM and MK analysed the data; AA, AM and MK drafted the manuscript; SA, HM, ET and SG revised the manuscript for intellectual content. All authors have read and approved the manuscript.

Funding

The training of service providers was made possible by support from the Institute of Healthcare Improvement (IHI) through the Federal Ministry of Health, Ethiopia. The primary author of this study is the recipient of the Melbourne Research Scholarship (University of Melbourne), and the Population Health Investing in Research Students' Training (PHIRST) travel grant (Melbourne School of Population and Global Health, University of Melbourne). The contents of this research article only reflect the authors' opinions but do not show interest/s of either of the organizations involved in the funding.

Competing interests

The authors declare that they have no competing interests

Ethics approval

Ethics approval was obtained from the Institutional Review Board (Ethics ID: 3-12/12926) located in SNNPR Health Bureau, Ethiopia and the Human Ethics Sub-Committee (Ethics ID: HESC 1750054) at the University of Melbourne, Australia. Permission letter to conduct this study was also granted from the Federal Ministry of Health and SNNPR Health Bureau.

Information about the study was delivered to all study participants in local languages and written consent was obtained.

Data sharing statement

Reasonable requests can be made to access study data from the corresponding author.

Word count: 5688

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Table 1 Women's experience of mistreatment during childbirth

Types of mistreatment experienced	Pre-intervention n (%)	Post-intervention n (%)	*p*-value for χ^2
Verbal abuse	17 (8.6)	11 (5.8)	0.29
Health workers used harsh or rude language	8 (4.0)	6 (3.2)	0.64
Health workers made judgmental or accusatory comments about woman	8 (4.1)	2 (1.1)	0.06
Health workers made threats of withholding treatment	1 (0.5)	2 (1.1)	0.54
Health workers blamed woman for any features of birth outcome	4 (2.0)	4 (2.1)	0.95
Physical abuse	33 (16.7)	17 (8.9)	0.02*
Woman was beaten, slapped, kicked, or pinched	7 (3.5)	5 (2.6)	0.61
Woman was gagged	19 (9.6)	11 (5.8)	0.16
Woman was restrained	19 (9.6)	9 (4.74)	0.06
Non-consented care	165 (83.3)	124 (65.3)	<0.001*
Health workers did not obtain consent for procedure/s	138 (69.7)	84 (44.2)	<0.001*
Health workers ever separated woman from her baby without explaining	14 (7.1)	7 (3.7)	0.14
Health workers did not ask woman's permission before conducting vaginal examination	128 (64.7)	91 (47.9)	0.001*
Health workers did not ask woman's permission before performing surgery (episiotomy or caesarean section) (n=220)	69 (65.1)	44 (38.6)	<0.001*
Health workers made woman stay in the hospital against her will	4 (2.0)	2 (1.1)	0.44
Lack of information, privacy and confidentiality	189 (95.5)	182 (95.8)	0.88
Health workers did not keep woman's information confidential	18 (9.1)	7 (3.7)	0.03*
Health workers conducted vaginal examination without maintaining woman's privacy	162 (81.8)	147 (77.4)	0.28
Health workers did not give periodic updates on woman's labour	104 (52.5)	129 (67.9)	0.002*
Health workers spoke to woman in a language she could not understand	5 (2.5)	9 (4.7)	0.24
Neglect and discrimination	24 (12.1)	17 (8.9)	0.31
Health workers did not always come following woman's call	8 (4.0)	7 (3.7)	0.86
Woman was ever left for a prolonged period of time without attention	19 (9.6)	12 (6.3)	0.23
Health worker was not present for the actual birth of woman's baby	5 (2.5)	3 (1.6)	0.51
Health workers discriminated woman based on her attribute	-	2 (1.1)	-
Refusal of preference	134 (67.7)	104 (54.7)	0.01*
Health workers did not allow woman to have a birth companion present	64 (86.5)	18 (69.2)	0.04*
Health workers did not allow woman to move around during labour	43 (76.7)	63 (94.3)	0.002*
Health workers did not allow woman to have foods or fluids	66 (94.3)	62 (98.4)	0.21
Health workers did not allow woman to deliver in her preferred position	43 (66.2)	12 (33.3)	0.001*
Health workers did not allow woman to have cultural practice in labour	16 (76.2)	0 (-)	-

Table 2 Women's sociodemographic characteristics

Variables		Pre-intervention n (%)	Post-intervention n (%)	*p*-value for χ^2
Place of residence	Urban	125 (63.1)	119 (62.6)	0.92
	Rural	73 (36.9)	71 (37.4)	
Age in completed year	15-24	98 (49.5)	96 (50.5)	0.93
	25-34	89 (45.0)	85 (44.8)	
	35-44	11 (5.5)	9 (4.7)	
	Median (IQR)	25 (7)	24 (8)	
Age at first pregnancy	Median (IQR)	20 (4)	20 (4)	0.72
Educational level	No formal education	29 (14.7)	38 (20.0)	0.13
	Primary education	81 (40.9)	74 (39.0)	
	Secondary education	48 (24.2)	54 (28.4)	
	College and above	40 (20.2)	24 (12.6)	
Marital status	Single	2 (1.0)	1 (0.5)	0.86
	Married	195 (98.5)	188 (99.0)	
	Separated	1 (0.5)	1 (0.5)	
Religion	Christian Protestant	140 (70.7)	141 (74.2)	
	Christian Orthodox	27 (13.6)	27 (14.2)	0.29
	Christian Catholic	7 (3.5)	2 (1.0)	
	Muslim	17 (8.6)	10 (5.3)	
	Others	7 (3.6)	10 (5.3)	
Ethnicity	Sidama	139 (70.2)	128 (67.4)	0.20
	Oromo	7 (3.5)	15 (7.9)	
	Amhara	13 (6.6)	17 (9.0)	
	Wolayita	17 (8.6)	17 (9.0)	
	Others	22 (11.)	13 (6.8)	
Occupation	Housewife	101 (51.0)	134 (70.5)	< 0.001
	Private employee	8 (4.0)	8 (4.21)	
	Government employee	36 (18.2)	29 (15.3)	
	Private business	41 (20.7)	13 (6.8)	
	Others	12 (6.1)	6 (3.2)	
Respondent has regular	Yes	89 (45.0)	69 (36.3)	0.08
monthly income*	< 1552 Br	34 (38.2)	25 (36.2)	0.8
	≥ 1552 Br	55 (61.8)	44 (63.8)	
	Median (IQR)	2000 (2015)	2000 (1900)	
	No	109 (55.0)	121 (63.7)	

**1USD = 27.23 Br (Average between March and August 2018)*

Table 3 Women's obstetric and maternal healthcare characteristics and preferences during childbirth

Variables		Pre-intervention n (%)	Post-intervention n (%)	*p*-value for χ^2
Total number of deliveries	One	88 (44.4)	92 (48.4)	0.43
	Two or more	110 (55.6)	98 (51.6)	
	Median (IQR)	2 (1)	2 (2)	
Place of delivery of previous child (n=206)	Health facility	82 (75.2)	68 (70.1)	0.41
	Outside health facility	27 (24.8)	29 (29.9)	
Number of previous facility-based deliveries	None	22 (20.2)	22 (22.5)	
	One	69 (63.3)	53 (54.0)	
	Two and more	18 (16.5)	23 (23.5)	
	Median (IQR)	1 (0)	1 (0)	
Antenatal visit during index pregnancy	Yes	188 (94.9)	184 (96.8)	0.35
	One	5 (2.7)	9 (4.9)	0.04
	Two	28 (14.9)	44 (23.9)	
	Three or more	155 (82.4)	131 (71.2)	
	No	10 (5.1)	6 (3.2)	
Experienced complication during index pregnancy	Yes	34 (17.2)	19 (10.0)	0.04
	No	164 (82.8)	171 (90.0)	
Experienced complication during index delivery	Yes	67 (34.0)	70 (36.8)	0.56
	No	130 (66.0)	120 (63.2)	
Referral status on admission	Referred	81 (40.9)	86 (45.3)	0.39
	Non-referred	117 (59.1)	104 (54.4)	
Time of admission*	Day time	106 (53.5)	99 (52.1)	0.78
	Night-time	92 (46.5)	91 (47.9)	
Time of delivery*	Day time	94 (47.5)	109 (57.4)	0.05
	Night-time	104 (52.5)	81 (42.6)	
Type of delivery	Vaginal delivery	174 (87.9)	147 (77.4)	0.01
	Caesarean after trial of vaginal delivery	18 (9.1)	38 (20.0)	
	Caesarean without trial of vaginal delivery	6 (3.0)	5 (2.6)	
Had intervention/s for vaginal delivery (n=377)**	Yes	89 (46.4)	73 (39.5)	0.15
	No	101 (53.6)	111 (60.5)	
Types of assisted vaginal delivery (n=162)[§]	Vacuum extraction	12 (13.5)	9 (12.3)	0.83
	Forceps delivery	8 (9.0)	2 (2.7)	0.10
	Episiotomy	82 (92.1)	71 (97.3)	0.16
Gender of main service provider	Female	121 (61.1)	98 (51.6)	0.06
	Male	77 (38.9)	92 (48.4)	
Woman wanted to have birth companion in the labour ward	Yes	86 (43.7)	34 (17.9)	<0.001
	No	111 (56.5)	156 (82.1)	
Woman wanted to move around during birth	Yes	57 (28.8)	67 (35.5)	0.16
	No	141 (71.1)	122 (64.5)	
Woman wanted to have food or fluids during birth	Yes	70 (35.4)	63 (33.2)	0.65
	No	128 (64.6)	127 (66.8)	

Woman had a preferred birthing position	Yes	69 (34.9)	36 (19.1)	<0.001
	No	129 (65.1)	153 (80.9)	
Woman wanted to have cultural practice in labour	Yes	43 (21.7)	17 (8.9)	0.001
	No	155 (78.3)	173 (91.1)	

**Stayed in hospital for at least two hours between 8pm and 8am immediately before childbirth*

***Includes: Episiotomy, vacuum extractor or forceps*

[§]a woman can have more than one procedure

Table 4 Multilevel mixed-effects regression of counts of mistreatment experienced by women

Variables	Bivariate model Cβ (95% CI)	Model I Aβ (95% CI)	Model II Aβ (95% CI)	Model III Aβ (95% CI)
A) Fixed effects				
(Intercept)		4.32 (3.60, 5.12)	**4.82 (3.98, 5.84)***	7.18 (3.34, 15.44)
Intervention group				
Pre-intervention	Ref.		Ref.	Ref.
Post-intervention	0.79 (0.72, 0.87)		**0.79 (0.72, 0.87)***	**0.82 (0.74, 0.91)***
Place of residence				
Urban	Ref.			Ref.
Rural	1.11 (1.00, 1.22)			1.05 (0.93, 1.19)
Age in completed year				
15-24	Ref.			Ref.
25-34	**0.85 (0.77, 0.94)***			0.95 (0.82, 1.09)
35-44	**0.74 (0.58, 0.94)***			0.81 (0.61, 1.08)
Age at first pregnancy	**1.03 (1.01, 1.04)***			1.01 (0.99, 1.03)
Marital status				
Single	Ref.			Ref.
Married	0.77 (0.48, 1.25)			0.79 (0.45, 1.39)
Separated	1.24 (0.61, 2.51)			1.06 (0.49, 2.31)
Religion				
Christian Protestant	Ref.			Ref.
Christian Orthodox	0.91 (0.78, 1.04)			0.93 (0.76, 1.12)
Christian Catholic	1.01 (0.74, 1.38)			1.01 (0.73, 1.40)
Muslim	1.04 (0.87, 1.25)			1.07 (0.88, 1.31)
Others	**0.70 (0.54, 0.93)***			0.80 (0.60, 1.07)
Ethnicity				
Sidama	Ref.			Ref.
Oromo	0.90 (0.73, 1.12)			0.93 (0.72, 1.19)
Amhara	0.87 (0.72, 1.05)			0.98 (0.77, 1.25)
Wolayita	0.96 (0.81, 1.14)			1.13 (0.92, 1.40)
Others	1.02 (0.86, 1.20)			1.00 (0.81, 1.24)
Educational level				
No formal education	Ref.			Ref.
Primary education	1.11 (0.96, 1.27)			0.99 (0.84, 1.15)
Secondary education	1.05 (0.90, 1.22)			0.98 (0.81, 1.18)
College and above	1.18 (1.00, 1.39)			1.07 (0.84, 1.38)
Occupation				
Housewife	Ref.			Ref.
Private employee	1.06 (0.84, 1.35)			1.06 (0.77, 1.47)
Government employee	1.01 (0.89, 1.16)			0.95 (0.72, 1.25)
Private business	1.00 (0.87, 1.16)			1.01 (0.80, 1.27)
Others	1.14 (0.91, 1.41)			0.90 (0.69, 1.16)
Has regular monthly income*				
No	Ref.			Ref.
Yes	0.95 (0.86, 1.04)			0.92 (0.75, 1.13)
Total number of deliveries				
One	Ref.			Ref.
Two or more	**0.76 (0.69, 0.84)***			0.86 (0.74, 1.02)
Antenatal visit during index pregnancy				
No	Ref.			Ref.
Yes	0.82 (0.66, 1.02)			0.95 (0.74, 1.22)
Experienced complication during index pregnancy				
No	Ref.			Ref.
Yes	**1.35 (1.19, 1.53)***			**1.17 (1.01, 1.34)**
Experienced complication during index delivery				

No	Ref.			Ref.
Yes	**1.16 (1.05, 1.30)***			**1.16 (1.03, 1.32)***
Referral status on admission				
Referred	Ref.			Ref.
Non-referred	0.93 (0.85, 1.02)			1.07 (0.94, 1.21)
Total hours of stay	1.00 (0.99, 1.00)			1.00 (0.99, 1.00)
Gender of main service provider				
Female	Ref.			Ref.
Male	1.05 (0.95, 1.16)			1.03 (0.93 1.16)
Type of delivery				
Vaginal delivery	Ref.			Ref.
Caesarean after trial of vaginal delivery	**0.78 (0.67, 0.90)***			**0.76 (0.63, 0.92)***
Caesarean without trial of vaginal delivery	**0.67 (0.48, 0.95)***			**0.68 (0.47, 0.98)***
Had intervention for vaginal delivery				
No	Ref.			Ref.
Yes	**1.31 (1.20, 1.44)***			1.04 (0.91, 1.19)
B) Random effects				
Hospital				
Variance		0.02 (0.01-0.14)*	0.03 (0.001-0.14)*	-
ICC (%)		12.3	13.6	9.0
C) Model fitness				
AIC		1600	1577	1570
Log Likelihood		-798	-786	-750
P value		-	< 0.001	< 0.001

- *Significant at p<.05*

Abbreviations: ***β*** *exponentiated regression coefficient,* ***Cβ*** ***crude exponentiated regression coefficient,*** ***Aβ*** ***adjusted exponentiated regression coefficient,*** ***CI*** *confidence interval,* ***ICC*** *Intraclass correlation,* ***AIC*** *Akaike's information criterion*

Supplementary file 1

Facility-led respectful maternity care assessment checklist for continuous quality improvement

RMC standards	Measurement criteria O: observation; I: interview; RD: review of documents		NA	Remark
The woman is protected from verbal abuse	[ ]	1. Uses polite language, avoids use of harsh or rude language **(O)**		
	[ ]	2. Does not make judgmental or accusatory comments **(O)**		
	[ ]	3. Does not make threats to withhold treatment **(O)**		
	[ ]	4. Does not blame a woman for any feature of her birth outcome/s **(O)**		
Score	___**of** ___			
The woman is protected from physical abuse	[ ]	1. Does not beat, slap, kick, or pinch a woman **(O)**		
	[ ]	2. Does not deny a woman to cry or scream during labor **(O)**		
	[ ]	3. Does not restrain (tie) a woman **(O)**		
Score	___**of** ___			
The woman is not stigmatized or discriminated	[ ]	1. Serves a woman respectfully regardless of her religion/race/ethnicity/age/socioeconomic status/medical condition **(O/I)**		
	[ ]	2. Serves a woman respectfully regardless of her medical condition **(O/I)**		
Score	___**of** ___			
The woman received professional standard of care	[ ]	1. Seeks for woman's consent prior to performing any procedure **(O)**		
	[ ]	2. Never shouts loudly when communicating woman's information to other staff **(O/I)**		
	[ ]	3. Keeps woman's personal information secure (**O/I/RD)**		
	[ ]	4. Performs vaginal examination very gently to minimize pain **(O/I)**		
	[ ]	5. Maintains woman's privacy while performing vaginal examination **(O/I)**		
	[ ]	6. Gives a woman pain relief when she needs it **(O/I)**		
	[ ]	7. Obtains woman's consent before preparing her for surgery **(O/I)**		
	[ ]	8. Responds to a woman immediately following her call **(O/I)**		
	[ ]	9. Never leaves a woman alone during labour **(O/I)**		
Score	___**of** ___			
	[ ]	1. Introduces himself/herself to a woman when he/she first meet her **(I/O)**		

