Abstract: Measuring mistreatment and quality of care during childbirth is important in promoting respectful maternity care. We describe these dimensions throughout the birthing process from admission, delivery and immediate postpartum care. We observed 677 client–provider interactions and conducted 13 facility assessments in Kenya. We used descriptive statistics and logistic regression model to illustrate how mistreatment and clinical process of care vary through the birthing process. During admission, the prevalence of verbal abuse was 18%, lack of informed consent 59%, and lack of privacy 67%. Women with higher parity were more likely to be verbally abused [AOR: 1.69; (95% CI 1.03, 2.77)]. During delivery, low levels of verbal and physical abuse were observed, but lack of privacy and unhygienic practices were prevalent during delivery and postpartum (>65%). Women were less likely to be verbally abused [AOR: 0.88 (95% CI 0.78, 0.99)] or experience unhygienic practices, [AOR: 0.87 (95% CI 0.78, 0.97)] in better-equipped facilities. During admission, providers were observed creating rapport (52%), taking medical history (82%), conducting physical assessments (5%). Women’s likelihood to receive a physical assessment increased with higher infrastructural scores during admission [AOR: 2.52; (95% CI 2.03, 3.21)] and immediately postpartum [AOR 2.18; (95% CI 1.24, 3.82)]. Night-time deliveries were associated with lower likelihood of physical assessment and rapport creation [AOR; 0.58; (95% CI 0.41, 0.86)]. The variability of mistreatment and clinical quality of maternity along the birthing process suggests health system drivers that influence provider behaviour and health facility environment should be considered for quality improvement and reduction of mistreatment. DOI: 10.1080/09688080.2018.1502018

Keywords: mistreatment, respect, quality, childbirth, continuum of care, measurement

Introduction

Recent developments in measuring mistreatment of women during childbirth reflect the importance and growing interest globally in promoting respectful maternity care. While others have argued that preventing mistreatment is not the same as enhancing respectful care, the need to improve women’s interactions with healthcare providers remains central to ensuring service quality which also resonates with cultural and normative standards. Integral to this process is the adoption of clinical guidelines and professional standards, which form a vision for a health system that is people-centred, responsive and effective for both the mother and her newborn. The 2016 World Health Organisation (WHO) Standards for improving quality of maternal and newborn care in health facilities encompasses both the provision and experience of care, as well as key health care system functions. It provides a useful framework for defining the clinical needs of mothers and newborns, from evidence-based medical practice to effective communication, respect, and emotional support. Incorporating and measuring these broad categories during facility-based childbirth elucidates both the clinical process of care and mistreatment that occurs throughout the birthing process.
Different research methods have been used to document women’s experiences with limited quantitative instruments to measure the incidence and characteristics of respectful maternity care (RMC). The last few years have seen an increasing number of studies documenting prevalence of mistreatment during childbirth.2-4,8-12 Some studies have quantified the occurrence of mistreatment ranging from the development and psychometric testing of a 15 item scale that assesses RMC over four dimensions: friendly care, abuse-free care, timely care and discrimination-free care,13 while others examine women’s autonomy and their role in decision making throughout the course of pregnancy.14 The complexity of measuring mistreatment during childbirth within the context of quality improvement is influenced by the challenge of measurement errors including imperfect test errors, desirability errors, recall-related errors or selection bias of the study population as well as the cost of identifying objective deviations to quality standards.15 Other studies have attempted to measure mistreatment using structured observation checklists within the context of improving quality of care and indicate discrepancies between observed client-provider interactions and exit interviews, the former indicating a higher prevalence of mistreatment.4,11,12,16 Client underreporting has been associated with women’s low expectation and awareness of quality of care, and facility “courtesy bias” where women are interviewed on site (even if in a private room). Other studies have shown that when women are interviewed in community settings 2-6 weeks postpartum the prevalence is higher but still lower than that of the observed mistreatment.3 Alternatively, observers may overreport mistreatment because they are primed through training to specifically monitor interactions for any instances of disrespect and abuse.12,16,17

Using a structured checklist to measure standards of care is a rigorous and pragmatic approach in the context of quality improvement. WHO efforts to develop standards of quality of care7 and promote RMC17 indicate the need to provide and monitor people-centred care. As such, quality monitoring needs to capture both clinical and normative standards of care provision, including preservation of women’s dignity in childbirth. Understanding mistreatment and clinical quality during childbirth requires segmented investigation of RMC and clinical standards and processes across the stages of facility birth. Structured facility-based observations allow an opportunity for monitoring quality by assessing provider adherence to clinical standards as well as illuminating the prevalence of mistreatment before, during, and immediately after childbirth. To further the evidence on how this approach identifies the quality of care gaps that can be used to promote RMC7,16 this study uses structured observations collected within the Heshima project18 to illustrate the occurrence of mistreatment during childbirth and the quality of clinical processes in four counties in Central and Western Kenya. The objective of this study is to describe how mistreatment of women and clinical process of care vary throughout the birthing process from admission, delivery and immediate postpartum care.