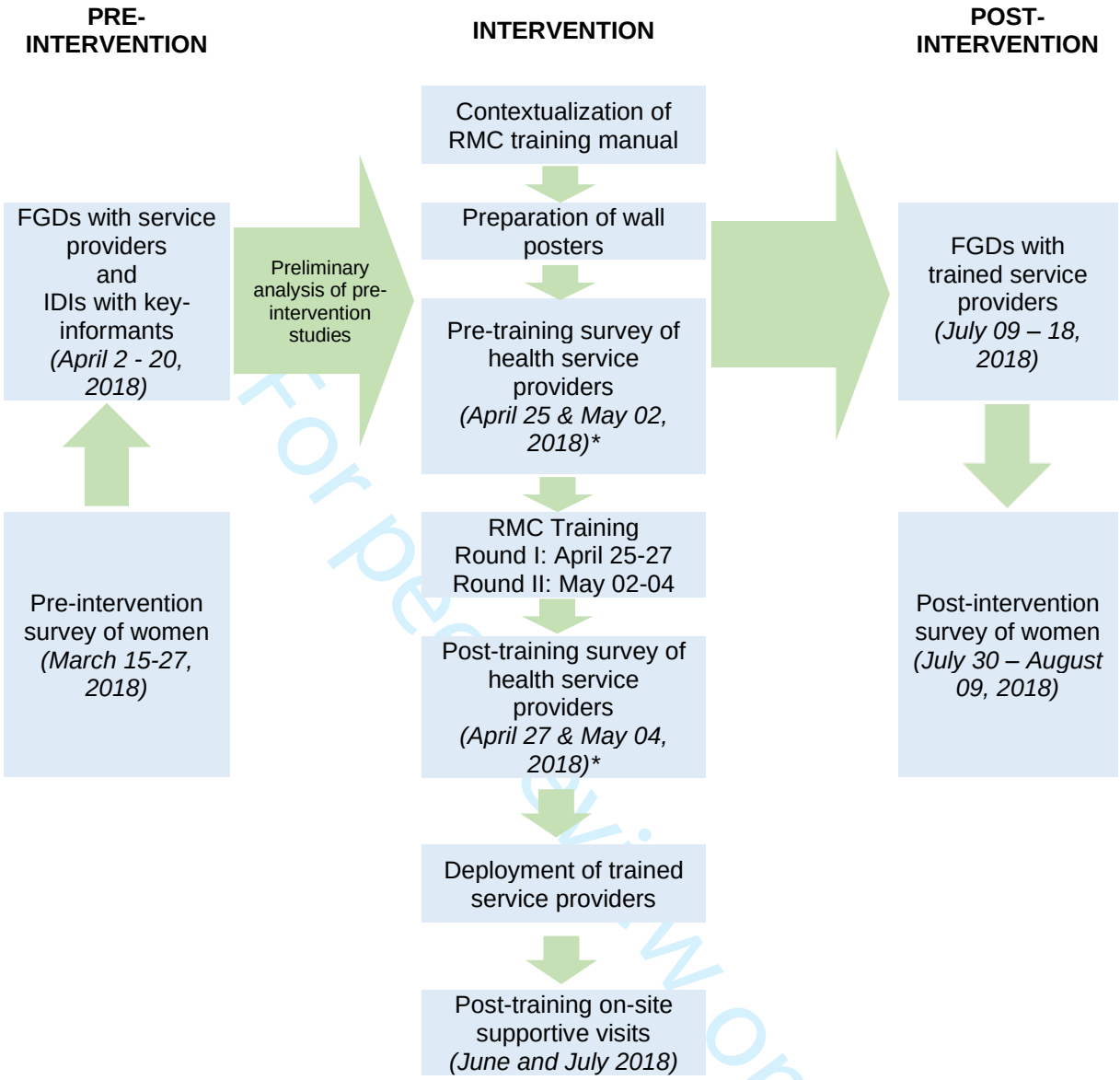
The woman received care with good provider rapport and communication	[ ]	2. Serves a woman in a polite manner **(I/O)**		
	[ ]	3. Does not ignore woman's concern/s while she is in labor **(I/O)**		
	[ ]	4. Speaks to a woman in a clear language **(I/O)**		
	[ ]	5. Gives a woman periodic updates of progress of labor **(O/I)**		
	[ ]	6. Gives credit to every effort a woman makes in labor **(O/I)**		
	[ ]	7. Allows a woman to move around during labor unless there is an indication to deny her **(O/I)**		
	[ ]	8. Allows a woman to take food or fluids if there is no other indication to deny her **(I/O)**		
	[ ]	9. Allows woman's birth companions for companionship **(I/O)**		
	[ ]	10. Allows a woman to assume position of her choice during labor **(I/O)**		
	[ ]	11. Allows a woman any cultural practice she wants to practice in labor **(I/O)**		
	[ ]	12. Does not objectify a woman in labor **(I/O)**		
	[ ]	13. Does not make a woman stay in the hospital without her will **(I/O)**		
	[ ]	14. Keeps a baby with his mom unless there is another indication **(O/I)**		
Score	___**of** ___			
Grand score	___**of** ___			

NA: Not applicable

Action plan matrix to improve respectful maternity care

Indicator (intended target)	Possible cause (key causes)	Action taken (test action)	Responsible person	Support required	Timeline (dd/mm/yy)	Evaluate/ lesson learned (study)	Action for the next cycle
I: T:	C1: C2:						□Modify □Expand □Drop

Supplementary file 2: Order of studies and timing of data collection



RMC-respectful maternity care
**RMC training was conducted in two rounds from 25-27 April 2018 and 02-04 May 2018.*
The post intervention FGDs and the post-intervention survey of women providers were conducted after the intervention has been completed

RMC women's survey

Dear data collector, please read the plain language summary and seek for participants consent before proceeding to the survey

Did the woman agree to participate?

- ◯ Yes
- ◯ No

Name of data collector

- ◯ Helen
- ◯ Lemlem
- ◯ Maereg

Interview code (three digits)

_____

Hospital

- ◯ Adare
- ◯ Leku
- ◯ Yirgalem

101. Place of residence

- ◯ Urban Kebele
- ◯ Rural kebele

102. Age in completed years

_____

103. Age at first pregnancy (in years)

_____

104. Marital status

- ◯ Single
- ◯ Married
- ◯ Separated
- ◯ Divorced
- ◯ Widowed

105. Religion

- ◯ Protestant, christian
- ◯ Orthodox, christian
- ◯ Muslim
- ◯ Christian Catholic
- ◯ Others

106. Ethnicity

- ◯ Sidama
- ◯ Amhara
- ◯ Oromo
- ◯ Wolayita
- ◯ Others

107. Educational status

- ◯ No formal education
- ◯ Some primary - did not complete grade 8
- ◯ Completed grade 8
- ◯ Some secondary - did not complete grade 12
- ◯ Completed grade 12
- ◯ More than secondary

108. Occupation

- ◯ Housewife
- ◯ Farmer
- ◯ Private employee
- ◯ Government employee
- ◯ Private business
- ◯ Others

109. How many children do you have?

_____

110. Do you have regular household monthly income?

- ◯ Yes
- ◯ No

111. Estimated monthly income (in birr)

201. How many times have you delivered before? (including current one)

_____

202. Where did you deliver your last (previous) child?

- Health facility
- Home
- Traditional birth attendant's home
- On my way to health facility

203. How many times have you delivered in health facility? (excluding current one)?

_____

204. Did you have antenatal care visit during your current pregnancy?

- Yes
- No

205. How many antenatal care visits did you have?

- One
- Two
- Three or more
- Don't remember

206. Did you have any complication during your current pregnancy?

- Yes
- No
- I don't know

207. Did you have any complication during your current labor and delivery?

- Yes
- No

301. Were you referred from other facility or directly came here in?

- Referred
- Non-referred

302. What time did you get admitted to the hospital?

yyyy-mm-dd _____ hh:mm _____

303. What time did you deliver?

yyyy-mm-dd hh:mm

304. What type of ward were you admitted in?

- ◯ Private ward
- ◯ Shared ward

305. What was gender of the service provider who mainly assisted you in labor?

- ◯ Female
- ◯ Male

306. What type of birth did you have?

- ◯ Vaginal birth
- ◯ Caesarean birth after labour trial
- ◯ Caesarean birth without labour trial

307. Did you have any procedure for an assisted delivery?

- ◯ Yes
- ◯ No

308. Which procedure did you receive? (Multiple responses possible)

- ☐ Vacuum
- ☐ Forceps
- ☐ Episiotomy

401. Did the health workers use harsh or rude language?

- ◯ Yes
- ◯ No

402. Did the health workers make judgmental or accusatory comments about you?

- ◯ Yes
- ◯ No

403. Were you beaten, slapped, kicked, or pinched during childbirth?

- ◯ Yes
- ◯ No

404. Were you gagged during childbirth?

- ◯ Yes
- ◯ No

405. Were you physically restrained during childbirth?

- ◯ Yes
- ◯ No

406. Did the health workers make threats of withholding treatment?

- ◯ Yes
- ◯ No

407. Did the health workers blame you for any feature of your birth outcomes?

- ◯ Yes
- ◯ No

408. Did the health workers obtain your consent for all procedures?

- ◯ Yes
- ◯ No

409. Did the health workers keep information about you confidential?

- ◯ Yes
- ◯ No

410. Did you have any surgical procedure (episiotomy, cesarean section)?

- ◯ Yes
- ◯ No

411. Did the health worker ask your permission before performing surgery?

- ◯ Yes
- ◯ No

412. Did the health workers always come following your call?

- ◯ Yes
- ◯ No

413. Were you ever left for a prolonged period of time without attention during your labour?

- ◯ Yes
- ◯ No

414. Was a health provider present for the actual birth of your baby?

- ◯ Yes
- ◯ No

415. Did the health workers ever separate you from your baby without explaining the reason?

- ◯ Yes
- ◯ No

416. Did the health workers ask your permission before conducting a vaginal examination?

- ◯ Yes
- ◯ No

417. Did any health worker conduct vaginal examination without maintaining your privacy?

- ◯ Yes
- ◯ No

418. Did the health workers speak to you in a language you do not understand?

- ◯ Yes
- ◯ No

419. Did the health workers give you periodic updates on your labor?

- ◯ Yes
- ◯ No

420. Did you want to have a birth companion in the labor ward?

- ◯ Yes
- ◯ No

421. Did the health workers allow you to have your birth companion present?

- ◯ Yes
- ◯ No
- ◯ I was afraid to ask

422. Did you want to move around during your labor?

- ◯ Yes
- ◯ No

423. Did the health workers allow you to move around during your labor?

- ◯ Yes
- ◯ No

424. Did you want to have food or fluids during your labor?

- ◯ Yes
- ◯ No

425. Did the health workers allow you to have food or fluids?

- ◯ Yes
- ◯ No

426. Did you have a preferred birthing position?

- ◯ Yes
- ◯ No

427. Did the health workers allow you to deliver in your preferred position?

- ◯ Yes
- ◯ No
- ◯ I was afraid to ask

428. Did you want to have a cultural practice in labor?

- ◯ Yes
- ◯ No

429. Did the health workers allow you this cultural practice in labor?

- ◯ Yes
- ◯ No
- ◯ I was afraid to ask

430. Did the health workers make you stay in the hospital against your will?

- ◯ Yes
- ◯ No

431. Did the health workers discriminate you based on your religion /ethnicity/age/socioeconomic status/medical condition?

- ◯ Yes
- ◯ No

RMC women's survey

ከመጀመርሽ በፊት የጥናቱን ዓላማ እዚህ ላይ በተጻፈው በማስረዳት የተሳታፊዋን ፈቃድ ጠይቂ

የጥናቱ ተጋባዥ ለመሳተፍ ፈቃደኛ ናት?

- አዎ
- አይ

የመረጃ ሰብሳቢ ስም

- ሔለን
- ለምለም
- ማዕረግ

የቃለ መጠይቅ ኮድ

_____

የሆስፒታል ስም

- አዳሬ
- ለኩ
- ይርጋዓለም

101. የመኖሪያ አድራሻ

- የከተማ ቀበሌ
- የገጠር ቀበሌ

102. ዕድሜ

_____

103. ለመጀመሪያ ጊዜ ያረገዙት በስንት እድሜዎት ነው?

_____

104. የጋብቻ ሁኔታ

- ያላገባች
- ያገባች
- የተለያየች
- የተፋታች
- ባሏ የሞተባት

105. ሃይማኖት

- ፕሮቴስታንት
- አርቶዶክስ
- ሙስሊም
- ካቶሊክ
- ሌላ

106. ብሔር

- ሲዳማ
- አማራ
- ኦሮሞ
- ወላይታ
- ሌላ

107. የትምህርት ደረጃ

- ያልተማረች
- አንደኛ ደረጃ (1-8)
- ስምንተኛ ክፍል ያጠናቀቀች
- ሁለተኛ ደረጃ (9-12)
- አሥራ ሁለተኛ ክፍል ያጠናቀቀች
- ከአሥራ ሁለተኛ ክፍል በላይ

108. የሥራ ዓይነት

- የቤት እመቤት
- አርሶ አደር/አርብቶ አደር
- የግል ተቀጣሪ
- የመንግስት ተቀጣሪ
- የግል ንግድ
- ሌላ

109. ስንት ልጅ አለዎት?

_____

110. ቋሚ ወርሃዊ ገቢ አለዎት

- አዎ
- አይ

111. አማካይ የወር ገቢ (በብር)

201. ከዚህ በፊት ስንት ጊዜ ወልደዋል? (የአሁኑን እርግዝና ጨምሮ)

_____

202. ከዚህ ቀደም ያለውን/ያለችውን ልጅዎን የት ነው የወለዱት?

- የጤና ድርጅት
- ቤት
- የልምድ አዋላጅ ቤት
- ወደ ጤና ድርጅት ስመጣ በመንገድ ላይ

203. በጤና ድርጅት ውስጥ ስንት ጊዜ ወልደው ያውቃሉ? (የአሁኑን ወሊድ ሳይጨምር)

_____

204. በአሁኑ እርግዝናዎ የእርግዝና ክትትል አድርገው ነበር?

- አዎን
- አይ

205. ስንት የእርግዝና ክትትል አደረጉ?

- አንድ
- ሁለት
- ሦስትና ከዚያ በላይ
- አላስታውስም

206. በአሁኑ እርግዝናዎ ወቅት ያጋጠመዎት የእርግዝና እክል /ችግር/ ነበር?

- አዎን
- አይ
- አላውቅም

207. በአሁኑ ወሊድ ጊዜ ያጋጠመዎት እክል /ችግር/ ነበር?

- አዎን
- አይ

301. ከሌላ የጤና ተቋም ሪፈር ተጽፎልዎት ነው ወይስ በቀጥታ ነው ወደዚህ ሆስፒታል የመጡት?

- ሪፈር ተጽፎልኝ
- በቀጥታ

302. መቼ እና በስንት ሰዓት ላይ ነበር ወደ ማዋለጃ ክፍል የመጡት?

yyyy-mm-dd _____ hh:mm _____

303. መቼ እና በስንት ሰዓት ላይ ነበር የወለዱት?

yyyy-mm-dd hh:mm

304. በየትኛው አይነት ዋርድ/መተኛ ክፍል/ ውስጥ ነበር የተኙት?

- የግል ዋርድ (አንድ ሰው ብቻ የሚተኛበት)
- የጋራ ዋርድ

305. በዋነኛነት ያዋለደዎት የጤና ባለሞያ ጾታ ምንድን ነው?

- ሴት
- ወንድ

306. በምን አይነት ዘዴ ነበር የወለዱት?

- በምጥ (በማህጸን በር) ብቻ
- በምጥ ተሞክሮ ስላልተሳካ በኦፐራሲዮን
- ምጥ ሳይሞከር በቀጥታ በኦፐራሲዮን

307. ጤና ባለሙያዎች ልጅዎን ከማህጸን በር ለማውጣት የሚያግዝ መሳሪያ ተጠቅመው ወይም እስቲትች አድርገውሎት ነበር?

- አዎን
- አይ

308. ምን አይነት ዘዴ/መሳሪያ/ ነበር የተጠቀሙት?

- ጭንቅላት ላይ የሚደረግ የብረት ኩባያ (Vacuum)
- ጭንቅላት ላይ የሚደረግ መቆንጠጫ (Forceps)
- እስቲትች (Episiotomy)

401. ያዋለዱዎት የጤና ባለሙያ የሚያጸይፍ/ክብረ ነክ የሆነ ንግግር ተናግሮዎት ነበር?

- አዎን
- አይ

402. ያዋለዱዎት የጤና ባለሙያ አርስዎን የሚፈርጅ/ጥፋተኛ ለማድረግ ያለመ ንግግር ተናግረው ነበር?

- አዎን
- አይ

403. በወሊድ ጊዜዎ የጤና ባለሙያ መትቶዎት/ቆንጥጦዎት/ገፍትሮዎት/ሰውነትዎን በጥፊ መትቶዎት ነበር?

- አዎን
- አይ

404. በምጥዎ ጊዜ የጤና ባለሙያዎች ከምጥ ህመም የተነሳ እንዳያቃስቱ/እንዳይጮሁ አስገድዶዎት ነበር?

- አዎን
- አይ

405. በምጥዎ ጊዜ እንዳይንቀሳቀሱ ታስረው/ታግደው ነበር?

- አዎን
- አይ

406. ያዋለዱዎት የጤና ባለሙያ ክትትል/ሕክምና አልሰጥዎትም በማለት ዝተው ነበር?

- አዎን
- አይ

407. ያዋለዱዎት የጤና ባለሙያ በወሊድዎ ጊዜ ለተፈጠረው ሁሉ ነገር ወቅሰዎት ነበር?

- አዎን
- አይ

408. ያዋለዱዎት የጤና ባለሙያ ምርመራ ሲያደርጉ የእርስዎን ፈቃድ ይጠይቁ ነበር?

- አዎን
- አይ

409. ያዋለዱዎት የጤና ባለሙያ የእርስዎን የግል መረጃ በሚስጥር ይይዙ ነበር?

- አዎን
- አይ

410. በዛሬው ወሊድዎ ጊዜ የቀዶ ጥገና ተደርጎልዎት ነበር? (እስቲትች/ኦፕራሲዮን)

- አዎን
- አይ

411. የጤና ባለሙያው እስቲትች/ኦፕራሲዮን ከመስራታቸው በፊት የእርስዎን ፈቃድ ጠይቀው ነበር?

- አዎን
- አይ

412. ያዋለዱዎት የጤና ባለሙያ አርስዎ እገዛ ፈልገው ሲጠሩ ሁልጊዜ ይመጡ ነበር?

- አዎን
- አይ

413. በወሊድ ጊዜዎ ለረጅም ሰዓት ያለጤና ባለሙያ ክትትል ብቻዎን ተትተው ነበር?

- አዎን
- አይ

414. ልጅዎን በወለዱ ሰዓት የጤና ባለሙያ አጠገብዎ ነበር?

- አዎን
- አይ

415. ያዋለዱዎት የጤና ባለሙያ ምክንያቱን ሳይነግሩዎት ልጅዎን ከእርዎ የተለየ ቦታ አድርገው ነበር?

- አዎን
- አይ

416. ያዋለዱዎት የጤና ባለሙያ የማህጸን ምርመራ ሲያደርጉልዎት ፈቃድዎን ይጠይቁ ነበር?

- አዎን
- አይ

417. ያዋለዱዎት የጤና ባለሙያ ሌሎች ሰዎች እንዳያዩ መከለያ ሳያደርጉ የማህጸን ምርመራ አድርጎልዎት ነበር?

- አዎን
- አይ

418. ያዋለዱዎት የጤና ባለሙያ በማይረዱትና በማይገባዎት መልክ ይናገሩ ነበር?

- አዎን
- አይ

419. ያዋለዱዎት የጤና ባለሙያ የምጥዎን ሂደት ይነግሩዎት ነበር?

- አዎን
- አይ

420. በወሊድዎ ጊዜ የራስዎ ሰው/ዘመድ (ድጋፍ ሰጪ) አብሮዎት ማዋለጃ ክፍል እንዲሆን ፈልገው ነበር?

- አዎን
- አይ

421. የጤና ባለሙያዎች የራስዎ ሰው/ዘመድ (ድጋፍ ሰጪ) አብሮዎት ማዋለጃ ክፍል እንዲሆን ፈቅደውሎት ነበር?

- አዎን
- አይ
- መጠየቅ ፈርቼ አልጠየቅኩም

422. በምጥዎ ጊዜ መንቀሳቀስ ፈልገው ነበር?

- አዎን
- አይ

423. የጤና ባለሙያዎች በምጥዎ ጊዜ እንዲንቀሳቀሱ ፈቅደውልዎት ነበር?

- አዎን
- አይ

424. በምጥዎ ጊዜ ፈሳሽ ወይም ደረቅ ምግብ መውሰድ ፈልገው ነበር?

- አዎን
- አይ

425. የጤና ባለሙያዎች በምጥዎ ጊዜ ፈሳሽ ወይም ደረቅ ምግብ እንዲጠቀሙ ፈቅደውልዎት ነበር?

- አዎን
- አይ

426. በወሊድዎ ጊዜ እንዲኖርዎት የፈለጉት አቀማመጥ ወይም አተኛኘት ነበር?

- አዎን
- አይ

427. የጤና ባለሙያዎች በወሊድዎ ጊዜ ለእርዎ በሚመችዎት አቀማመጥ/አተኛኘት እንዲወልዱ ፈቅደውልዎት ነበር?

- አዎን
- አይ
- መጠየቅ ፈርቼ አልጠየቅኩም

428. በወሊድዎ ጊዜ ባህላዊ ሥነሥርዓቶችን (ቡና ማፍላት/ገንፎ ማዘጋጀት/ቅቤ መቀባት/ወዘተ) ፈልገው ነበር?

- አዎን
- አይ

429. በወሊድዎ ጊዜ ባህላዊ ሥነሥርዓቶችን (ቡና ማፍላት/ገንፎ ማዘጋጀት/ቅቤ መቀባት/ወዘተ) እንዲያደርጉ ፈቅደውልዎት ነበር?

- አዎን
- አይ
- መጠየቅ ፈርቼ አልጠየቅኩም

430. ከወሊድዎ በኋላ ያለእርስዎ ፈቃድ በሆስፒታል እንዲቆዩ ተገደው ነበር?

- አዎን
- አይ

431. በወሊድዎ ጊዜ የጤና ባለሙያዎች በዘር/በሃይማኖት/በኢኮኖሚ አቅም/በዕድሜ የተነሳ መገለል አድርሰውቦት ነበር?

- አዎን
- አይ

RMC women's survey

Baxamootta taje gamba assattati, fiqaadensa afi'rate taje gamba assakki albaanni xaphishu hedo eeggatena seekkite xawisse nabbawinsa

Ama hajo beeqqate sumuu yitino?

- ◯ Ee
- ◯ Dee'ni

Taje gamba asannohu su'ma

- ◯ Helen
- ◯ Lemlem
- ◯ Maereg

koode

_____

Hospitaale

- ◯ Adaare
- ◯ Lekku
- ◯ Yirgalamete

101. Mama hee'ratta?

- ◯ Katamu Qawalera
- ◯ Gaxarate Qawalera

102. Me'e wo'ma diro ikkannohe?

_____

103. Umo godowitta woyite me'e diro ikkannohe?

_____

104. Mine assi'rate gari hiittooti?

- ◯ Mine diassiroomma
- ◯ Mine assiroomma
- ◯ Baxxe hee'remma
- ◯ Giwame tidhamoomma
- ◯ Galte'ya reyitno

105. Amma'na

- ◯ Protestaantete kirstianati
- ◯ Ortodokisete kirstianaati
- ◯ Islaamaho
- ◯ Katolikete kirstiyanati
- ◯ Wolehoro kuli_____

106. Daga

- ◯ Sidama
- ◯ Amara
- ◯ Oromo
- ◯ Wolayita
- ◯ Wolehoro kuli_____

107. Rosu deerri

- ◯ Dirosoomma
- ◯ Umi deerra rose, kayinni 8 digudoma
- ◯ 8 gudoomma
- ◯ Layink deerra, kayinni 12 digudoomma
- ◯ 12 gudoomma
- ◯ Layink deer aleenniti

108. Loosikki maati?

- ◯ Mini amaati
- ◯ Baatto loosi're galeemma
- ◯ Gillete qaxaramoomma
- ◯ Mengistete looso loosema
- ◯ Umi'ya daddalo loosema
- ◯ Woleretiro kuli

109. Me''e ooso noohe?

_____

110. Minikkira aganunni egennantino eo noohe?

- ◯ Ee
- ◯ Dinoe

111. Aganunni afi'ratahu me'e ikkanno(birrunni)

201. Xaahunni ledo xaa geeshsha me'e higge ilootta?

_____

202. Sai qaaqqokki mama ilootta?

- Fayyimmate uurrinshira
- Mine
- ilshiishanno amuwi mine
- Fayyimate uurrinsha haranni doogote

203. Fayyimmate mine me'e higge ilootta? (xaa qaaqqo agurranna)

_____

204. Konne/Tenne qaaqqo Godowitta waro fayyimmate mine Godowinni noo amuwira uyinanni owaante/kaa'lo afi'rate ha'rootta

- Ee
- Dee'ni/diha'roomma

205. Owaante afi'rate me'e higge ha'rootta?

- Mitte hige
- Lame hige
- Sase hige woyi hakuyi aleenni
- Diqaagemma

206. Konne/Tenne qaaqqo godowitta waro lowo fayyimmate qarri iille egenninoheni?

- Ee
- Dee'ni
- Diafoomma

207. Konne/Tenne qaaqqo godowitta woyi ilitta woyite lowo qarri ille egenninoheni?

- Ee
- Dee'ni

301. Wole fayyimmate uurrinshanni sonkeennahenso qaxxitahuni dayoota?

- Sonkeennae dayoomma
- Disonkeennae (mininni fulumma gedeenni dayoomma)

302. Tenne hospitaalera goxxe aka'ma mamote hanafootta?

yyyy-mm-dd _____ hh:mm _____

303. Ma yanna ilootta

yyyy-mm-dd hh:mm

304. Goxxe fulitta kifile hiittoote?

- ◯ Callu/mittu manchi kifileeti
- ◯ Woluno goxanno kifileeti

305. Ilitta woyite fayyimmate ogeessi meyaatenso labbaaho?

- ◯ Meyaate
- ◯ Labbaaho

306. Hiittonni ilitta?

- ◯ Qarru nookkiha illanni widoonni
- ◯ Shiimare wo'naalummahu gedensaanni darreenna iloomma
- ◯ Shiimareno wo'naalummakki darreenna iloomma

307. ilate kaa'lora yine wolere loonsiheri nooni?

- ◯ Ee
- ◯ Dee'ni

308. Hiittee ilate kaa'lo loonsonnihe?

- ☐ Qaaqqu umo amadatenni kaa'lannorichchinni
- ☐ Qarawu gedeerichchinni kaa'linoonnie
- ☐ Illanni doogo shiimawa daratenni kaa'linoonnie

401. Fayyimmate ogeeyye kaajjado giwisanno qaale horonsdhuheni?

- ◯ Ee
- ◯ Dee'ni

402. Fayyimmate ogeeyye atere faradate woyi kassasate gedee hedo assitinoni?

- ◯ Ee
- ◯ Dee'ni

403. Ilitta woyite ganihehu, qawaadihehu, kadihehu woyi qi'miidihehu nooni?

- ◯ Ee
- ◯ Dee'ni

404. Ilitta woyite Fugihehunooni?

- ◯ Ee
- ◯ Dee'ni

405. Ilitta woyite biso milli yaattakki gede hoollonniheni?

- Ee
- Dee'ni

406. Fayyimmate ogeeyye kaa'lo ho'litanni waajjishiishshuheni?

- Ee
- Dee'ni

407. Fayyimmate ogeeyye ileemmahu ma ikkannokka yitanni waajjottahura woqassuheni?

- Ee
- Dee'ni

408. Fayyimmate Ogeeyye loossannohe loosira ate fajjo xa'mitinnohe?

- Ee
- Dee'ni

409. Fayyimmate Ogeeyye atewi affanno Misixire maaxxanno?

- Ee
- Dee'ni

410. Darre loonsonniheni (illanni doogo dara, Godowa darreenna ila)

- Ee
- Dee'ni

411. Fayyimmate ogeeyye godowakki darate albaanni ate fajjo xa'mitino?

- Ee
- Dee'ni

412. Fayyimmate Ogeeyye woshshirita woyite rakke dagganno?

- Ee
- Dee'ni

413. Fayyimmate ogeeyye gamete aana hee'dheenna seeda yannara ate callakki agurte hadhinoheni?

- Ee
- Dee'ni

414. Fayyimmate Ogeeyye qaaqqu ilami yannara mule no?

- Ee
- Dee'ni

415.Fayyimmate ogeeyye atera korkaata kultukkinni qaaqqokki atewiinni baddinoni?

- Ee
- Dee'ni

416. Fayyimmate Ogeeyye illanni doogo mirmara assate albaanni ate fajjo xa'mitinohe?

- ◯ Ee
- ◯ Dee'ni

417. Ayee fayyimmate ogeessi illanni doogo mirmara assanno woyite wolu la'annokki gede assikkinni la'annoheni?

- ◯ Ee
- ◯ Dee'ni

418. Fayyimmate ogeessi ati afoottakki qaalinni coo'rinoheni?

- ◯ Ee
- ◯ Dee'ni

419. Fayyimmate ogeessi gamete yannara yanna yannante heedhanno lexxo kulannohe?

- ◯ Ee
- ◯ Dee'ni

420. Ilate gamete goxootta kifilera jaallakki ledokki ikkitara hasi'ratani?

- ◯ Ee
- ◯ Dee'ni

421. Fayyimmate ogeeyye jaallakki ledokki heedhannota fajjitinnohe?

- ◯ Ee
- ◯ Dee'ni
- ◯ xa'ma waaje dixam'ooma

422. Gamete yannara goxootta akawaawera milli yaa hasirottankanni?

- ◯ Ee
- ◯ Dee'ni

423. Fayyimmate ogeeyye milli yaatta gede fajjitinnohe?

- ◯ Ee
- ◯ Dee'ni

424. Gamete yannara itattara woyi agattara hasi'rattani?

- ◯ Ee
- ◯ Dee'ni

425. Fayyimmate ogeeyye itattara woyi agattara fajjitinnohe?

- ◯ Ee
- ◯ Dee'ni

426. Ilatta woyite hedhahera hasirootta ofolla woyi goxa doodhotani?

- Ee
- Dee'ni

427. Fayyimmate ogeessi ati doodhotta bayichcho heedhe ilattara fajjinnohe?

- Ee
- Dee'ni
- xa'ma waaje dixam'ooma

428. Gamete yannara budunni ilanno meentira assinannire atera assinahera hasi'rittani?

- Ee
- Dee'ni

429. Fayyimmate ogeeyye gamete yannara budunni amuwaho assinannire atera assinahera fajjitinnohe?

- Ee
- Dee'ni
- xa'ma waaje dixam'ooma

430. Fayyimmate ogeeyye ati hasi'rittakkinni Hospitaalete keeshshatta gede assitannoheni?

- Ee
- Dee'ni

431. Fayyimmate ogeeyye amma'na, daga, diro, dagoommittete garanna keeranchimma kaima assite wolu mannira assinannihunni baxxino garinni lainohen?

- Ee
- Dee'ni

Reporting checklist for quality improvement study.

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	Reporting Item	Page Number
Title		
#1	Indicate that the manuscript concerns an initiative to improve healthcare (broadly defined to include the quality, safety, effectiveness, patientcenteredness, timeliness, cost, efficiency, and equity of healthcare)	1

Abstract			
	#02a	Provide adequate information to aid in searching and indexing	2
	#02b	Summarize all key information from various sections of the text using the abstract format of the intended publication or a structured summary such as: background, local problem, methods, interventions, results, conclusions	2
Introduction			
Problem description	#3	Nature and significance of the local problem	4
Available knowledge	#4	Summary of what is currently known about the problem, including relevant previous studies	4,5,6
Rationale	#5	Informal or formal frameworks, models, concepts, and / or theories used to explain the problem, any reasons or assumptions that were used to develop the intervention(s), and reasons why the intervention(s) was expected to work	5,6
Specific aims	#6	Purpose of the project and of this report	6
Methods			
Context	#7	Contextual elements considered important at the outset of introducing the intervention(s)	6,7
Intervention(s)	#08a	Description of the intervention(s) in sufficient detail that others could reproduce it	7,8,9

Intervention(s)	#08b	Specifics of the team involved in the work	8,9
Study of the Intervention(s)	#09a	Approach chosen for assessing the impact of the intervention(s)	10,11,12
Study of the Intervention(s)	#09b	Approach used to establish whether the observed outcomes were due to the intervention(s)	12,13
Measures	#10a	Measures chosen for studying processes and outcomes of the intervention(s), including rationale for choosing them, their operational definitions, and their validity and reliability	10,11
Measures	#10b	Description of the approach to the ongoing assessment of contextual elements that contributed to the success, failure, efficiency, and cost	NA
Measures	#10c	Methods employed for assessing completeness and accuracy of data	11,12
Analysis	#11a	Qualitative and quantitative methods used to draw inferences from the data	12,13
Analysis	#11b	Methods for understanding variation within the data, including the effects of time as a variable	12
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	#13a	Initial steps of the intervention(s) and their evolution over time (e.g., time-line diagram, flow chart, or table), including modifications made to the intervention during the project	8; Supp. file 6
	#13b	Details of the process measures and outcome	14,15,16
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BMJ Open

Mitigating the mistreatment of childbearing women: Evaluation of respectful maternity care intervention in Ethiopian hospitals

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2020-038871.R2
Article Type:	Original research
Date Submitted by the Author:	21-Jul-2020
Complete List of Authors:	Asefa, Anteneh; Hawassa University College of Medicine and Health Sciences, School of Public Health ; The University of Melbourne Nossal Institute for Global Health Morgan, Alison; The University of Melbourne Nossal Institute for Global Health Gebremedhin, Samson; Addis Ababa University College of Health Sciences, School of Public Health Lemango , Ephrem; Federal Ministry of Health , Maternal and Child Health Directorate Abebe, Sintayehu; Amref Health Africa in Ethiopia Magge, Hema; Institute for Healthcare Improvement Kermode, Michelle; The University of Melbourne Nossal Institute for Global Health
Primary Subject Heading:	Health services research
Secondary Subject Heading:	Public health
Keywords:	Clinical audit < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Quality in health care < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, PUBLIC HEALTH

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Mitigating the mistreatment of childbearing women: Evaluation of respectful maternity care intervention in Ethiopian hospitals

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Abstract

Objectives: There is a lack of evidence on approaches to mitigating mistreatment during facility-based childbirth. This study compares the experiences of mistreatment reported by childbearing women before and after implementation of a respectful maternity care intervention.