Methods

Study design

The Heshima project measured the prevalence of disrespect and abuse during childbirth through exit interviews conducted between September and October 2011.2 Data used for this paper draw from the cross-sectional observational study which builds on the prevalence study of observed interactions between providers and women across the labour and birthing process in 13 health facilities. The study was conducted as part of the baseline, before the multi-level intervention was designed and implemented.18

Study setting

The 13 purposively selected facilities constituting different facility types (public, private, faith-based) and different levels of care, comprised three public referral hospitals, three district (public) hospitals with maternity units, two faith-based hospitals, two private nursing homes, and one (public) health centre. Four of the 13 facilities were rural, and the rest were in urban or peri-urban areas. The study facilities employed 58 specialist doctors, 116 medical doctors, 1503 nurses or midwives, 27 theatre nurses, 48 anesthetists, and 126 pharmacists. The 13 facilities, combined, had 21 delivery couches and a total bed capacity of 194 in the labour units. Outpatient health facilities (health centres or clinics) had only one nurse or midwife per shift, while larger ones (hospitals) employed 9-11 per shift (see Supplementary Table 1).
Data collection procedures

About 30 researchers (trained nurses/midwives) conducted structured observations of women and their interactions with providers (primarily nurse/midwives) from early labour to post-delivery, to understand the occurrence of mistreatment and the quality of clinical processes throughout the birthing continuum. The nurse/midwife researchers were specifically recruited as non-participant observers from outside the study facilities and counties. They received a week-long training in observational methods and practised using the checklist prior to data collection. They were also encouraged to document any issues in field memos that helped to reflect on their potential biases on the data collection process. During data collection, nurse/midwife researchers participated in daily debriefs with the study teams to discuss their field memos. Additionally, we used data from the facility inventory to assess structural requirements for delivery services. In this paper, we utilise two main dimensions of quality of care: structural dimension of quality (derived from the facility assessment) as well as clinical process (derived from the client-provider observations during the birthing process). Details of the structural elements of care assessed are presented in Supplementary Table 2.

To measure clinical process of care and mistreatment throughout the birthing process, pregnant women were recruited during early labour (defined as cervical dilation of 0-3 cm, contractions in the range of 5–20 minutes and lasting for about 30–45 seconds) and observed throughout the labour and delivery continuum to the immediate postpartum period (up to one hour post-delivery). Given the sensitive subject matter and that this was the first study to examine this potentially controversial issue in Kenya, following discussion with the Ministry of Health, we were cautious in recruiting women and delivery partners at 4 cm cervical dilation and above. We could not guarantee that women would fully understand and be able to provide informed consent in an ethical manner, given that they may have diminished ability to recall and retain information during labour. Women aged 15–45 years, who provided their informed consent during early labour, for observation of their labour and delivery, were observed using a structured, non-participant observation checklist in the maternity units.

Information collected related to both process (how patients were treated) and content (what they were told, revealing technical competency, accuracy of information and provision of essential information) of services. For any life-threatening situations that would endanger the patient, observers were trained to stop the observation and intervene by providing immediate emergency care. A list of potential clinical and life-threatening situations (e.g. facility nurse unavailable at second stage labour, vaginal bleeding) were developed with the Ministry of Health (MoH) and discussed during training. In such situations, the observers were cleared to intervene in life-threatening situations, and observations were discontinued and excluded from the analysis. Anonymous reports of any observed poor clinical process of care were given to the facility in-charges at the end of the data collection period.

To assess the health facility’s structural capacity to provide delivery services, we conducted facility inventories. Trained nurses/midwives and clinical officers with experience in obstetric care used a checklist to assess the availability of equipment, supplies and infrastructure in the study facilities. They verified that items exist by observing and documenting them. The list of attributes assessed is presented in Supplementary Table 2.