Design: A pre-post study design was undertaken to quantify changes in women's experiences of mistreatment during facility-based childbirth before and after the respectful maternity care intervention.

Intervention: A respectful maternity care intervention was implemented in three hospitals in southern Ethiopia between December 2017 and September 2018 and it included training of service providers, placement of wall posters in labour rooms, and post-training supportive visits for quality improvement.

Outcome measures: A 25-item questionnaire asking women about mistreatment experiences was administered to 388 women (198 in the pre-intervention, 190 in the post-intervention). The outcome variable was the number of mistreatment components experienced by women, expressed as a score out of 25. Multilevel mixed-effects Poisson modelling was used to assess the change in mistreatment score from pre-to post-intervention periods.

Results: The number of mistreatment components experienced by women was reduced by 18% when the post-intervention group was compared with the pre-intervention group (adjusted regression coefficient (Aβ)=0.82, 95%CI: 0.74-0.91). Women who had a complication during pregnancy (Aβ=1.17, 95%CI: 1.01-1.34) and delivery (Aβ=1.16, 95%CI: 1.03-1.32) experienced a greater number of mistreatment components. On the other hand, women who delivered by caesarean delivery after trial of vaginal delivery (Aβ=0.76, 95%CI: 0.63-0.92) and caesarean delivery without trial of vaginal delivery (Aβ=0.68, 95%CI: 0.47-0.98) experienced a lesser number of mistreatment components compared to those who had vaginal delivery.

Conclusions: Women reported significantly fewer mistreatment experiences during childbirth following implementation of the intervention. Given the variety of factors that lead to mistreatment in health facilities, interventions designed to mitigate mistreatment need to involve structural changes.

Keywords: mistreatment, respectful maternity care, intervention, pre-intervention, post-intervention

Strengths and limitations of this study

- This is the first study to test the effectiveness of a respectful maternity care intervention in Ethiopia.
- Comparing the counts of mistreatment components captures the diversity of mistreatment that would not have been possible by simple prevalence measures.
- Treating hospitals as random-effects controls for the impact of other interventions that may have happened around the same time in those facilities.
- Mistreatment components experienced by women were assessed using binary options (yes/no) questions which ignore multiple incidents of a mistreatment component.
- An exit survey of women is prone to recall bias in acquiring data on multiple incidents of mistreatment that would have been minimised by labour observation.

Introduction

Despite the remarkable decline in maternal mortality worldwide, around 800 women die each day due to preventable conditions that emerge in the course of pregnancy and childbirth.[1] According to the World Health Organization's (WHO) estimates, 295,000 maternal deaths occurred in 2017, of which 4.7% occurred in Ethiopia.[1] Low utilization of maternal health care services, especially care during childbirth, is a key challenge to reducing maternal mortality.[2, 3] In 2019, only 47.5% of women delivered in health facilities in Ethiopia.[4]

Women's negative experiences and/or other women's negative experiences of facility-based childbirth are commonly reported reasons for not attending a health facility at the time of delivery.[5-8] These experiences include hostile or insensitive staff[7], disallowance of birth companions[6, 7], disrespectful care[9-11], women's lack of autonomy[8], poor reception at health facilities[6], lack of privacy[6, 7], unfriendly staff[12], abusive care[12], and poor readiness of health facilities.[12] The attitudes, actions and system barriers that contribute to such negative experiences are nowadays labelled as mistreatment or disrespect and abuse. However, an internationally agreed definition of mistreatment or disrespect and abuse still lacks as behaviours that are acceptable to women in some contexts may be unacceptable to women in different contexts.

There is compelling evidence from many countries on the negative impact of mistreatment on the uptake of facility-based childbirth. An evidence synthesis of studies from 16 low and middle-income countries (LMICs) and China revealed that mistreatment during childbirth is a powerful deterrent to facility-based childbirth.[13] Additionally, studies from Afghanistan[14], Bolivia[15], Ghana[16], Kenya[17, 18], Tanzania[19], Malawi[20], and India[21] have clearly reported disrespectful care at birth as a key deterrent to facility-based childbirth.

The body of knowledge on mistreatment is still emerging and evolving, hence methodological approaches to estimate levels of mistreatment differ across settings, thereby making comparison challenging.[22, 23] Prevalence studies conducted in different parts of Ethiopia

between 2013 and 2017 report many examples of mistreatment ranging from non-consented care, non-confidential care, discriminatory care, abandonment of care, non-dignified care, to physical abuse during facility-based childbirth.[24-28]

The 2014 WHO statement, which condemns all forms of mistreatment during facility-based childbirth, identifies five actions to prevent and eliminate mistreatment globally. The statement calls for: evidence synthesis on the effectiveness of interventions that aim to improve respectful maternity care and thereby mitigate mistreatment, defining and measuring mistreatment, and inculcating service providers with the culture of respectful care at the time of birth.[29] Following this, various studies, including a multi-country study led by WHO, have been conducted to review and synthesize methodological frameworks for research on mistreatment.[13, 22, 23, 30-32] However, implementation research to assess the effectiveness of interventions to halt mistreatment have not been reported in Ethiopia.

In the move towards mitigating mistreatment, a focus on respectful maternity care is growing globally, and the 'Universal Rights of Childbearing Women' has been endorsed in several countries.[33] WHO defines respectful maternity care as "the 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".[34]

With the aim of meeting the maternal mortality targets of the Sustainable Development Goals (SDG), strategies for ending preventable maternal mortality were introduced in 2015. The strategy calls for health systems not to neglect respectful maternity care while endeavouring to deliver effective clinical interventions.[35] WHO's framework for quality maternal and newborn health care reinforces the important role of respectful maternity care, and identifies respect and preservation of dignity as one of the eight domains of quality of care.[36] Additionally, in 2018, WHO released guidelines for a positive childbirth experience which recommend respectful maternity care throughout labour and birth for all women.[34] A recent WHO paper published in

The Lancet that found high levels of mistreatment in four countries also highlighted the need for an urgent action to promote the provision of respectful maternity care worldwide.[37]

The government of Ethiopia launched a national movement entitled “the caring, respectful, and compassionate (CRC) health workforce” in 2016. The initiative is one of the four health sector transformation agendas aiming to achieve health targets set for the five years between 2015/16 – 2020/21.[38] However, respectful maternity care initiatives are in early-stage development and currently limited to a few pilot health facilities and technically supported by international partner organizations. Consequently, there is an evidence gap regarding implementation of effective respectful maternity care interventions in the country.

This study was undertaken to assess women’s experiences of mistreatment during facility-based childbirth before and after implementation of an intervention that was designed to improve the quality of care women receive during childbirth in hospitals. Previous respectful maternity care intervention studies from Kenya[39] and Tanzania[40, 41] revealed a significant reduction in the level of mistreatment and an improved attitude of service providers towards women, as a consequence of the interventions. This study is part of a broader interventional mixed methods study that aimed to identify health system challenges to the implementation of RMC and potential solutions to address these challenges. Lessons drawn from the respectful maternity care training and its implementation (Asefa et al. Lessons learned through respectful maternity care training and its implementation in Ethiopia: An interventional mixed methods study) and health system constraints to the promotion of respectful maternity care in Ethiopian hospitals (Asefa et al. Imagining maternity care as a complex adaptive system: understanding health system constraints to the promotion of respectful maternity care) are reported elsewhere. To our knowledge, this study is the first to report on the effectiveness of a respectful maternity care intervention in Ethiopia. The study findings add weight to the emerging evidence base on respectful maternity care, and will be used to inform planning and decision making concerning maternal health and other related services in Ethiopia.

Materials and methods

Study setting

This study was undertaken in three hospitals located in the Southern Nations Nationalities and Peoples Region (SNNPR), Ethiopia. Health services in Ethiopia are organized in three tiers: health posts, health centres, and primary hospitals are in the first tier; the second tier consists of general hospitals; and the third tier, specialized hospitals.[38] In principle, general hospitals are designed to serve a catchment population of 1-1.5 million people whereas primary hospitals are expected to serve 60,000 - 100,000 people. One of the study hospitals, Leku, is a primary hospital reported to be serving a catchment population of 261,271 including an estimated 8000 women who give birth each year. The other two hospitals, Adare and Yirgalem, are general hospitals serving a catchment population of 359,358 and 267,589, respectively. An estimated 10,000 and 9,000 pregnant women give birth each year in the catchments of Adare and Yirgalem hospitals, respectively. The hospitals were selected purposively taking into consideration their geographical proximity and their varying level in the tiers of the Ethiopian health system. The intervention involved only these three hospitals. None of hospitals have a private labour ward or birthing room which means that several women labour in the same room and give birth in one birthing room.

Study design

This study is part of a mixed-methods implementation research study that was conducted to identify health system constraints to the promotion of respectful maternity care and to develop and assess mitigation approaches. A pre-post study that involved no comparison group was undertaken between December 2017 and September 2018 to quantify changes in women's experiences of mistreatment during facility-based childbirth. Women who delivered in the study hospitals were surveyed at the time of discharge; the pre-intervention surveys were conducted in March 2018, whereas the post-intervention surveys were conducted in July and August 2018.

Description of the intervention

The intervention included: training of service providers, placement of wall posters in labour rooms, and post-training supportive visits for quality improvement. Each of these are described below.

The training of service providers involved a three-day workshop using a respectful maternity care training manual developed for this intervention. The manual was drafted by maternal health researchers from Ethiopia and Australia after review of previous respectful maternity care training manuals designed for low-income settings (Kenya[42], Tanzania[43], and Nigeria[44]), international human rights declarations[33, 45, 46], national professional codes of ethics, and national training manuals on maternity care and quality improvement. The manual includes an overview of maternal health in Ethiopia. It covers topics such as human rights and law in the context of reproductive health, respectful maternity care rights and standards, professional ethics, and continuous quality improvement. The draft manual was reviewed by three senior maternal health experts at the Federal Ministry of Health and SNNPR Health Bureau for its content and applicability in the Ethiopian context. Two rounds of three-day respectful maternity care training sessions were conducted at Hawassa University Comprehensive Specialized Teaching Hospital. The training was interactive and deployed various teaching methods including presentations, role plays, demonstrations, case studies, individual readings, video shows, and a hospital visit. Training sessions were facilitated by the principal investigator, a senior maternal health expert from the SNNPR health bureau, and a senior obstetrician-gynaecologist. A total of 64 health service providers participated in the training, 33 in the first round and 31 in the second round (all were staff from the participating hospitals). Fifty-two were midwives, whereas the remaining were integrated emergency surgical officers (4), general practitioners (3), nurses (3), and health officers (2). The SNNPR health bureau and hospital administrations communicated their expectation that all service providers at the participating hospitals who assist women during childbirth should attend the training. In reality, all eligible service providers from Adare (26) and Leku (21) hospitals attended the training sessions. Five

among the 22 eligible service providers from Yirgalem hospital did not attend the training sessions for personal reasons.

Five types of wall posters (four in English and one in Amharic) were distributed to the hospitals following completion of the service provider training. The posters were displayed in labour wards and waiting rooms to serve as job aids for service providers who are trained in English to become health professionals and who generally use service guidelines and reporting formats prepared in English. One of the English version wall posters lists the universal rights of childbearing women prepared by the White Ribbon Alliance.[33] The remaining three are infographics taken from the intrapartum care for a positive childbirth experience guideline prepared by the World Health Organization.[34] The Amharic version poster described the manifestations of mistreatment during facility-based childbirth and the universal rights of childbearing women endorsed by the Federal Ministry of Health, Ethiopia.

Two rounds of post-training quality improvement supportive supervision visits were conducted by the principal investigator and a senior maternal health expert in all hospitals at two-week intervals, in June and July of 2018. During the initial visit, a facility-led assessment of maternity care settings was conducted using a structured checklist that was part of the health providers' training [Supplementary file 1]. The checklist included 32 respectful maternity care standards that were assessed using observation, interview, and review of documents; the standards were grouped into five categories. Action plans were developed by service providers to address actionable gaps identified by the respectful maternity care standards assessment. The gaps that could not be addressed at the labour ward level were passed to hospital administrators for further actions [Supplementary file 1]. During the second visit, similar steps were undertaken to see changes as a result of the initial action plan and promote continuous quality improvement as a routine process. Detailed information on the sequencing of the interventions and the timing of data collection for the broader study, including the current study, is appended [Supplementary file 2].

Participants and procedures

Pregnant women who gave birth in the study hospitals were eligible for inclusion in the study regardless of their mode of delivery (natural or operative) or birth outcome. Once women had completed their discharge requirements and procedures, they were invited to participate in the study and were consecutively enrolled until the required sample size was achieved for each study hospital.

Sample size and sampling

Stata 14 software was used to calculate the sample size for this study using the menu option for determining the difference between two sample means with the assumption of: an anticipated mean count of mistreatment experiences women face in facility-based childbirth (pre-intervention) of 4.91, taken from a study conducted in Addis Ababa[26]; an anticipated mean count of mistreatment experiences women face in facility-based childbirth (post-intervention) of 3.96 (mean difference of 0.95); statistical power of 90%; an allocation ratio of 1:1 between the pre and post-intervention groups; 0.05 level of significance; and 10% non-response rate. Additionally, women receiving care in the same hospital are more likely to receive comparable care during childbirth, so the sample size was adjusted for clustering by assuming a clustering effect of 2. With these assumptions, the minimum required sample size was calculated to be 378 (189 in the pre-intervention group and 189 in the post-intervention group). Eventually, 392 women were invited and 388 women were surveyed (190 in the pre-intervention and 198 in the post-intervention) making the response rate 98.9%; rushing to go home and lack of interest to participate were the reasons for non-participation. Allocation of samples to the three hospitals was made proportionately depending on the number of women who delivered in the hospitals in the last quarter of 2017 for the pre-intervention survey, and the second quarter of 2018 for the post-intervention survey. Accordingly, 172 (87 pre-intervention, 85 post-intervention) women were surveyed from Adare hospital, whereas 86 (46 pre-intervention, 40 post-intervention) and 130 (65 pre-intervention, 65 post-intervention) were from Leku and Yirgalem hospitals,

respectively. Eligible women were enrolled into the study consecutively until the required sample size was met.

Variables and outcome measures

The survey included 25 questions about women's experiences of childbirth in the study hospitals (Table 1). The questions pertained to six categories: verbal abuse; physical abuse; non-consented care; lack of information, privacy and confidentiality; neglect and discrimination; and refusal of preference. The responses consisted of dichotomised mutually exclusive options set as "yes" or "no". The outcome variable was a count variable computed from the 25 variables clustered into the categories mentioned above; the number of mistreatment components women experienced were counted as a score out of 25; maximum possible score being 25 and minimum 0.

The main independent variable of the study was whether the woman belongs to the pre-intervention group or the post-intervention group, i.e. whether she was hospitalised before or after the intervention. The other independent variables, i.e. potential confounders that were considered for adjustment were: sociodemographic (place of residence, age, age at first marriage, marital status, educational status, occupation, religion, ethnicity, monthly income, number of children); obstetric characteristics (complication/s during pregnancy and delivery, type of delivery, intervention/s for vaginal delivery); service utilisation history (antenatal visits, history of facility-based delivery); service-related (referral status, time of admission, hours of stay, gender of service provider)

Questionnaire development

The survey questionnaire was developed as per the recommendations of a comparative analysis of five prevalence studies of mistreatment that were conducted in sub-Saharan Africa countries, including Ethiopia.[22] Additionally, the typology suggested by a mixed-methods systematic review on mistreatment during facility-based childbirth[23] was used to refine and group the 25 questions with some modifications. The questionnaire was originally prepared in

English and later translated into both Amharic and Sidamu Afo languages and back-translated to check for consistency [Supplementary file 3]. Subsequently, an electronic data collection template was prepared using the KoBoToolbox tool, and data collection was made using the KoBoCollect app for android devices.

Data collection

Data were collected by trained nurses and midwives who were fluent speakers of both Amharic and Sidamu Afo languages, recruited from Hawassa University Comprehensive Specialized Hospital. Data collectors received detailed three-day training on the purpose of the study, contents of the questionnaire and effective and ethical survey administration. The questionnaire was pre-tested on 15 women who delivered in Hawassa University Comprehensive Specialized Hospital which resulted in minor modifications to the questionnaire. Before conducting the post-intervention survey, data collectors received a one-day refresher training. To ensure data quality, the supervisor reviewed completed questionnaires for key contents before they were uploaded from the tablets to the server; the principal investigator cross-checked all uploaded questionnaires for consistency and completeness.

Data management and analysis

Data were exported to SPSS V.24 software for cleaning and later to StataSE v.15 software for analysis. The outcome variable, number of mistreatment components women experienced, was confirmed to follow the Poisson distribution by using a one sample independent Kolmogorov-Smirnov test ($p = 0.97$). Additionally, the mean (4.40) and variance (4.14) of the outcome variable were found to be close and thus suitable for Poisson modelling. Three models were constructed in this study: a null (intercept-only) model with the intercept as a fixed effect and random effects for hospitals (model I); a model containing the intervention as a fixed effect and random effects for hospitals (model II); and a model containing the intervention, sociodemographic, obstetric, and health service-related factors as fixed effects and random effects for hospitals (model III). The independent variables were checked for multicollinearity using the variance inflation factor (VIF). Hospital was set as a random-effects variable in all

models to take into account the likely absence of independence among women who received care from the same hospital. Analysis results from model III are reported in this study. A multilevel mixed effects Poisson regression analysis was conducted to identify the association between the independent and outcome variables while adjusting for possible confounders. The fixed effects (association measures) and random effects (variation measures) for the number of mistreatment components experienced are reported. Adjusted exponentiated regression coefficients (β) with their corresponding 95% confidence intervals (CI) were used to estimate the level of association between independent variables and the outcome variable. For comparison purpose, we also ran a fixed effects model with robust standard errors which included hospitals along with other variables of model III as fixed effects.

Patient involvement

Women who gave birth in the study hospitals during the survey periods were involved in the study. These women were not involved in research design, tool development, data analysis, and reporting.

Results

Demographics

Among the 388 women who participated in the study (198 pre-intervention, 190 post-intervention), there was no difference in the distribution of place of residence, age, age at first marriage, educational level, marital status, religion and ethnicity between the two groups (Table 2). Illiteracy and having a regular monthly income were higher in the post-intervention group. More than two thirds (70.1%) of women in the post-intervention group were housewives compared to 51% in the pre-intervention group, $p<.001$ (Table 2).

Obstetric characteristics

More than half of the participants in the pre-intervention (55.6%) and post-intervention (51.6%) groups were multiparous (Table 3). The majority of women delivered their previous child at a

health institution, 75.2% in the pre-intervention and 70.1% in the post-intervention group. Comparable levels of women in both groups had antenatal visits during their index pregnancy; however, having three or more antenatal visits was higher among women in the pre-intervention survey (82.4% vs 71.2%; *p*=.04). Complications during the index pregnancy were reported by 17.2% of women in the pre-intervention group and 10% in the post-intervention group (*p*=.04). Compared to women in the pre-intervention group, women in the post-intervention group were less likely to have had a vaginal delivery (77.4% vs 87.9%, *p*=.01) or an intervened vaginal delivery (39.5% vs 46.4%, *p*=.15) (Table 3).

Service characteristics

There was no difference between the pre- and post-intervention groups with respect to referral status and time of admission (Table 3). On the other hand, a higher proportion (52.5%) of women in the pre-intervention group delivered during the night-time than their counterparts (42.6%), *p*=.05. More than three-fifths (61.1%) of women in the pre-intervention group were assisted mainly by female service providers (51.6% in post-intervention group, *p*=.06) (Table 3).

Preference during childbirth

There were 86 (43.7%) women in the pre-intervention group who wanted to have a birth companion in the labour ward, while the proportion was only 17.9% in the post-intervention group (p<.001). Among those women who wanted to have a birth companion in the pre-intervention group, 14% were afraid to ask service providers to have one (23.5% in the post-intervention group). A higher proportion of women in the pre-intervention group wanted to adopt a preferred birthing position (34.9% vs 19.1%, *p*<.001) and cultural practice in the labour ward (21.7% vs 8.9%, *p*=.001). Additionally, more than half (51.2%) of women who wanted to have cultural practice in the pre-intervention group were afraid to ask service providers to have the practice (47.1% in the post-intervention group). The proportion of women who wanted to move around during birth and who wanted to have food or fluids during birth did not vary significantly between the two groups (Table 3).

Experiences of mistreatment

Almost all women (99.5% pre-intervention vs 99% post-intervention group) reported experiencing at least one type of mistreatment. The number of mistreatment types experienced ranged from one to 12 in the pre-intervention group (median = 5), and one to 11 in the post-intervention group (median = 3.5).

When the pre-intervention and post-intervention groups are compared, a number of improvements are evident. Vaginal examination was performed without permission for 47.9% of the women in post-intervention group; 64.7% in pre-intervention group (p=.001) (Table 1). Additionally, seeking women's consent before procedures, and the practice of allowing birth companions improved post-intervention. On the other hand, some aspects of mistreatment such as the use of harsh or rude language against women, gagging women, and leaving women for a prolonged period of time without attention did not improve significantly following the staff training. Additionally, more than two-thirds (67.9%) of women in the post-intervention group claimed that service providers did not give periodic updates on their labour (52.5% in the pre-intervention survey; p=.002) (Table 1).

We also compared the proportion of women who had encountered mistreatment grouped by six categories (verbal abuse; physical abuse; non-consented care; lack of information, privacy and confidentiality; neglect and discrimination; and refusal of preference). Women who reported having experienced at least one type of mistreatment in a given category were regarded as mistreated in that category. The level of non-consented care measured after the intervention (65.3%) is lower than before the intervention (83.3%), p<.001 (Table 1). Similarly, experiences of physical abuse and refusal of preference showed improvement after the intervention. No significant difference was detected in the level of the remaining three categories of mistreatment (Table 1).

Factors associated with the number of mistreatment components experienced

In the bivariate analysis, the number of mistreatment components experienced was higher among women who had a complication during the index delivery (Cβ = 1.16, 95%CI: 1.05-1.30) and an intervention for vaginal delivery (Cβ = 1.31, 95%CI: 1.20-1.44) (Table 4). Women who gave birth in Yirgalem hospital also experienced a higher number of mistreatment components (Cβ = 1.36, 95%CI: 1.22-1.51) compared to those who gave birth in Adare hospital. In contrast, the number of mistreatment components experienced was lower among women who had two or more deliveries and women who had a caesarean delivery (Table 4).

Multilevel analysis of changes in reported components of mistreatment

Outputs of the intercept-only model (model I) showed that there was significant variation between hospitals in the number of components of mistreatment experienced by women (Table 4). The intraclass correlation coefficient (ICC) of model I also revealed that 12.3% of the variation in the number of components of mistreatment experienced by women is attributable to differences across hospitals. Model II, a model with the main independent variable (intervention group), was different and fit as compared to model I (*p* for likelihood ratio (LR) test < 0.001). Furthermore, model III (a model that includes all the independent variables and the intervention group) was different and fit as compared to model II (*p* for LR test < 0.001). The ICC of model III shows a lower variation (9%) between the hospitals than models I and II. Model III displays the changes in the number of components of mistreatment experienced by participants of the two groups (pre-intervention and post-intervention) after adjusting for potential confounders.

As displayed in Table 4, the number of components of mistreatment experienced by women in the post-intervention group is lower by 18% than those in the pre-intervention group; adjusted regression coefficient (Aβ) = 0.82, 95%CI: 0.74-0.91. The fixed effects model with hospitals as predictors yielded the same effect size with a narrower CI (Aβ = 0.82, 95%CI: 0.76-0.89).

The number of components of mistreatment experienced by women was higher among women with complications during pregnancy (Aβ = 1.17, 95%CI: 1.01-1.34) or delivery (Aβ = 1.16, 95%CI: 1.03-1.32). Women who delivered by caesarean section after trial of vaginal delivery

(Aβ = 0.76, 95%CI: 0.63-0.92) and by caesarean section without trial of vaginal delivery (Aβ = 0.68, 95%CI: 0.47-0.98) experienced fewer number of mistreatment components. The number of mistreatment components experienced by women did not significantly vary by women's demographic, service-related, or other obstetric characteristics not already mentioned above (Table 4).

Discussion

This study was conducted as part of a mixed methods implementation research that aims to identify health system barriers to respectful maternity care and to propose and test mitigation approaches. To our knowledge, this study is the first to report on the effectiveness of a respectful maternity care intervention (facility-level) in Ethiopia. The study found that the number of mistreatment components experienced by women after the respectful maternity care intervention was reduced by 18% compared to the number experienced by women before the intervention. This is a notable improvement given the small-scale intervention we implemented and the known limitations of interventions focused primarily on training health workers.[47] Training of service providers alone cannot be a solution to address mistreatment unless other system elements that significantly influence the behaviour of service providers are also addressed.

Similar implementation studies have been conducted in response to the growing attention to mistreatment and the need to identify recommendations to eliminate mistreatment. The *Heshima* study (Kenya)[39] and the *Staha* study (Tanzania)[41] were conducted to assess the impact of respectful maternity care interventions on the level of mistreatment. The *Heshima* study involved a multi-component respectful maternity care intervention (policy, facility, and community level); 7% reduction in the prevalence of mistreatment was reported following the intervention.[39] The *Staha study* involved community level (client service charter) and facility-level (quality improvement inventory and intervention in maternity wards) interventions, and reported a 66% reduction in the odds of women reporting mistreatment after the intervention.[41] Both *Heshima* and *Staha* studies used a prevalence measure of mistreatment; women who

faced at least one form of mistreatment were labelled as mistreated. Considering women who encountered at least one form of mistreatment as mistreated in these studies may have resulted in the underestimation of the magnitude of change.

In this study, the proportion of women who experienced non-consented care, physical abuse, and refusal of preference was significantly lower in the post-intervention group. No significant difference was observed in the proportion of women who experienced mistreatment in the remaining three categories of mistreatment (verbal abuse; lack of information, privacy and confidentiality; and neglect and discrimination). The very high proportion of women who reported 'non-consented care' suggests that the issue of obtaining consent is not well understood by the staff (and probably by the hospital administration also). Similarly, the very high proportion of women who reported 'lack of information, privacy and confidentiality' and 'refusal of preferences' suggests a poor understanding of these concepts and rights among providers. These are areas that need to be integrated and foregrounded into professional development/quality improvement programs for all levels of staff and the pre-service training of health professionals. Additionally, the high level of mistreatment among women who had complications during delivery, and assisted vaginal delivery might be explained by the fact that several cadres attend women during such events.

According to the *Health Workers for Change* study conducted in four African countries, structural issues such as shortage/lack of manpower and supplies, and poor working conditions inhibit implementation of change interventions.[48] According to the Bowser and Hill framework[49], structural constraints not only impede change initiatives, they also independently contribute to mistreatment. Thus, the categories of mistreatment that were likely to have been a product of these structural issues were not influenced by the intervention because it lacked a structural dimension.

The fact that there is no private labour room combined with the increased presence of birth companions after the intervention may explain the relative lack of improvement in women's

privacy. Adequate preparation and adaptation of labour wards is recommended before operationalizing birth companionship in resource-limited contexts.[34, 50] Lunze and colleagues reviewed 259 (83 sub-Saharan Africa based) studies and reports of innovative approaches for improving maternal and newborn health, using the lens of WHO's health system building blocks. The review revealed that interventions in one health system building block affected other building blocks; the review recommends a system-wide intervention to maximize the effectiveness and sustainability of interventions.[51] Similarly, WHO also recommends that respectful maternity care should be viewed through the lens of systems thinking when prioritizing action areas to improve quality of care.[36]

What makes the *Staha* study similar to our study is that, no changes in the level of verbal abuse and neglect and discrimination were observed after the intervention.[41] This might be explained by the fact that ingrained negative and normalized behaviours require time to change and are highly associated with age and experience of service providers, younger and less experienced providers being less supportive during labour.[52] On the contrary, if a proactive focus on respectful care is provided during pre-service training to younger graduates, who are usually motivated for change, it may nurture respectful behaviour.[53] Additionally, other factors such as uncomfortable working circumstances, overcrowded facilities, space constraints, and poorly motivated staff are not only barriers to the implementation of new guidelines[54] but also contributors to mistreatment.[49] These factors may have contributed to the steady level of the mistreatment components that did not improve in the current study.

Evidence suggests that women's chosen birth companionship contributes to positive birth outcomes for both the mother and the newborn[55] and is recommended by the WHO.[34] In this study, among 120 women who wanted to have a birth companion, only 18(15%) were allowed to have their chosen companion (11.6% in pre-intervention vs 23.5% in post-intervention group). Additionally, 16.7% (14% in pre-intervention vs 23.5% in post-intervention group) of those who would have wanted to have a companion were afraid to ask service providers about this. These unexpressed preferences highlight that facilities and service providers should promote

companionship rather than wait for the request to come from women.[34, 55] And this should be supported by political commitment, high-level advocacy, and operating guidelines.[56] The proportion of women who reported to have their preference during childbirth in the post-intervention survey was lower than that of pre-intervention survey participants; this may be due to the high proportion of women who had a caesarean birth in the post-intervention survey.

In this study, comparing the number (counts) of mistreatment components women experienced helped to identify the changes in the extent or diversity of mistreatment that would not have been possible to identify by simple prevalence measures. Additionally, treating hospitals as random-effects in the statistical model controls for the impact of other interventions that may have happened around the same time in those facilities. The absence of difference in demographic and obstetric characteristics between women of the two groups (pre-intervention and post-intervention) also adds to the soundness of the statistical analysis used to detect changes in mistreatment. Additionally, where women are admitted in a shared ward, comparing the proportion of women mistreated rather than comparing the counts of mistreatment fails to detect changes that might have resulted after an intervention. This is because, there are components of mistreatment that cannot be totally prevented without major structural changes, for example, provision of adequate space to ensure privacy and confidentiality.[40]

One of the limitations of this study is that the mistreatment components experienced by women repeatedly were counted only once as binary response options (yes/no) questions were used. This approach fails to capture multiple incidents of mistreatment components experienced by women, for example, how many times a woman was verbally abused. Additionally, it might have also led to the underestimation of the intervention effect size. To overcome such problems, using questions with frequency response options is recommended. A survey of women at their exit, as in this study, is prone to recall bias in acquiring data on multiple incidents; instead, independent observation in the labour room would be more appropriate.[57] However, observation also has inherent limitations, e.g. the Hawthorne effect—service providers modify their behaviour and become less disrespectful because they know they are being observed.

Pertaining to the generalizability of findings, because the study was conducted only in three hospitals located in the SNNPR, the findings may not be generalizable to other types of hospitals, health centres, and clinics that provide childbirth services in Ethiopia. Additionally, the short washout period and the lack of a control group in this study is a key limitation as it is not possible to attribute with certainty the changes observed to the respectful maternity care intervention.

Finally, we believe that this study being the first to test the effectiveness of a respectful maternity care intervention in Ethiopia, contributes to evidence for further endeavours to improve respectful maternity care specifically, and the quality of childbirth services generally. Thorough implementation studies that are designed to capture macro and micro level contributors to mistreatment need to be conducted to inform evidence-driven actions to eliminate mistreatment during facility-based childbirth in Ethiopia.

Conclusions

This study revealed that the childbirth services women received in the study hospitals were characterized by a wide range of mistreatment behaviours and/or health facility conditions. The respectful maternity care intervention tested in this study was accompanied by a reduction in women's experience of mistreatment during facility-based childbirth. Given the variety of factors that lead to mistreatment in health facilities, interventions designed to mitigate mistreatment need to be multidimensional—including demand-side (community level), supply-side (health system level), and policy-level interventions. We believe that this study adds to existing knowledge on innovations that can be used to mitigate mistreatment. Further research is needed to investigate the impact and sustainability of health system-level interventions on women's experiences of mistreatment during facility-based childbirth.

Acknowledgements

We would like to pass our heartfelt thanks to experts at the Federal Ministry of Health, the SNNPR Health Bureau, and Hawassa University College of Medicine and Health Sciences who

reviewed the respectful maternity care training manual and coordinated the training sessions. We also extend our appreciation to all participants of the study, service providers, and facility administrations for being an active player in the smooth operation of the study. Members of the data collection team also deserve a warm appreciation for their engagement.

Contributors

AA conceived the study; AA, AM and MK designed the study, developed data collection tools; AA trained data collectors, coordinated the fieldwork; AA, SA, HM, ET and SG conducted the intervention; AA, AM and MK analysed the data; AA, AM and MK drafted the manuscript; SA, HM, ET and SG revised the manuscript for intellectual content. All authors have read and approved the manuscript.

Funding

The training of service providers was made possible by support from the Institute of Healthcare Improvement (IHI) through the Federal Ministry of Health, Ethiopia. The primary author of this study is the recipient of the Melbourne Research Scholarship (University of Melbourne), and the Population Health Investing in Research Students' Training (PHIRST) travel grant (Melbourne School of Population and Global Health, University of Melbourne). The contents of this research article only reflect the authors' opinions but do not show interest/s of either of the organizations involved in the funding.