Data analysis

Measures of mistreatment for this assessment were collected during the birthing process and categorised using the WHO typology at the analysis stage. Data were retrospectively mapped to the WHO typology. For example, three second order themes were assessed during admission: harsh language, lack of informed consent and lack of privacy. During delivery, four second order themes were examined: harsh language, use of force, unhygienic conditions (these were defined as the basic requirement a provider must adhere to as part of broader infection control practices regardless of level of care), and lack of privacy. During immediate postpartum care, three second order themes were assessed: unhygienic conditions, lack of privacy and lack of informed consent (Table 1). A single measure (second or third order theme) combines the occurrence of any of the elements described as first order themes presented in Table 1. A combined score was dichotomised and used as an estimate of occurrence of mistreatment. The selection of second order themes was based on what could be retrospectively mapped to the data; those that did not show up in our...
| Stages of birth | Third order themes | Second order themes | First order themes |
|----------------|--------------------|---------------------|-------------------|
| Admission      | Verbal abuse       | Harsh language      | Provider did not use dignified language |
|                |                    |                     | Provider used harsh tone/shouted        |
|                | Failure to meet professional standards | Lack of informed consent | Provide did not obtain permission before examination |
|                |                    |                     | Provider did not explain what would be done |
|                | Physical examinations and procedures- Lack of privacy | No partitions between beds |
|                |                    |                     | Conducted examinations without privacy |
|                |                    |                     | Provider did not cover mother during examination |
| Delivery       | Verbal Abuse       | Harsh language      | Provider used abusive/harsh language |
|                | Physical abuse     | Use of force        | Provider slapped, pinched, / inappropriately handled client |
|                |                    |                    | Provider did not wash hands before conducting delivery |
|                | Failure to meet professional standards | Physical examinations and procedures- unhygienic practices | Provider did not wear gloves during delivery |
|                |                    |                     | Provider did not use one touch technique while using gloves |
|                |                     |                     | Mother was not covered when being moved to delivery room |
|                | Lack of privacy    |                     | Mother not covered except perineal area during delivery |
| Immediate postpartum | Failure to meet professional standards | Physical examinations and procedures Unhygienic practices | Provider did not wash hands during perineal examination |
|                |                     |                     | Provide did not wear gloves during perineal examination |
|                |                     |                     | Provider did not use antiseptic solution |
|                | Lack of privacy    |                     | Mother was not surrounded by a partition |
|                |                     |                     | Mother was not covered during the examination |
|                |                     |                     | Audio privacy was not respected |
|                |                     |                     | Visual privacy was not respected |
|                | Lack of informed consent | Provider did not explain procedure during perineal examination |
Structural dimensions of quality were assessed, with a maximum score of 52 elements (see supplementary Table 3) presented by sector (public or private sector). The second dimension was a clinical process of care derived from the client-provider-observation. Clinical process of care measures were specified for different stages of the birthing process. During admission, creating rapport (3 items), history taking (6 items), and physical assessment (6 items) were included. Eating, drinking and mobility (3 items) and infection prevention (7 items) were assessed during labour and delivery. These last reflected the ideal situation needed to avoid infection; the unhygienic practices construct is part of the infection prevention and includes the three most critical items that a provider should always maintain regardless of level or sector of care. Lastly, physical assessment (7 items) was included in the postpartum period. Clinical process measures were created by generating a single binary outcome that combined all the elements of each indicator shown in Table 2. A single percentage score was derived for each quality domain measured to represent whether providers adequately performed at each stage of birth as a proxy for adherence to clinical standards.

We recognise that WHO first order themes overlap between two third order themes “health systems conditions and constraints”, and “failure to meet professional standards” and are often combined when looking at actual experiences of mistreatment. This analysis uses the WHO typology around mistreatment" and quality of MNH care framework" to understand how observed quality (infrastructure and clinical care) and mistreatment align.

To generate an infrastructural score, data from the facility inventory were aggregated to form a continuous index with a maximum score of 52 elements. This index was developed to assess the essential structural components (or inputs) required to provide quality delivery care. We defined the minimum list of equipment required to provide delivery and immediate postpartum care services, based on MoH guidelines. This included supplies and medicines, basic equipment for physical assessment of women, infection control requirements and the staff deployed in the maternity units. Composite scores were generated by combining several indicators into a single score," using the “Opportunity Model” which is based on the percentage of functions (“quality indicators”) actually available relative to the total number of targeted ones. The aggregate scores of all infrastructural elements are used to assess whether targeted functions are achieved. To measure the overall score of the facility, all the attributes were added with equal weights to create a composite structural score with a maximum of 52 points. This score was useful in two ways: first it was used as a covariate to examine the influence of structural components on technical quality of care as defined in Table 2. The second use was to examine the effects of structural components on the type of mistreatment. In both cases this was regressed against the outcome variables as a continuous variable and not dichotomised. The details of the elements used to generate the score and the outcomes per set of items is presented in Supplementary Table 3.

Descriptive statistics were computed using simple frequencies of occurrence of the composite elements of clinical process and the categories of mistreatment throughout the birthing process. In addition, characteristics of client and health system observed, including age, parity, time of delivery (day/night), and sector (Table 3) are used as covariates. A multivariate fixed-effects logistic regression model that accounted for facility clustering examined the relationship between the types of mistreatment and clinical elements of care with demographic and delivery characteristics. Results are presented as adjusted odds ratios (AOR). For example, an AOR of more than 1 signifies an increased likelihood of experiencing mistreatment reported by individual-level attributes (age, parity, time and facility sector). Although multicollinearity test revealed that facility sector (public or private), and age had variable inflation factor greater than 3, they were not dropped for two reasons. First, the inclusion of private sector with few numbers (leading to wide confidence intervals) was important to illustrate the extent of mistreatment in either sector. Second, the age category was based on qualitative data that women below 19 years may be treated differently from older women. We report the adjusted odds ratio (AORs) despite these limitations.

The research protocol was approved by the Division of Reproductive Health of Kenya’s Ministry of Public Health and Sanitation, as well as the Kenya Medical Research Institute (KEMRI)’s Ethical Review Board (SCC 288) and Population Council’s Institutional Review Board (Protocol 517).
Table 2. Clinical quality measured throughout birthing process.