Competing interests

The authors declare that they have no competing interests

Ethics approval

Ethics approval was obtained from the Institutional Review Board (Ethics ID: 3-12/12926) located in SNNPR Health Bureau, Ethiopia and the Human Ethics Sub-Committee (Ethics ID: HESC 1750054) at the University of Melbourne, Australia. Permission letter to conduct this study was also granted from the Federal Ministry of Health and SNNPR Health Bureau. A printout of information about the study (plain language statement) prepared in local languages

was given to literate study participants, and their written consent was recorded on a separate consent form. For illiterate participants, data collectors read contents of both the plain language statement script and the consent form, sought their verbal consent, and signed the consent form on their behalf in the presence of a witness. All forms used were approved by the ethics committees.

Data sharing statement

Reasonable requests can be made to access study data from the corresponding author.

Word count: 5746

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Table 1 Women's experience of mistreatment during childbirth

Types of mistreatment experienced	Pre-intervention n (%)	Post-intervention n (%)	*p*-value for χ^2
Verbal abuse	17 (8.6)	11 (5.8)	0.29
Health workers used harsh or rude language	8 (4.0)	6 (3.2)	0.64
Health workers made judgmental or accusatory comments about woman	8 (4.1)	2 (1.1)	0.06
Health workers made threats of withholding treatment	1 (0.5)	2 (1.1)	0.54
Health workers blamed woman for any features of birth outcome	4 (2.0)	4 (2.1)	0.95
Physical abuse	33 (16.7)	17 (8.9)	0.02*
Woman was beaten, slapped, kicked, or pinched	7 (3.5)	5 (2.6)	0.61
Woman was gagged	19 (9.6)	11 (5.8)	0.16
Woman was restrained	19 (9.6)	9 (4.74)	0.06
Non-consented care	165 (83.3)	124 (65.3)	<0.001*
Health workers did not obtain consent for procedure/s	138 (69.7)	84 (44.2)	<0.001*
Health workers ever separated woman from her baby without explaining	14 (7.1)	7 (3.7)	0.14
Health workers did not ask woman's permission before conducting vaginal examination	128 (64.7)	91 (47.9)	0.001*
Health workers did not ask woman's permission before performing surgery (episiotomy or caesarean section) (n=220)	69 (65.1)	44 (38.6)	<0.001*
Health workers made woman stay in the hospital against her will	4 (2.0)	2 (1.1)	0.44
Lack of information, privacy and confidentiality	189 (95.5)	182 (95.8)	0.88
Health workers did not keep woman's information confidential	18 (9.1)	7 (3.7)	0.03*
Health workers conducted vaginal examination without maintaining woman's privacy	162 (81.8)	147 (77.4)	0.28
Health workers did not give periodic updates on woman's labour	104 (52.5)	129 (67.9)	0.002*
Health workers spoke to woman in a language she could not understand	5 (2.5)	9 (4.7)	0.24
Neglect and discrimination	24 (12.1)	17 (8.9)	0.31
Health workers did not always come following woman's call	8 (4.0)	7 (3.7)	0.86
Woman was ever left for a prolonged period of time without attention	19 (9.6)	12 (6.3)	0.23
Health worker was not present for the actual birth of woman's baby	5 (2.5)	3 (1.6)	0.51
Health workers discriminated woman based on her attribute	-	2 (1.1)	-
Refusal of preference	134 (67.7)	104 (54.7)	0.01*
Health workers did not allow woman to have a birth companion present	64 (86.5)	18 (69.2)	0.04*
Health workers did not allow woman to move around during labour	43 (76.7)	63 (94.3)	0.002*
Health workers did not allow woman to have foods or fluids	66 (94.3)	62 (98.4)	0.21
Health workers did not allow woman to deliver in her preferred position	43 (66.2)	12 (33.3)	0.001*
Health workers did not allow woman to have cultural practice in labour	16 (76.2)	0 (-)	-

Table 2 Women's sociodemographic characteristics

Variables		Pre-intervention n (%)	Post-intervention n (%)	*p*-value for χ^2
Place of residence	Urban	125 (63.1)	119 (62.6)	0.92
	Rural	73 (36.9)	71 (37.4)	
Age in completed year	15-24	98 (49.5)	96 (50.5)	0.93
	25-34	89 (45.0)	85 (44.8)	
	35-44	11 (5.5)	9 (4.7)	
	Median (IQR)	25 (7)	24 (8)	
Age at first pregnancy	Median (IQR)	20 (4)	20 (4)	0.72
Educational level	No formal education	29 (14.7)	38 (20.0)	0.13
	Primary education	81 (40.9)	74 (39.0)	
	Secondary education	48 (24.2)	54 (28.4)	
	College and above	40 (20.2)	24 (12.6)	
Marital status	Single	2 (1.0)	1 (0.5)	0.86
	Married	195 (98.5)	188 (99.0)	
	Separated	1 (0.5)	1 (0.5)	
Religion	Christian Protestant	140 (70.7)	141 (74.2)	
	Christian Orthodox	27 (13.6)	27 (14.2)	0.29
	Christian Catholic	7 (3.5)	2 (1.0)	
	Muslim	17 (8.6)	10 (5.3)	
	Others	7 (3.6)	10 (5.3)	
Ethnicity	Sidama	139 (70.2)	128 (67.4)	0.20
	Oromo	7 (3.5)	15 (7.9)	
	Amhara	13 (6.6)	17 (9.0)	
	Wolayita	17 (8.6)	17 (9.0)	
	Others	22 (11.)	13 (6.8)	
Occupation	Housewife	101 (51.0)	134 (70.5)	< 0.001
	Private employee	8 (4.0)	8 (4.21)	
	Government employee	36 (18.2)	29 (15.3)	
	Private business	41 (20.7)	13 (6.8)	
	Others	12 (6.1)	6 (3.2)	
Respondent has regular	Yes	89 (45.0)	69 (36.3)	0.08
monthly income*	< 1552 Br	34 (38.2)	25 (36.2)	0.8
	≥ 1552 Br	55 (61.8)	44 (63.8)	
	Median (IQR)	2000 (2015)	2000 (1900)	
	No	109 (55.0)	121 (63.7)	

**1USD = 27.23 Br (Average between March and August 2018)*

Table 3 Women's obstetric and maternal healthcare characteristics and preferences during childbirth

Variables		Pre-intervention n (%)	Post-intervention n (%)	*p*-value for χ^2
Total number of deliveries	One	88 (44.4)	92 (48.4)	0.43
	Two or more	110 (55.6)	98 (51.6)	
	Median (IQR)	2 (1)	2 (2)	
Place of delivery of previous child (n=206)	Health facility	82 (75.2)	68 (70.1)	0.41
	Outside health facility	27 (24.8)	29 (29.9)	
Number of previous facility-based deliveries	None	22 (20.2)	22 (22.5)	
	One	69 (63.3)	53 (54.0)	
	Two and more	18 (16.5)	23 (23.5)	
	Median (IQR)	1 (0)	1 (0)	
Antenatal visit during index pregnancy	Yes	188 (94.9)	184 (96.8)	0.35
	One	5 (2.7)	9 (4.9)	0.04
	Two	28 (14.9)	44 (23.9)	
	Three or more	155 (82.4)	131 (71.2)	
	No	10 (5.1)	6 (3.2)	
Experienced complication during index pregnancy	Yes	34 (17.2)	19 (10.0)	0.04
	No	164 (82.8)	171 (90.0)	
Experienced complication during index delivery	Yes	67 (34.0)	70 (36.8)	0.56
	No	130 (66.0)	120 (63.2)	
Referral status on admission	Referred	81 (40.9)	86 (45.3)	0.39
	Non-referred	117 (59.1)	104 (54.4)	
Time of admission*	Day time	106 (53.5)	99 (52.1)	0.78
	Night-time	92 (46.5)	91 (47.9)	
Time of delivery*	Day time	94 (47.5)	109 (57.4)	0.05
	Night-time	104 (52.5)	81 (42.6)	
Type of delivery	Vaginal delivery	174 (87.9)	147 (77.4)	0.01
	Caesarean after trial of vaginal delivery	18 (9.1)	38 (20.0)	
	Caesarean without trial of vaginal delivery	6 (3.0)	5 (2.6)	
Had intervention/s for vaginal delivery (n=377)**	Yes	89 (46.4)	73 (39.5)	0.15
	No	101 (53.6)	111 (60.5)	
Types of assisted vaginal delivery (n=162)[§]	Vacuum extraction	12 (13.5)	9 (12.3)	0.83
	Forceps delivery	8 (9.0)	2 (2.7)	0.10
	Episiotomy	82 (92.1)	71 (97.3)	0.16
Gender of main service provider	Female	121 (61.1)	98 (51.6)	0.06
	Male	77 (38.9)	92 (48.4)	
Woman wanted to have birth companion in the labour ward	Yes	86 (43.7)	34 (17.9)	<0.001
	No	111 (56.5)	156 (82.1)	
Woman wanted to move around during birth	Yes	57 (28.8)	67 (35.5)	0.16
	No	141 (71.1)	122 (64.5)	
Woman wanted to have food or fluids during birth	Yes	70 (35.4)	63 (33.2)	0.65
	No	128 (64.6)	127 (66.8)	

Woman had a preferred birthing position	Yes	69 (34.9)	36 (19.1)	<0.001
	No	129 (65.1)	153 (80.9)	
Woman wanted to have cultural practice in labour	Yes	43 (21.7)	17 (8.9)	0.001
	No	155 (78.3)	173 (91.1)	

**Stayed in hospital for at least two hours between 8pm and 8am immediately before childbirth*

***Includes: Episiotomy, vacuum extractor or forceps*

[§]a woman can have more than one procedure

Table 4 Multilevel mixed-effects regression of counts of mistreatment experienced by women

Variables	Bivariate model Cβ (95% CI)	Model I Aβ (95% CI)	Model II Aβ (95% CI)	Model III Aβ (95% CI)
A) Fixed effects				
(Intercept)		4.32 (3.60, 5.12)	**4.82 (3.98, 5.84)***	7.18 (3.34, 15.44)
Intervention group				
Pre-intervention	Ref.		Ref.	Ref.
Post-intervention	0.79 (0.72, 0.87)		**0.79 (0.72, 0.87)***	**0.82 (0.74, 0.91)***
Place of residence				
Urban	Ref.			Ref.
Rural	1.11 (1.00, 1.22)			1.05 (0.93, 1.19)
Age in completed year				
15-24	Ref.			Ref.
25-34	**0.85 (0.77, 0.94)***			0.95 (0.82, 1.09)
35-44	**0.74 (0.58, 0.94)***			0.81 (0.61, 1.08)
Age at first pregnancy	**1.03 (1.01, 1.04)***			1.01 (0.99, 1.03)
Marital status				
Single	Ref.			Ref.
Married	0.77 (0.48, 1.25)			0.79 (0.45, 1.39)
Separated	1.24 (0.61, 2.51)			1.06 (0.49, 2.31)
Religion				
Christian Protestant	Ref.			Ref.
Christian Orthodox	0.91 (0.78, 1.04)			0.93 (0.76, 1.12)
Christian Catholic	1.01 (0.74, 1.38)			1.01 (0.73, 1.40)
Muslim	1.04 (0.87, 1.25)			1.07 (0.88, 1.31)
Others	**0.70 (0.54, 0.93)***			0.80 (0.60, 1.07)
Ethnicity				
Sidama	Ref.			Ref.
Oromo	0.90 (0.73, 1.12)			0.93 (0.72, 1.19)
Amhara	0.87 (0.72, 1.05)			0.98 (0.77, 1.25)
Wolayita	0.96 (0.81, 1.14)			1.13 (0.92, 1.40)
Others	1.02 (0.86, 1.20)			1.00 (0.81, 1.24)
Educational level				
No formal education	Ref.			Ref.
Primary education	1.11 (0.96, 1.27)			0.99 (0.84, 1.15)
Secondary education	1.05 (0.90, 1.22)			0.98 (0.81, 1.18)
College and above	1.18 (1.00, 1.39)			1.07 (0.84, 1.38)
Occupation				
Housewife	Ref.			Ref.
Private employee	1.06 (0.84, 1.35)			1.06 (0.77, 1.47)
Government employee	1.01 (0.89, 1.16)			0.95 (0.72, 1.25)
Private business	1.00 (0.87, 1.16)			1.01 (0.80, 1.27)
Others	1.14 (0.91, 1.41)			0.90 (0.69, 1.16)
Has regular monthly income*				
No	Ref.			Ref.
Yes	0.95 (0.86, 1.04)			0.92 (0.75, 1.13)
Total number of deliveries				
One	Ref.			Ref.
Two or more	**0.76 (0.69, 0.84)***			0.86 (0.74, 1.02)
Antenatal visit during index pregnancy				
No	Ref.			Ref.
Yes	0.82 (0.66, 1.02)			0.95 (0.74, 1.22)
Experienced complication during index pregnancy				
No	Ref.			Ref.
Yes	**1.35 (1.19, 1.53)***			**1.17 (1.01, 1.34)**
Experienced complication during index delivery				

No	Ref.			Ref.
Yes	**1.16 (1.05, 1.30)***			**1.16 (1.03, 1.32)***
Referral status on admission				
Referred	Ref.			Ref.
Non-referred	0.93 (0.85, 1.02)			1.07 (0.94, 1.21)
Total hours of stay	1.00 (0.99, 1.00)			1.00 (0.99, 1.00)
Gender of main service provider				
Female	Ref.			Ref.
Male	1.05 (0.95, 1.16)			1.03 (0.93 1.16)
Type of delivery				
Vaginal delivery	Ref.			Ref.
Caesarean after trial of vaginal delivery	**0.78 (0.67, 0.90)***			**0.76 (0.63, 0.92)***
Caesarean without trial of vaginal delivery	**0.67 (0.48, 0.95)***			**0.68 (0.47, 0.98)***
Had intervention for vaginal delivery				
No	Ref.			Ref.
Yes	**1.31 (1.20, 1.44)***			1.04 (0.91, 1.19)
B) Random effects				
Hospital				
Variance		0.02 (0.01-0.14)*	0.03 (0.001-0.14)*	-
ICC (%)		12.3	13.6	9.0
C) Model fitness				
AIC		1600	1577	1570
Log Likelihood		-798	-786	-750
P value		-	< 0.001	< 0.001

- *Significant at p<.05*

Abbreviations: ***β*** *exponentiated regression coefficient,* ***Cβ*** ***crude exponentiated regression coefficient,*** ***Aβ*** ***adjusted exponentiated regression coefficient,*** ***CI*** *confidence interval,* ***ICC*** *Intraclass correlation,* ***AIC*** *Akaike's information criterion*

Supplementary file 1

Facility-led respectful maternity care assessment checklist for continuous quality improvement

RMC standards	Measurement criteria O: observation; I: interview; RD: review of documents		NA	Remark
The woman is protected from verbal abuse	[ ]	1. Uses polite language, avoids use of harsh or rude language **(O)**		
	[ ]	2. Does not make judgmental or accusatory comments **(O)**		
	[ ]	3. Does not make threats to withhold treatment **(O)**		
	[ ]	4. Does not blame a woman for any feature of her birth outcome/s **(O)**		
Score	___**of** ___			
The woman is protected from physical abuse	[ ]	1. Does not beat, slap, kick, or pinch a woman **(O)**		
	[ ]	2. Does not deny a woman to cry or scream during labor **(O)**		
	[ ]	3. Does not restrain (tie) a woman **(O)**		
Score	___**of** ___			
The woman is not stigmatized or discriminated	[ ]	1. Serves a woman respectfully regardless of her religion/race/ethnicity/age/socioeconomic status/medical condition **(O/I)**		
	[ ]	2. Serves a woman respectfully regardless of her medical condition **(O/I)**		
Score	___**of** ___			
The woman received professional standard of care	[ ]	1. Seeks for woman's consent prior to performing any procedure **(O)**		
	[ ]	2. Never shouts loudly when communicating woman's information to other staff **(O/I)**		
	[ ]	3. Keeps woman's personal information secure (**O/I/RD)**		
	[ ]	4. Performs vaginal examination very gently to minimize pain **(O/I)**		
	[ ]	5. Maintains woman's privacy while performing vaginal examination **(O/I)**		
	[ ]	6. Gives a woman pain relief when she needs it **(O/I)**		
	[ ]	7. Obtains woman's consent before preparing her for surgery **(O/I)**		
	[ ]	8. Responds to a woman immediately following her call **(O/I)**		
	[ ]	9. Never leaves a woman alone during labour **(O/I)**		
Score	___**of** ___			
	[ ]	1. Introduces himself/herself to a woman when he/she first meet her **(I/O)**		

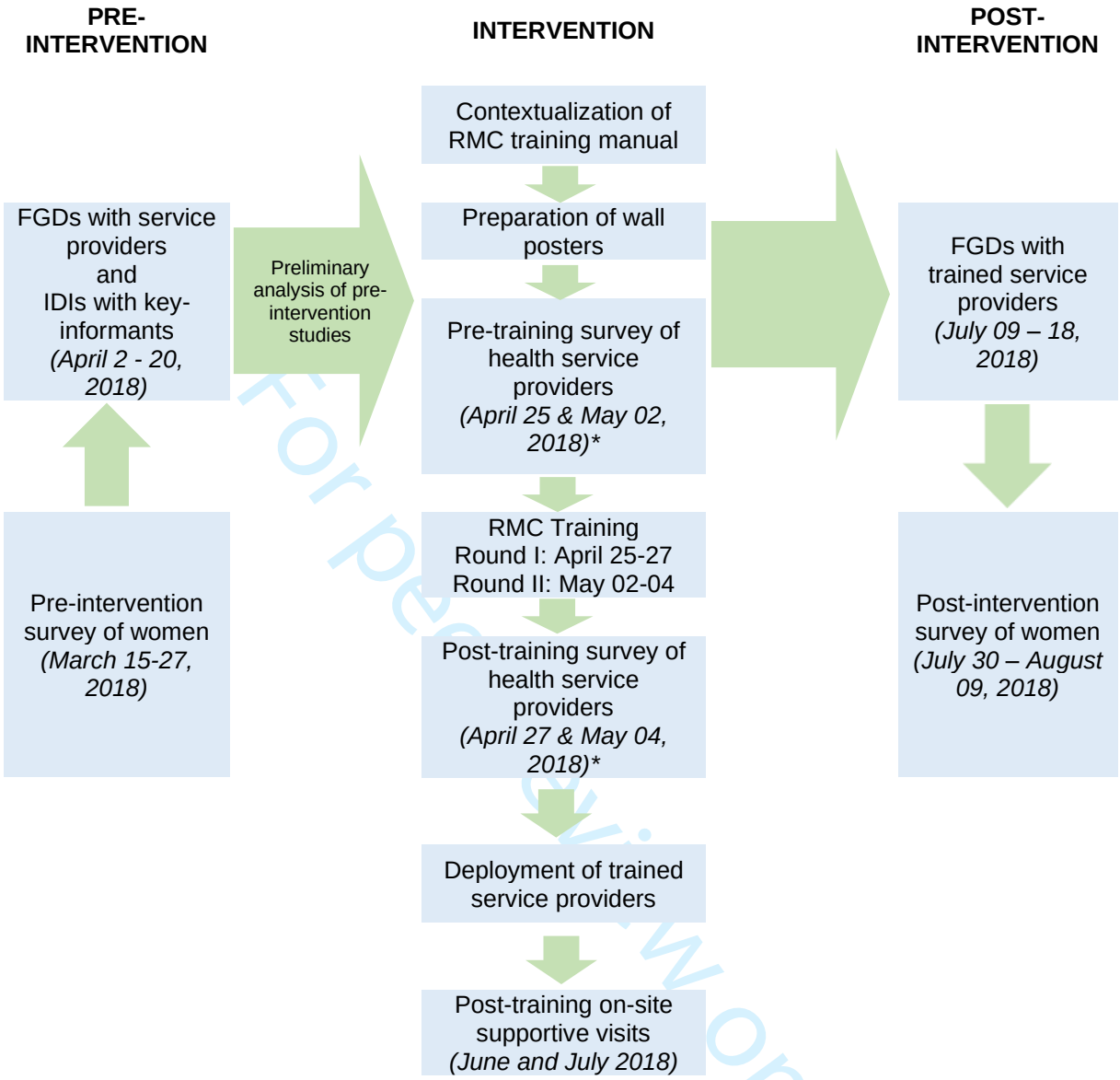
The woman received care with good provider rapport and communication	[ ]	2. Serves a woman in a polite manner **(I/O)**		
	[ ]	3. Does not ignore woman's concern/s while she is in labor **(I/O)**		
	[ ]	4. Speaks to a woman in a clear language **(I/O)**		
	[ ]	5. Gives a woman periodic updates of progress of labor **(O/I)**		
	[ ]	6. Gives credit to every effort a woman makes in labor **(O/I)**		
	[ ]	7. Allows a woman to move around during labor unless there is an indication to deny her **(O/I)**		
	[ ]	8. Allows a woman to take food or fluids if there is no other indication to deny her **(I/O)**		
	[ ]	9. Allows woman's birth companions for companionship **(I/O)**		
	[ ]	10. Allows a woman to assume position of her choice during labor **(I/O)**		
	[ ]	11. Allows a woman any cultural practice she wants to practice in labor **(I/O)**		
	[ ]	12. Does not objectify a woman in labor **(I/O)**		
	[ ]	13. Does not make a woman stay in the hospital without her will **(I/O)**		
	[ ]	14. Keeps a baby with his mom unless there is another indication **(O/I)**		
Score	___**of** ___			
Grand score	___**of** ___			

NA: Not applicable

Action plan matrix to improve respectful maternity care

Indicator (intended target)	Possible cause (key causes)	Action taken (test action)	Responsible person	Support required	Timeline (dd/mm/yy)	Evaluate/ lesson learned (study)	Action for the next cycle
I: T:	C1: C2:						□Modify □Expand □Drop

Supplementary file 2: Order of studies and timing of data collection



RMC-respectful maternity care
**RMC training was conducted in two rounds from 25-27 April 2018 and 02-04 May 2018.*
The post intervention FGDs and the post-intervention survey of women providers were conducted after the intervention has been completed

RMC women's survey

Dear data collector, please read the plain language summary and seek for participants consent before proceeding to the survey

Did the woman agree to participate?

- ◯ Yes
- ◯ No

Name of data collector

- ◯ Helen
- ◯ Lemlem
- ◯ Maereg

Interview code (three digits)

_____

Hospital

- ◯ Adare
- ◯ Leku
- ◯ Yirgalem

101. Place of residence

- ◯ Urban Kebele
- ◯ Rural kebele

102. Age in completed years

_____

103. Age at first pregnancy (in years)

_____

104. Marital status

- ◯ Single
- ◯ Married
- ◯ Separated
- ◯ Divorced
- ◯ Widowed

105. Religion

- ◯ Protestant, christian
- ◯ Orthodox, christian
- ◯ Muslim
- ◯ Christian Catholic
- ◯ Others

106. Ethnicity

- ◯ Sidama
- ◯ Amhara
- ◯ Oromo
- ◯ Wolayita
- ◯ Others

107. Educational status

- ◯ No formal education
- ◯ Some primary - did not complete grade 8
- ◯ Completed grade 8
- ◯ Some secondary - did not complete grade 12
- ◯ Completed grade 12
- ◯ More than secondary

108. Occupation

- ◯ Housewife
- ◯ Farmer
- ◯ Private employee
- ◯ Government employee
- ◯ Private business
- ◯ Others

109. How many children do you have?

_____

110. Do you have regular household monthly income?

- ◯ Yes
- ◯ No

111. Estimated monthly income (in birr)

201. How many times have you delivered before? (including current one)

_____

202. Where did you deliver your last (previous) child?

- Health facility
- Home
- Traditional birth attendant's home
- On my way to health facility

203. How many times have you delivered in health facility? (excluding current one)?

_____

204. Did you have antenatal care visit during your current pregnancy?

- Yes
- No

205. How many antenatal care visits did you have?

- One
- Two
- Three or more
- Don't remember

206. Did you have any complication during your current pregnancy?

- Yes
- No
- I don't know

207. Did you have any complication during your current labor and delivery?

- Yes
- No

301. Were you referred from other facility or directly came here in?

- Referred
- Non-referred

302. What time did you get admitted to the hospital?

yyyy-mm-dd _____ hh:mm _____

303. What time did you deliver?

yyyy-mm-dd hh:mm

304. What type of ward were you admitted in?

- ◯ Private ward
- ◯ Shared ward

305. What was gender of the service provider who mainly assisted you in labor?

- ◯ Female
- ◯ Male

306. What type of birth did you have?

- ◯ Vaginal birth
- ◯ Caesarean birth after labour trial
- ◯ Caesarean birth without labour trial

307. Did you have any procedure for an assisted delivery?

- ◯ Yes
- ◯ No

308. Which procedure did you receive? (Multiple responses possible)

- ☐ Vacuum
- ☐ Forceps
- ☐ Episiotomy

401. Did the health workers use harsh or rude language?

- ◯ Yes
- ◯ No

402. Did the health workers make judgmental or accusatory comments about you?

- ◯ Yes
- ◯ No

403. Were you beaten, slapped, kicked, or pinched during childbirth?

- ◯ Yes
- ◯ No

404. Were you gagged during childbirth?

- ◯ Yes
- ◯ No

405. Were you physically restrained during childbirth?

- ◯ Yes
- ◯ No

406. Did the health workers make threats of withholding treatment?

- ◯ Yes
- ◯ No

407. Did the health workers blame you for any feature of your birth outcomes?

- ◯ Yes
- ◯ No

408. Did the health workers obtain your consent for all procedures?

- ◯ Yes
- ◯ No

409. Did the health workers keep information about you confidential?

- ◯ Yes
- ◯ No

410. Did you have any surgical procedure (episiotomy, cesarean section)?

- ◯ Yes
- ◯ No

411. Did the health worker ask your permission before performing surgery?

- ◯ Yes
- ◯ No

412. Did the health workers always come following your call?

- ◯ Yes
- ◯ No

413. Were you ever left for a prolonged period of time without attention during your labour?

- ◯ Yes
- ◯ No

414. Was a health provider present for the actual birth of your baby?

- ◯ Yes
- ◯ No

415. Did the health workers ever separate you from your baby without explaining the reason?

- ◯ Yes
- ◯ No

416. Did the health workers ask your permission before conducting a vaginal examination?

- ◯ Yes
- ◯ No

417. Did any health worker conduct vaginal examination without maintaining your privacy?

- ◯ Yes
- ◯ No

418. Did the health workers speak to you in a language you do not understand?

- ◯ Yes
- ◯ No

419. Did the health workers give you periodic updates on your labor?

- ◯ Yes
- ◯ No

420. Did you want to have a birth companion in the labor ward?

- ◯ Yes
- ◯ No

421. Did the health workers allow you to have your birth companion present?

- ◯ Yes
- ◯ No
- ◯ I was afraid to ask

422. Did you want to move around during your labor?

- ◯ Yes
- ◯ No

423. Did the health workers allow you to move around during your labor?

- ◯ Yes
- ◯ No

424. Did you want to have food or fluids during your labor?

- ◯ Yes
- ◯ No

425. Did the health workers allow you to have food or fluids?

- ◯ Yes
- ◯ No

426. Did you have a preferred birthing position?

- ◯ Yes
- ◯ No

427. Did the health workers allow you to deliver in your preferred position?

- ◯ Yes
- ◯ No
- ◯ I was afraid to ask

428. Did you want to have a cultural practice in labor?

- ◯ Yes
- ◯ No

429. Did the health workers allow you this cultural practice in labor?

- ◯ Yes
- ◯ No
- ◯ I was afraid to ask

430. Did the health workers make you stay in the hospital against your will?

- ◯ Yes
- ◯ No

431. Did the health workers discriminate you based on your religion /ethnicity/age/socioeconomic status/medical condition?

- ◯ Yes
- ◯ No

RMC women's survey

ከመጀመርሽ በፊት የጥናቱን ዓላማ እዚህ ላይ በተጻፈው በማስረዳት የተሳታፊዋን ፈቃድ ጠይቂ

የጥናቱ ተጋባዥ ለመሳተፍ ፈቃደኛ ናት?

- አዎ
- አይ

የመረጃ ሰብሳቢ ስም

- ሔለን
- ለምለም
- ማዕረግ

የቃለ መጠይቅ ኮድ

_____

የሆስፒታል ስም

- አዳሬ
- ለኩ
- ይርጋዓለም

101. የመኖሪያ አድራሻ

- የከተማ ቀበሌ
- የገጠር ቀበሌ

102. ዕድሜ

_____

103. ለመጀመሪያ ጊዜ ያረገዙት በስንት እድሜዎት ነው?

_____

104. የጋብቻ ሁኔታ

- ያላገባች
- ያገባች
- የተለያየች
- የተፋታች
- ባሏ የሞተባት

105. ሃይማኖት

- ፕሮቴስታንት
- አርቶዶክስ
- ሙስሊም
- ካቶሊክ
- ሌላ

106. ብሔር

- ሲዳማ
- አማራ
- ኦሮሞ
- ወላይታ
- ሌላ

107. የትምህርት ደረጃ

- ያልተማረች
- አንደኛ ደረጃ (1-8)
- ስምንተኛ ክፍል ያጠናቀቀች
- ሁለተኛ ደረጃ (9-12)
- አሥራ ሁለተኛ ክፍል ያጠናቀቀች
- ከአሥራ ሁለተኛ ክፍል በላይ

108. የሥራ ዓይነት

- የቤት እመቤት
- አርሶ አደር/አርብቶ አደር
- የግል ተቀጣሪ
- የመንግስት ተቀጣሪ
- የግል ንግድ
- ሌላ

109. ስንት ልጅ አለዎት?

_____

110. ቋሚ ወርሃዊ ገቢ አለዎት

- አዎ
- አይ

111. አማካይ የወር ገቢ (በብር)

201. ከዚህ በፊት ስንት ጊዜ ወልደዋል? (የአሁኑን እርግዝና ጨምሮ)

_____

202. ከዚህ ቀደም ያለውን/ያለችውን ልጅዎን የት ነው የወለዱት?

- የጤና ድርጅት
- ቤት
- የልምድ አዋላጅ ቤት
- ወደ ጤና ድርጅት ስመጣ በመንገድ ላይ

203. በጤና ድርጅት ውስጥ ስንት ጊዜ ወልደው ያውቃሉ? (የአሁኑን ወሊድ ሳይጨምር)

_____

204. በአሁኑ እርግዝናዎ የእርግዝና ክትትል አድርገው ነበር?

- አዎን
- አይ

205. ስንት የእርግዝና ክትትል አደረጉ?

- አንድ
- ሁለት
- ሦስትና ከዚያ በላይ
- አላስታውስም

206. በአሁኑ እርግዝናዎ ወቅት ያጋጠመዎት የእርግዝና እክል /ችግር/ ነበር?

- አዎን
- አይ
- አላውቅም

207. በአሁኑ ወሊድ ጊዜ ያጋጠመዎት እክል /ችግር/ ነበር?

- አዎን
- አይ

301. ከሌላ የጤና ተቋም ሪፈር ተጽፎልዎት ነው ወይስ በቀጥታ ነው ወደዚህ ሆስፒታል የመጡት?

- ሪፈር ተጽፎልኝ
- በቀጥታ

302. መቼ እና በስንት ሰዓት ላይ ነበር ወደ ማዋለጃ ክፍል የመጡት?

yyyy-mm-dd _____ hh:mm _____

303. መቼ እና በስንት ሰዓት ላይ ነበር የወለዱት?

yyyy-mm-dd hh:mm

304. በየትኛው አይነት ዋርድ/መተኛ ክፍል/ ውስጥ ነበር የተኙት?

- የግል ዋርድ (አንድ ሰው ብቻ የሚተኛበት)
- የጋራ ዋርድ

305. በዋነኛነት ያዋለደዎት የጤና ባለሞያ ጾታ ምንድን ነው?

- ሴት
- ወንድ

306. በምን አይነት ዘዴ ነበር የወለዱት?

- በምጥ (በማህጸን በር) ብቻ
- በምጥ ተሞክሮ ስላልተሳካ በኦፐራሲዮን
- ምጥ ሳይሞከር በቀጥታ በኦፐራሲዮን

307. ጤና ባለሙያዎች ልጅዎን ከማህጸን በር ለማውጣት የሚያግዝ መሳሪያ ተጠቅመው ወይም እስቲትች አድርገውሎት ነበር?

- አዎን
- አይ

308. ምን አይነት ዘዴ/መሳሪያ/ ነበር የተጠቀሙት?

- ጭንቅላት ላይ የሚደረግ የብረት ኩባያ (Vacuum)
- ጭንቅላት ላይ የሚደረግ መቆንጠጫ (Forceps)
- እስቲትች (Episiotomy)

401. ያዋለዱዎት የጤና ባለሙያ የሚያጸይፍ/ክብረ ነክ የሆነ ንግግር ተናግሮዎት ነበር?

- አዎን
- አይ

402. ያዋለዱዎት የጤና ባለሙያ አርስዎን የሚፈርጅ/ጥፋተኛ ለማድረግ ያለመ ንግግር ተናግረው ነበር?

- አዎን
- አይ

403. በወሊድ ጊዜዎ የጤና ባለሙያ መትቶዎት/ቆንጥጦዎት/ገፍትሮዎት/ሰውነትዎን በጥፊ መትቶዎት ነበር?

- አዎን
- አይ

404. በምጥዎ ጊዜ የጤና ባለሙያዎች ከምጥ ህመም የተነሳ እንዳያቃስቱ/እንዳይጮሁ አስገድዶዎት ነበር?

- አዎን
- አይ

405. በምጥዎ ጊዜ እንዳይንቀሳቀሱ ታስረው/ታግደው ነበር?

- አዎን
- አይ

406. ያዋለዱዎት የጤና ባለሙያ ክትትል/ሕክምና አልሰጥዎትም በማለት ዝተው ነበር?

- አዎን
- አይ

407. ያዋለዱዎት የጤና ባለሙያ በወሊድዎ ጊዜ ለተፈጠረው ሁሉ ነገር ወቅሰዎት ነበር?

- አዎን
- አይ

408. ያዋለዱዎት የጤና ባለሙያ ምርመራ ሲያደርጉ የእርስዎን ፈቃድ ይጠይቁ ነበር?