| Stages of birth          | Quality domain                        | Indicators                                                                 |
|--------------------------|---------------------------------------|-----------------------------------------------------------------------------|
| Admission                | Creating Rapport (0-3)                 | Client welcomed in a gentle manner                                          |
|                          |                                       | Called client by name                                                       |
|                          |                                       | Client told which bed to go                                                 |
|                          | Medical History taking practices (0-6) | Asked about personal history                                                |
|                          |                                       | Asked about present history                                                 |
|                          |                                       | Took obstetric history                                                      |
|                          |                                       | Took past medical history                                                   |
|                          |                                       | Asked about surgical history                                                |
|                          |                                       | Took family history                                                         |
|                          | Physical assessment (0-6)              | Took blood pressure                                                         |
|                          |                                       | Pulse rate taken                                                            |
|                          |                                       | Temperature taken                                                           |
|                          |                                       | Examined legs                                                               |
|                          |                                       | Examined abdomen                                                            |
|                          |                                       | Checked fetal heart sounds                                                  |
| Delivery                 | Practices on eating, drinking and     | Client was allowed to drink                                                  |
|                          | movement (0-3)                         | Provider allowed her to move                                                 |
|                          |                                       | Client was allowed to eat                                                   |
|                          | Infection prevention practices during  | Provider washed hands before delivery                                        |
|                          | delivery (0-7)                         | Provider used gloves during delivery                                         |
|                          |                                       | Provider used non-touch technique method when using gloves                   |
|                          |                                       | Provider swabbed perineum with antiseptic solution                           |
|                          |                                       | Providers wore over shoes/delivery room slippers/boots                      |
|                          |                                       | Providers wore sterile gown                                                  |
|                          |                                       | Provider wore plastic gown (mackintosh)                                     |
| Immediate postpartum     | Physical assessment of mother after    | Confirmed uterine contracting                                               |
|                          | delivery (0-7)                         | Checked pulse rate                                                          |
|                          |                                       | Provider took blood pressure                                                |
|                          |                                       | Checked amount of vaginal bleeding                                           |
|                          |                                       | Took temperature                                                            |
|                          |                                       | Examined fundal height                                                       |
|                          |                                       | Examined uterine tone                                                       |
Results

The majority of the 677 clients observed were relatively young. 68% were between 20-29 years and had either no (43.5%) or just one to two (45.6%) previous births. Nearly two-thirds of the clients gave birth during the day (Table 3).

Mistreatment and clinical quality throughout the birthing process

The prevalence of various categories of mistreatment varied with type and stages of birth. During admission, verbal abuse was recorded in 18% of the observations, while lack of privacy was observed in 67% of interactions; and 59% observed a lack of informed consent. During delivery, only 9.3% and 5.4% of client-provider interactions observed verbal and physical abuse, respectively, by the provider; however, lack of privacy and unhygienic practices were quite prevalent during delivery and in the immediate postpartum period (78% and 75%; and 88% and 68%, respectively). Lack of informed consent was particularly high (95%) in the immediate postpartum period.

During the admission stage, about half (52%) the providers were observed to have attempted to create rapport with the women (Table 4). Providers performed well in taking personal, obstetric, surgical, and medical history as seen in 82% of the observed interactions. Contrastingly, in only 15% and 7% of the observations were physical assessments conducted during admission and immediate postpartum periods, respectively. During labour and delivery, when not contraindicated, among women who wanted to drink (n = 264), eat (n = 129) or asked permission to walk around (n = 108), only 17% were allowed to either drink, eat or move around. Less than 3% of providers were observed to have practised basic infection preventative behaviours during labour and delivery.

Mistreatment associations throughout the birthing process

Associations between the prevalence of mistreatment and covariates show that there were no associations between the various categories of mistreatment during the admission stage, except women who had one or two previous births were more likely to be verbally abused compared with those with no previous children; AOR: 1.69 (95% CI 1.03, 2.77). During delivery, in facilities with higher infrastructural scores, women were less likely to be verbally abused: AOR: 0.88 (95% CI 0.78, 0.99) or experience unhygienic practices: AOR: 0.87 (95% CI 0.78, 0.97), but women aged between 20 and 29 years were more likely to experience lack of privacy AOR: 1.71 (95% CI 1.02, 2.86) compared to women aged less than 19 years. All other covariates did not exhibit any associations during this stage.

During the immediate postpartum period, there was a positive association between lack of informed consent and infrastructural scores; AOR: 1.50 (95% CI 1.05, 2.16). Women with three or more children were less likely to experience lack of informed consent compared to those with no previous children, AOR: 0.09 (95% CI 0.02, 0.42). Women were more likely to lack informed consent for examinations and receive postpartum care if they delivered during the night: AOR: 6.24 (95% CI 2.13, 18.25). The wide confidence interval is likely due to the number of women who delivered at night compared to

Table 3. Socio-demographics and delivery characteristics of maternity care clients whose care was observed in 13 facilities in Kenya, N = 677

| Demographics | % (n = 677) |
|--------------|------------|
| **Age**      |            |
| < 19 years   | 15.3 (103) |
| 20–29 years  | 67.5 (454) |
| 30+ years    | 17.2 (116) |
| **Parity**   |            |
| 0            | 43.5 (291) |
| 1–2          | 45.6 (305) |
| 3+           | 10.9 (73)  |
| **Time of delivery** | |
| Night        | 32.9 (223) |
| Day          | 67.1 (454) |
| **Facility sector** | |
| Public       | 94.2 (637) |
| Private       | 5.9 (40)   |

*aMissing values < 2%.

*bFaith based or private clinics.
daytime. Finally, although sample size was small, those who delivered in the private sector facilities were more likely to experience unhygienic practices during postpartum assessment: AOR: 13.4 (95% CI 1.24, 145.8) compared to the public-sector deliveries. This warrants exploration in future analyses to further elucidate differences between sectors in immediate postpartum care.

Clinical quality associations throughout the birthing process

Associations exist between clinical quality elements and the covariates across the birthing process, particularly with respect to physical assessment, creating rapport and infection prevention (Table 5). In both admission and immediate postpartum periods, women were more likely to be physically assessed in facilities with higher infrastructural scores: AOR: 2.52 (95% CI 2.03, 3.21) and AOR: 2.18 (95% CI 1.24, 3.82), respectively. Women over 30 years of age were less likely to be physically assessed during the immediate postpartum compared to those less than 19 years of age; AOR: 0.51 (95% CI 0.30, 0.89). There was a greater likelihood of women receiving an initial physical assessment at night than those who came in during the day; AOR: 2.32 (95% CI 1.28, 4.21). Despite this, women who delivered at night were less likely to experience good rapport with their providers compared to those who gave birth during the day; AOR: 0.58 (95% CI 0.41, 0.86). Finally, women who gave birth in the private sector, were less likely to experience adequate infection control practices during labour and delivery as well as receive a postpartum physical assessment; AOR: 0.002 (95% CI 0.00003, 0.11) and AOR: 0.11 (95% CI 0.03, 0.40), respectively; however, again the small sample size and wide confidence intervals suggest caution when drawing conclusions from these results (Table 6).

Discussion

Our findings demonstrate variability in the prevalence and predictors of observed mistreatment and clinical quality across admission, delivery and immediate postpartum stages of maternity care.
At admission, providers demonstrate high clinical quality in taking medical histories, moderate quality in creating rapport and low quality in conducting physical assessments. Mistreatment measures at admission suggest challenges of lacking privacy, confidentiality and consent. These observations indicate that mistreatment and lack of adherence to protocols are likely to be associated with systemic inadequacies, such as availability of instruments necessary for conducting physical assessments or structural barriers to ensuring privacy, a factor that drives mistreatment of care. Further, it illustrates that measuring mistreatment using structured observations illuminates how the pervasiveness of system deficiencies reflects normalisation of provider practices and interactions with clients that may deviate from standards of care. 

During labour and delivery, restrictions on mobility and poor infection prevention (clinical quality) align with high levels of unhygienic practices and lack of privacy (mistreatment). These observations are crucial in two aspects; first, observed poor infection control practices (clinical) and unhygienic practices (mistreatment) may contribute to high sepsis-induced morbidity and mortality among women during childbirth. At 10%, sepsis is estimated as the third contributor to maternal deaths in sub-Saharan Africa, after hemorrhage (25%) and hypertensive disorders of pregnancy (16%). Second, the fact that hygiene practices were associated with infrastructural scores, specifically that institutions scoring higher were less likely to engage in unhygienic practices during delivery (AOR 0.87, 95% CI 0.78, 0.97), suggests that system deficiencies are a driver of poor quality of care, and that strengthening these may improve quality of services implicitly influencing maternal outcomes. However,