- አዎን
- አይ

409. ያዋለዱዎት የጤና ባለሙያ የእርስዎን የግል መረጃ በሚስጥር ይይዙ ነበር?

- አዎን
- አይ

410. በዛሬው ወሊድዎ ጊዜ የቀዶ ጥገና ተደርጎልዎት ነበር? (እስቲትች/ኦፕራሲዮን)

- አዎን
- አይ

411. የጤና ባለሙያው እስቲትች/ኦፕራሲዮን ከመስራታቸው በፊት የእርስዎን ፈቃድ ጠይቀው ነበር?

- አዎን
- አይ

412. ያዋለዱዎት የጤና ባለሙያ አርስዎ እገዛ ፈልገው ሲጠሩ ሁልጊዜ ይመጡ ነበር?

- አዎን
- አይ

413. በወሊድ ጊዜዎ ለረጅም ሰዓት ያለጤና ባለሙያ ክትትል ብቻዎን ተትተው ነበር?

- አዎን
- አይ

414. ልጅዎን በወለዱ ሰዓት የጤና ባለሙያ አጠገብዎ ነበር?

- አዎን
- አይ

415. ያዋለዱዎት የጤና ባለሙያ ምክንያቱን ሳይነግሩዎት ልጅዎን ከእርዎ የተለየ ቦታ አድርገው ነበር?

- አዎን
- አይ

416. ያዋለዱዎት የጤና ባለሙያ የማህጸን ምርመራ ሲያደርጉልዎት ፈቃድዎን ይጠይቁ ነበር?

- አዎን
- አይ

417. ያዋለዱዎት የጤና ባለሙያ ሌሎች ሰዎች እንዳያዩ መከለያ ሳያደርጉ የማህጸን ምርመራ አድርጎልዎት ነበር?

- አዎን
- አይ

418. ያዋለዱዎት የጤና ባለሙያ በማይረዱትና በማይገባዎት መልክ ይናገሩ ነበር?

- አዎን
- አይ

419. ያዋለዱዎት የጤና ባለሙያ የምጥዎን ሂደት ይነግሩዎት ነበር?

- አዎን
- አይ

420. በወሊድዎ ጊዜ የራስዎ ሰው/ዘመድ (ድጋፍ ሰጪ) አብሮዎት ማዋለጃ ክፍል እንዲሆን ፈልገው ነበር?

- አዎን
- አይ

421. የጤና ባለሙያዎች የራስዎ ሰው/ዘመድ (ድጋፍ ሰጪ) አብሮዎት ማዋለጃ ክፍል እንዲሆን ፈቅደውሎት ነበር?

- አዎን
- አይ
- መጠየቅ ፈርቼ አልጠየቅኩም

422. በምጥዎ ጊዜ መንቀሳቀስ ፈልገው ነበር?

- አዎን
- አይ

423. የጤና ባለሙያዎች በምጥዎ ጊዜ እንዲንቀሳቀሱ ፈቅደውልዎት ነበር?

- አዎን
- አይ

424. በምጥዎ ጊዜ ፈሳሽ ወይም ደረቅ ምግብ መውሰድ ፈልገው ነበር?

- አዎን
- አይ

425. የጤና ባለሙያዎች በምጥዎ ጊዜ ፈሳሽ ወይም ደረቅ ምግብ እንዲጠቀሙ ፈቅደውልዎት ነበር?

- አዎን
- አይ

426. በወሊድዎ ጊዜ እንዲኖርዎት የፈለጉት አቀማመጥ ወይም አተኛኘት ነበር?

- አዎን
- አይ

427. የጤና ባለሙያዎች በወሊድዎ ጊዜ ለእርዎ በሚመችዎት አቀማመጥ/አተኛኘት እንዲወልዱ ፈቅደውልዎት ነበር?

- አዎን
- አይ
- መጠየቅ ፈርቼ አልጠየቅኩም

428. በወሊድዎ ጊዜ ባህላዊ ሥነሥርዓቶችን (ቡና ማፍላት/ገንፎ ማዘጋጀት/ቅቤ መቀባት/ወዘተ) ፈልገው ነበር?

- አዎን
- አይ

429. በወሊድዎ ጊዜ ባህላዊ ሥነሥርዓቶችን (ቡና ማፍላት/ገንፎ ማዘጋጀት/ቅቤ መቀባት/ወዘተ) እንዲያደርጉ ፈቅደውልዎት ነበር?

- አዎን
- አይ
- መጠየቅ ፈርቼ አልጠየቅኩም

430. ከወሊድዎ በኋላ ያለእርስዎ ፈቃድ በሆስፒታል እንዲቆዩ ተገደው ነበር?

- አዎን
- አይ

431. በወሊድዎ ጊዜ የጤና ባለሙያዎች በዘር/በሃይማኖት/በኢኮኖሚ አቅም/በዕድሜ የተነሳ መገለል አድርሰውቦት ነበር?

- አዎን
- አይ

RMC women's survey

Baxamootta taje gamba assattati, fiqaadensa afi'rate taje gamba assakki albaanni xaphishu hedo eeggatena seekkite xawisse nabbawinsa

Ama hajo beeqqate sumuu yitino?

- ◯ Ee
- ◯ Dee'ni

Taje gamba asannohu su'ma

- ◯ Helen
- ◯ Lemlem
- ◯ Maereg

koode

_____

Hospitaale

- ◯ Adaare
- ◯ Lekku
- ◯ Yirgalamete

101. Mama hee'ratta?

- ◯ Katamu Qawalera
- ◯ Gaxarate Qawalera

102. Me'e wo'ma diro ikkannohe?

_____

103. Umo godowitta woyite me'e diro ikkannohe?

_____

104. Mine assi'rate gari hiittooti?

- ◯ Mine diassiroomma
- ◯ Mine assiroomma
- ◯ Baxxe hee'remma
- ◯ Giwame tidhamoomma
- ◯ Galte'ya reyitno

105. Amma'na

- ◯ Protestaantete kirstianati
- ◯ Ortodokisete kirstianaati
- ◯ Islaamaho
- ◯ Katolikete kirstiyanati
- ◯ Wolehoro kuli_____

106. Daga

- ◯ Sidama
- ◯ Amara
- ◯ Oromo
- ◯ Wolayita
- ◯ Wolehoro kuli_____

107. Rosu deerri

- ◯ Dirosoomma
- ◯ Umi deerra rose, kayinni 8 digudoma
- ◯ 8 gudoomma
- ◯ Layink deerra, kayinni 12 digudoomma
- ◯ 12 gudoomma
- ◯ Layink deer aleenniti

108. Loosikki maati?

- ◯ Mini amaati
- ◯ Baatto loosi're galeemma
- ◯ Gillete qaxaramoomma
- ◯ Mengistete looso loosema
- ◯ Umi'ya daddalo loosema
- ◯ Woleretiro kuli

109. Me''e ooso noohe?

_____

110. Minikkira aganunni egennantino eo noohe?

- ◯ Ee
- ◯ Dinoe

111. Aganunni afi'ratahu me'e ikkanno(birrunni)

201. Xaahunni ledo xaa geeshsha me'e higge ilootta?

_____

202. Sai qaaqqokki mama ilootta?

- Fayyimmate uurrinshira
- Mine
- ilshiishanno amuwi mine
- Fayyimate uurrinsha haranni doogote

203. Fayyimmate mine me'e higge ilootta? (xaa qaaqqo agurranna)

_____

204. Konne/Tenne qaaqqo Godowitta waro fayyimmate mine Godowinni noo amuwira uyinanni owaante/kaa'lo afi'rate ha'rootta

- Ee
- Dee'ni/diha'roomma

205. Owaante afi'rate me'e higge ha'rootta?

- Mitte hige
- Lame hige
- Sase hige woyi hakuyi aleenni
- Diqaagemma

206. Konne/Tenne qaaqqo godowitta waro lowo fayyimmate qarri iille egenninoheni?

- Ee
- Dee'ni
- Diafoomma

207. Konne/Tenne qaaqqo godowitta woyi ilitta woyite lowo qarri ille egenninoheni?

- Ee
- Dee'ni

301. Wole fayyimmate uurrinshanni sonkeennahenso qaxxitahuni dayoota?

- Sonkeennae dayoomma
- Disonkeennae (mininni fulumma gedeenni dayoomma)

302. Tenne hospitaalera goxxe aka'ma mamote hanafootta?

yyyy-mm-dd _____ hh:mm _____

303. Ma yanna ilootta

yyyy-mm-dd hh:mm

304. Goxxe fulitta kifile hiittoote?

- ◯ Callu/mittu manchi kifileeti
- ◯ Woluno goxanno kifileeti

305. Ilitta woyite fayyimmate ogeessi meyaatenso labbaaho?

- ◯ Meyaate
- ◯ Labbaaho

306. Hiittonni ilitta?

- ◯ Qarru nookkiha illanni widoonni
- ◯ Shiimare wo'naalummahu gedensaanni darreenna iloomma
- ◯ Shiimareno wo'naalummakki darreenna iloomma

307. ilate kaa'lora yine wolere loonsiheri nooni?

- ◯ Ee
- ◯ Dee'ni

308. Hiittee ilate kaa'lo loonsonnihe?

- ☐ Qaaqqu umo amadatenni kaa'lannorichchinni
- ☐ Qarawu gedeerichchinni kaa'linoonnie
- ☐ Illanni doogo shiimawa daratenni kaa'linoonnie

401. Fayyimmate ogeeyye kaajjado giwisanno qaale horonsdhuheni?

- ◯ Ee
- ◯ Dee'ni

402. Fayyimmate ogeeyye atere faradate woyi kassasate gedee hedo assitinoni?

- ◯ Ee
- ◯ Dee'ni

403. Ilitta woyite ganihehu, qawaadihehu, kadihehu woyi qi'miidihehu nooni?

- ◯ Ee
- ◯ Dee'ni

404. Ilitta woyite Fugihehunooni?

- ◯ Ee
- ◯ Dee'ni

405. Ilitta woyite biso milli yaattakki gede hoollonniheni?

- Ee
- Dee'ni

406. Fayyimmate ogeeyye kaa'lo ho'litanni waajjishiishshuheni?

- Ee
- Dee'ni

407. Fayyimmate ogeeyye ileemmahu ma ikkannokka yitanni waajjottahura woqassuheni?

- Ee
- Dee'ni

408. Fayyimmate Ogeeyye loossannohe loosira ate fajjo xa'mitinnohe?

- Ee
- Dee'ni

409. Fayyimmate Ogeeyye atewi affanno Misixire maaxxanno?

- Ee
- Dee'ni

410. Darre loonsonniheni (illanni doogo dara, Godowa darreenna ila)

- Ee
- Dee'ni

411. Fayyimmate ogeeyye godowakki darate albaanni ate fajjo xa'mitino?

- Ee
- Dee'ni

412. Fayyimmate Ogeeyye woshshirita woyite rakke dagganno?

- Ee
- Dee'ni

413. Fayyimmate ogeeyye gamete aana hee'dheenna seeda yannara ate callakki agurte hadhinoheni?

- Ee
- Dee'ni

414. Fayyimmate Ogeeyye qaaqqu ilami yannara mule no?

- Ee
- Dee'ni

415.Fayyimmate ogeeyye atera korkaata kultukkinni qaaqqokki atewiinni baddinoni?

- Ee
- Dee'ni

416. Fayyimmate Ogeeyye illanni doogo mirmara assate albaanni ate fajjo xa'mitinohe?

- ◯ Ee
- ◯ Dee'ni

417. Ayee fayyimmate ogeessi illanni doogo mirmara assanno woyite wolu la'annokki gede assikkinni la'annoheni?

- ◯ Ee
- ◯ Dee'ni

418. Fayyimmate ogeessi ati afoottakki qaalinni coo'rinoheni?

- ◯ Ee
- ◯ Dee'ni

419. Fayyimmate ogeessi gamete yannara yanna yannante heedhanno lexxo kulannohe?

- ◯ Ee
- ◯ Dee'ni

420. Ilate gamete goxootta kifilera jaallakki ledokki ikkitara hasi'ratani?

- ◯ Ee
- ◯ Dee'ni

421. Fayyimmate ogeeyye jaallakki ledokki heedhannota fajjitinnohe?

- ◯ Ee
- ◯ Dee'ni
- ◯ xa'ma waaje dixam'ooma

422. Gamete yannara goxootta akawaawera milli yaa hasirottankanni?

- ◯ Ee
- ◯ Dee'ni

423. Fayyimmate ogeeyye milli yaatta gede fajjitinnohe?

- ◯ Ee
- ◯ Dee'ni

424. Gamete yannara itattara woyi agattara hasi'rattani?

- ◯ Ee
- ◯ Dee'ni

425. Fayyimmate ogeeyye itattara woyi agattara fajjitinnohe?

- ◯ Ee
- ◯ Dee'ni

426. Ilatta woyite hedhahera hasirootta ofolla woyi goxa doodhotani?

- Ee
- Dee'ni

427. Fayyimmate ogeessi ati doodhotta bayichcho heedhe ilattara fajjinnohe?

- Ee
- Dee'ni
- xa'ma waaje dixam'ooma

428. Gamete yannara budunni ilanno meentira assinannire atera assinahera hasi'rittani?

- Ee
- Dee'ni

429. Fayyimmate ogeeyye gamete yannara budunni amuwaho assinannire atera assinahera fajjitinnohe?

- Ee
- Dee'ni
- xa'ma waaje dixam'ooma

430. Fayyimmate ogeeyye ati hasi'rittakkinni Hospitaalete keeshshatta gede assitannoheni?

- Ee
- Dee'ni

431. Fayyimmate ogeeyye amma'na, daga, diro, dagoommittete garanna keeranchimma kaima assite wolu mannira assinannihunni baxxino garinni lainohen?

- Ee
- Dee'ni

Reporting checklist for quality improvement study.

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	Reporting Item	Page Number
Title		
#1	Indicate that the manuscript concerns an initiative to improve healthcare (broadly defined to include the quality, safety, effectiveness, patientcenteredness, timeliness, cost, efficiency, and equity of healthcare)	1

Abstract			
	#02a	Provide adequate information to aid in searching and indexing	2
	#02b	Summarize all key information from various sections of the text using the abstract format of the intended publication or a structured summary such as: background, local problem, methods, interventions, results, conclusions	2
Introduction			
Problem description	#3	Nature and significance of the local problem	4
Available knowledge	#4	Summary of what is currently known about the problem, including relevant previous studies	4,5,6
Rationale	#5	Informal or formal frameworks, models, concepts, and / or theories used to explain the problem, any reasons or assumptions that were used to develop the intervention(s), and reasons why the intervention(s) was expected to work	5,6
Specific aims	#6	Purpose of the project and of this report	6
Methods			
Context	#7	Contextual elements considered important at the outset of introducing the intervention(s)	6,7
Intervention(s)	#08a	Description of the intervention(s) in sufficient detail that others could reproduce it	7,8,9

Intervention(s)	#08b	Specifics of the team involved in the work	8,9
Study of the Intervention(s)	#09a	Approach chosen for assessing the impact of the intervention(s)	10,11,12
Study of the Intervention(s)	#09b	Approach used to establish whether the observed outcomes were due to the intervention(s)	12,13
Measures	#10a	Measures chosen for studying processes and outcomes of the intervention(s), including rationale for choosing them, their operational definitions, and their validity and reliability	10,11
Measures	#10b	Description of the approach to the ongoing assessment of contextual elements that contributed to the success, failure, efficiency, and cost	NA
Measures	#10c	Methods employed for assessing completeness and accuracy of data	11,12
Analysis	#11a	Qualitative and quantitative methods used to draw inferences from the data	12,13
Analysis	#11b	Methods for understanding variation within the data, including the effects of time as a variable	12
Ethical considerations	#12	Ethical aspects of implementing and studying the intervention(s) and how they were addressed, including, but not limited to, formal ethics review and potential conflict(s) of interest	22

Results

	#13a	Initial steps of the intervention(s) and their evolution over time (e.g., time-line diagram, flow chart, or table), including modifications made to the intervention during the project	8; Supp. file 6
	#13b	Details of the process measures and outcome	14,15,16
	#13c	Contextual elements that interacted with the intervention(s)	15,16
	#13d	Observed associations between outcomes, interventions, and relevant contextual elements	15,16
	#13e	Unintended consequences such as unexpected benefits, problems, failures, or costs associated with the intervention(s).	NA
	#13f	Details about missing data	NA
Discussion			
Summary	#14a	Key findings, including relevance to the rationale and specific aims	17
Summary	#14b	Particular strengths of the project	17,20
Interpretation	#15a	Nature of the association between the intervention(s) and the outcomes	17,18
Interpretation	#15b	Comparison of results with findings from other publications	17-20
Interpretation	#15c	Impact of the project on people and systems	18-20
Interpretation	#15d	Reasons for any differences between observed and anticipated outcomes, including the influence of context	18,19

Interpretation	#15e	Costs and strategic trade-offs, including opportunity costs	NA
Limitations	#16a	Limits to the generalizability of the work	20,21
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Conclusion	#17b	Sustainability	21
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