| Table 5. Multivariate logistic assessing factors for observed clinical quality of care throughout the birthing process among maternity care clients |
|---------------------------------------------------------------|
| **Infrastructural score**                                      | **Creating rapport** | **Medical history taking** | **Physical assessment** | **Practices: eating, drinking, movement** | **Infection prevention practices** | **Physical assessment of mother** |
|                                                               | AOR (95% CI)         | AOR (95% CI)               | AOR (95% CI)           | AOR (95% CI)                              | AOR (95% CI)                     | AOR (95% CI)                     |
| Admission AOR (95% CI)                                        | 1.09 (0.94, 1.27)    | 1.05 (0.85, 1.28)          | 2.52 (2.03, 3.21)      | 1.48 (0.93, 2.35)                         | 4.15 (0.62, 27.3)                | 2.18 (1.24, 3.82)                |
| During delivery AOR (95% CI)                                  | 1.05 (0.94, 1.27)    | 1.05 (0.85, 1.28)          | 2.52 (2.03, 3.21)      | 1.48 (0.93, 2.35)                         | 4.15 (0.62, 27.3)                | 2.18 (1.24, 3.82)                |
| Practices: eating, drinking, movement AOR (95% CI)            | 1.48 (0.93, 2.35)    | 1.48 (0.93, 2.35)          | 1.48 (0.93, 2.35)      | 1.48 (0.93, 2.35)                         | 1.48 (0.93, 2.35)                | 1.48 (0.93, 2.35)                |
| Infection prevention practices AOR (95% CI)                   | 4.15 (0.62, 27.3)    | 4.15 (0.62, 27.3)          | 4.15 (0.62, 27.3)      | 4.15 (0.62, 27.3)                         | 4.15 (0.62, 27.3)                | 4.15 (0.62, 27.3)                |
| Physical assessment of mother AOR (95% CI)                    | 2.18 (1.24, 3.82)    | 2.18 (1.24, 3.82)          | 2.18 (1.24, 3.82)      | 2.18 (1.24, 3.82)                         | 2.18 (1.24, 3.82)                | 2.18 (1.24, 3.82)                |
| **Age (ref: <19 years)**                                      | 0.79 (0.37, 1.69)    | 1.86 (0.95, 3.62)          | 0.83 (0.31, 2.22)      | 1.54 (0.62, 3.84)                         | 0.23 (0.004, 11.59)              | 1.01 (0.71, 1.43)                |
| 20–29 years                                                  | 2.30 (0.89, 5.91)    | 1.51 (0.88, 2.57)          | 0.47 (0.22, 1.02)      | 0.47 (0.005, 50.32)                       | 0.51 (0.30, 0.89)                | 1.62 (0.91, 2.89)                |
| 30+ years                                                    | 0.87 (0.45, 1.69)    | 2.30 (0.89, 5.91)          | 1.51 (0.88, 2.57)      | 0.47 (0.22, 1.02)                         | 0.47 (0.005, 50.32)              | 0.51 (0.30, 0.89)                |
| **Parity (ref: first child)**                                 | 0.95 (0.63, 1.44)    | 1.13 (0.59, 2.16)          | 0.92 (0.58, 1.43)      | 1.12 (0.50, 2.51)                         | 2.27 (0.40, 12.69)               | 1.62 (0.91, 2.89)                |
| 1–2 children                                                  | 0.60 (0.29, 1.23)    | 0.68 (0.32, 1.45)          | 0.27 (0.04, 1.74)      | 1.67 (0.64, 4.42)                         | 1.79 (0.71, 4.47)                | 1.04 (0.31, 3.46)                |
| 3 or more children                                           | 0.60 (0.29, 1.23)    | 0.68 (0.32, 1.45)          | 0.27 (0.04, 1.74)      | 1.67 (0.64, 4.42)                         | 1.79 (0.71, 4.47)                | 1.04 (0.31, 3.46)                |
| Time of delivery (ref: day)                                  | 0.58 (0.41, 0.86)    | 1.25 (0.88, 1.79)          | 2.32 (1.28, 4.21)      | 0.53 (0.26, 1.06)                         | 1.23 (0.46, 3.28)                | 1.01 (0.72, 1.43)                |
| Night                                                        | 0.27 (0.04, 1.74)    | 1.67 (0.64, 4.42)          | 1.79 (0.71, 4.47)      | 1.04 (0.31, 3.46)                         | 1.79 (0.71, 4.47)                | 1.04 (0.31, 3.46)                |
| **Facility sector (ref: public)**                            | 1.62 (0.02, 1.66)    | 2.71 (0.27, 27.0)          | 0.14 (0.02, 1.14)      | 6.36 (0.13, 310.7)                        | 0.002 (0.00003, 0.11)            | 0.11 (0.03, 0.40)                |
| Private                                                      | 1.62 (0.02, 1.66)    | 2.71 (0.27, 27.0)          | 0.14 (0.02, 1.14)      | 6.36 (0.13, 310.7)                        | 0.002 (0.00003, 0.11)            | 0.11 (0.03, 0.40)                |
Table 6. Multivariate logistic assessing risk factors for observed incidences of mistreatment among maternity care clients

|                          | Admission AOR (95% CI) | During delivery AOR (95% CI) | Immediate postpartum AOR (95% CI) |
|--------------------------|------------------------|------------------------------|-----------------------------------|
|                          | Verbal abuse           | Lack of informed consent     | Lack of privacy                   | Physical abuse | Lack of privacy | Unhygienic practices | Unhygienic practices | Lack of privacy | Lack of informed consent |
| Infrastructural score    | 0.93 (0.83, 1.04)      | 0.92 (0.74, 1.14)            | 0.092 (0.79, 1.06)               | 0.88 (0.78, 0.99) | 0.88 (0.76, 1.03) | 0.90 (0.71, 1.14) | 0.87 (0.78, 0.97) | 0.85 (0.65, 1.14) | 0.87 (0.56, 1.36) | 1.50 (1.05, 2.16) |
| Age (Ref: < 19 years)    | 0.76 (0.43, 1.34)      | 0.79 (0.43, 1.45)            | 0.72 (0.43, 1.21)               | 0.89 (0.52,1.53) | 0.49 (0.25, 1.00) | 1.71 (1.02, 2.86) | 1.51 (0.91, 2.51) | 0.85 (0.11, 6.25) | 1.21 (0.84, 17.42) | 0.22 (0.07, 0.71) |
| 20–29 years              | 0.53 (0.26, 1.05)      | 0.66 (0.39, 1.11)            | 1.05 (0.49, 2.24)              | 1.29 (0.59,2.83) | 0.45 (0.12, 1.74) | 1.36 (0.72, 2.58) | 1.27 (0.76, 2.14) | NE                | 4.09 (0.14, 122.4) | 0.15 (0.11,2.23) |
| 30+ years                | 1.69 (1.03, 2.77)      | 1.19 (0.81, 1.72)            | 0.92 (0.73, 1.16)              | 0.98 (0.66,1.45) | 0.99 (0.54, 1.81) | 1.06 (0.71, 1.59) | 0.85 (0.51, 1.42) | 0.24 (0.06, 0.98) | NE                | 1.74 (0.38,7.88) |
| Parity (ref: first child)| 2.01 (0.92, 4.39)      | 1.56 (0.94, 2.56)            | 1.10 (0.60, 2.02)              | 0.97 (0.42,2.26) | 0.87 (0.26, 2.83) | 1.03 (0.55, 1.92) | 1.15 (0.43, 3.08) | 1.32 (0.021,80.68) | NE                | 0.09 (0.02, 0.42) |
| 1–2 children             | 1.39 (0.71, 2.72)      | 1.41 (0.95, 2.08)            | 0.96 (0.70, 1.31)              | 1.63 (0.88,2.98) | 1.84 (0.90,3.76) | 0.78 (0.41, 1.49) | 1.11 (0.63, 1.98) | NE                | NE                | 6.24 (2.13, 18.25) |
| Time of delivery         | 0.98 (0.12, 7.78)      | 2.82 (0.33, 23.9)            | 0.33 (0.02, 4.53)              | 0.60 (0.18, 1.93) | 1.34 (0.12, 14.27) | 5.10 (0.43, 59.71) | 7.14 (0.98, 51.96) | 13.49 (1.24,145.8) | 3.85 (0.27, 54.16) | 2.62 (0.22, 31.0) |
| (ref = day)              | Night                  |                              |                                |                      |                  |                   |                    |                   |                   |                   |
| Facility sector          | 0.98 (0.12, 7.78)      | 2.82 (0.33, 23.9)            | 0.33 (0.02, 4.53)              | 0.60 (0.18, 1.93)  | 1.34 (0.12, 14.27) | 5.10 (0.43, 59.71) | 7.14 (0.98, 51.96) | 13.49 (1.24,145.8) | 3.85 (0.27, 54.16) | 2.62 (0.22, 31.0) |
| (ref: public)            | Private                |                              |                                |                      |                  |                   |                    |                   |                   |                   |

Note: NE: not estimated due to small numbers the model could not run.
mistreatment observed as unhygienic practices are likely to be an individual-level behaviour, which suggests that such behaviours may persist even among better-resourced facilities, and that these inadequacies alone do not fully explain mistreatment during the birthing process. Further, improved hygiene practices during childbirth (or across the labour and childbirth continuum, in general) may necessitate incorporating both structural facility improvements and provider behaviour change interventions.

Predictors of mistreatment also varied throughout the birthing process, indicating different drivers at each stage, and are important to consider while developing interventions to promote RMC. During admission, women with higher parity were more likely to be verbally abused than those with no children. Qualitative data have shown manifestations of verbal abuse include harsh words and insulting language towards the pregnant women by providers. While factors during delivery were influenced by infrastructural scores, with a higher score being associated with both lower risk of physical abuse, and unhygienic practices. Finally, in the immediate postpartum period, the likelihood of unconsented vaginal examinations increases with infrastructural score and at night, and decreases among high parity women. The significantly increased odds of lacking informed consent among night time deliveries are likely a consequence of staff fatigue and having fewer staff available during these hours – leading to rushed or neglectful care. In Tanzania, for example, providers did not always wake up for night deliveries and those who are in the wards may be less responsive to women’s calls for assistance.

Overall, these results suggest that drivers of mistreatment may be embedded in system deficiencies, such as staff shortage, inadequate provider capacity, lack of physical space and are compounded by provider attitudes, stress and burn out. Unique RMC-demotivating factors may require strategically nuanced solutions.

Clinical quality is significantly affected by the timing during admission, with providers being less likely to create rapport but more likely to conduct a physical assessment at night. This suggests that where there are fewer providers working during the night shift, there may be greater individual accountability for childbirth outcomes. On the other hand, less oversight of providers at night may foster potential latitude to engage in mistreatment or abusive care. In the immediate postpartum period, positive predictors of clinical quality include infrastructural score and higher parity, while negative predictors include being over 30 years and delivering in the private sector. This challenges underlying assumptions that clinical quality is generally better in the private sector; however, given the small numbers and resulting wide confidence intervals, further comparisons are needed to better assess variance within and between private sector institutions and public/government facilities. Despite the need for caution in interpreting results for sector differences, these findings reinforce the fact that to maintain adequate clinical quality and ensure RMC is provided, health system functions are critical to quality maternal outcomes. Strategies addressing human resource constraints, effective human resource management strategies at a micro level, and the strengthening of infrastructural aspects including supply chain are required to improve quality.

Overall, these findings underscore that failure to meet professional standards as a category of mistreatment is largely associated with limited structural elements of care. Thus health system drivers are critical elements to improve not only quality of care but also reduce mistreatment during childbirth. Our study used the Bohren framework of mistreatment during childbirth, which was retrospectively applied to the data during the analysis phase as many of our indicators aligned with the first, second and third order themes. Use of the framework post hoc also means that the numbers used to compute estimates for certain categories were limited, hence, generating wide confidence of the adjusted odds ratios. Our robust analysis and tests of multicollinearity enabled us to identify the limitations of the study and where applicable, the need to interpret it with caution. Despite these limitations our study demonstrates the challenge of distinguishing clinical quality domains from mistreatment categories. For example, unhygienic practices and infection prevention are mutual subsets, this reflects a conceptual overlap between some of the elements of clinical quality and mistreatment (as measured in this paper). Likewise, restrictions on mobility could be interpreted as mistreatment, specifically loss of autonomy, or as poor clinical quality. This means there is room for increasing specificity of both sets of measurements and focusing on areas of research and programming that jointly affect both clinical quality of care and experience of mistreatment as a function of the inadequacies of the system.
Despite these limitations, our study shows that measuring mistreatment using structured observations has three main utilities. First, it enables examining other aspects of quality of care which illuminate the dynamics of care-giving and the attributes of mistreatment throughout the birthing process. For example, relational indicators of positive and negative interaction measured in clinical quality and mistreatment components are critical to further assess at the admission stage, recognising that discrimination or differential treatment based on contextual factors (time of delivery or staffing) play a role. On the other hand, aspects of hygiene, infection prevention, fidelity to protocols, and privacy may prevail in the labour and delivery phase. In the post-partum phase, discrimination in physical assessment or variable consent and hygienic practices (by age or other unassessed characteristics) likely relate to infrastructural constraints. This is particularly valuable when considering that mistreatment and clinical quality of care appear to vary across the birthing process, as understanding the differences can guide hypotheses for potential drivers and support the development of targeted interventions. Second, using structured observations can help validate methods used to examine mistreatment of care, as was illustrated in Tanzania when comparing exit and structured observations in the context of initiatives that aim to promote RMC.3 Finally, it illustrates areas for improving quality of care which will influence mistreatment as well and thus promote RMC. As described in the WHO Quality of Care Framework for maternal and newborn health,30 examining the quality of care which includes the provision of care (clinical quality) together with experience of care (mistreatment) may highlight opportunities for complementary interventions to drive synergistic improvement in both quality dimensions. In the context of interpretable frameworks, measurability – particularly through observation – poses challenges, as noted from the overlap in illustrative indicators for clinically sound and respectful care. Optimal methods to measure these aspects of clinical quality and mistreatment may require mixed approaches.

Conclusion
Variability exists in the prevalence and predictors of observed mistreatment and clinical quality across admission, delivery and immediate postpartum stages of maternity care. Measuring mistreatment throughout the birthing process illuminates the types and drivers of mistreatment and gaps in clinical quality of care that require innovative interventions to address. It reaffirms the centrality of manifestations of mistreatment of care as a good predictor of the need for quality improvement. Effect variability suggests health system drivers that influence provider behaviour and health facility environment should be considered as target areas for improving quality of care and reducing the prevalence of mistreatment.

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No potential conflict of interest was reported by the authors.

Supplementary material
Supplemental data for this article can be accessed https://doi.org/10.1080/09688080.2018.1502018.

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Résumé
Il est important de mesurer la maltraitance et la qualité des soins pendant l’accouchement pour promouvoir des services de maternité respectueux. Nous décrivons ces dimensions tout au long des études de recherche sur le sujet.

Resumen
La medición del maltrato y la calidad de la atención brindada durante el parto es importante para promover atención materna respetuosa. Describimos estas dimensiones a lo largo del proceso de investigación.
long de l’accouchement depuis l’admission, la délivrance et les soins immédiats du post-partum. Nous avons observé 677 interactions entre clientes et prestataires et réalisé 13 évaluations de centres au Kenya. Nous avons utilisé des statistiques descriptives et un modèle de régression logistique pour illustrer comment la maltraitance et le processus clinique des soins varient au cours de l’accouchement. Pendant l’admission, la prévalence des violences verbales était de 18%, l’absence de consentement éclairé 59% et le manque d’intimité 67%. Les femmes à parité plus élevée risquaient davantage des violences verbales [RCA : 1,69; (95% IC 1,03, 2,77)]. Pendant la délivrance, de faibles niveaux de violences verbales et physiques ont été observés, mais l’absence d’intimité et les pratiques peu hygiéniques étaient fréquentes pendant la délivrance et le post-partum (>65%). Les femmes couraient moins de risques d’être maltraitées verbalement [RCA : 0,88 (95% IC 0,78, 0,99)] ou de subir des pratiques non hygiéniques [RCA : 0,87 (95% IC 0,78, 0,97)] dans les structures mieux équipées. Pendant l’admission, les prestataires ont été observés alors qu’ils créaient un rapport (52%), établissaient le dossier médical (82%), réalisaient un examen physique (5%). La probabilité pour les femmes de faire l’objet d’un examen physique s’accroissait avec les scores plus élevés des infrastructures pendant l’admission [RCA : 2,52; (95% IC 2,03, 3,21)] et le post-partum immédiat [RCA 2,18; (95% IC 1,24, 3,82)]. Les accouchements de nuit étaient associés à une plus faible probabilité d’examen physique et de création de rapport [RCA : 0,58; (95% IC 0,41, 0,86)]. La variabilité de la maltraitance et de la qualité clinique de la maternité tout au long de l’accouchement indique qu’il faudrait tenir compte des facteurs du système de santé qui influencent le comportement des prestataires et l’environnement de la structure de santé pour améliorer la qualité et réduire la maltraitance.