

BMJ Open Quality Use of WHO standards to improve quality of maternal and newborn hospital care: a study collecting both mothers' and staff perspective in a tertiary care hospital in Italy

Marzia Lazznerini, Emanuelle Pessa Valente, Benedetta Covi, Chiara Semenzato, Margherita Ciuch

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WHO Collaborating Centre for Maternal and Child Health, Institute for Maternal and Child Health IRCCS Burlo Garofolo, Trieste, Italy

Correspondence to

Dr Marzia Lazznerini;
marzia.lazznerini@burlo.trieste.it

ABSTRACT

Background WHO developed a list of standards for improving maternal and newborn hospital care. However, there is little experience on their use, and no precise guidance on their implementation. This study aimed at documenting the use of the WHO standards for improving the quality of maternal and neonatal care (QMNC) in a tertiary hospital, Northeast Italy.

Methods The study was conducted between May 2016 and May 2018, in three phases: phase I—sensitisation and training of health professionals; phase II—data collection on the WHO standards through a survey among service users and providers; phase III—based on the findings of phase II, development of recommendations for improving the QMNC.

Results Overall, 101 health professionals were successfully trained. 1050 mothers and 105 hospital staff participated in the survey. Key indicators of QMNC (and related prevalence) from the mothers survey included: caesarean section (23.1%); episiotomy (18.3%); restrictions to free movements during labour (46.5%), lithotomy position for staff choice (69.3%); skin to skin (80.8%); early breast feeding (67.2%); information on newborn danger signs (47.2%); high satisfaction with QMNC (68.8%). Only 1.2% and 0.7% of women respectively reported discrimination or abuse. Key indicators (and prevalence) reported from staff included: availability of clinical protocols (37%); regular training (14%); health information system used for quality improvement (16.3%); training on effective communication (9.7%) and on emotional support (19.6%); protocols to prevent mistreatment and abuse (6.9%). On several indicators, the opinions of mothers on QMNC was better than those of staff. Overall, 55 quality improvement recommendations were agreed.

Conclusions Information on the WHO standards can be collected from both services users and providers and can be proactively used for planning improvements on QMNC.

INTRODUCTION

International agencies, governments and civil society organisations have recognised quality of care as a crucial aspect of human rights and as a key determinant of health outcomes and

of health services cost.^{1–6} Currently, there is a large debate on what are the most effective interventions to improve quality of maternal and newborn care (QMNC) in different settings. In high-income countries, in spite of a generally low maternal and newborn mortality when compared with low-income countries, still several challenges exist: studies show that the implementation of evidence-based practices is still suboptimal; there is a diffuse fear of litigation, with a risk of over-medicalisation; systems for monitoring and evaluating the QMNC using a comprehensive list of quantitative indicators are generally lacking; in general, mothers' perception of the experience of care is rarely included in the assessment of the QMNC, and rarely considered for planning purposes.^{7–10}

Among the initiatives aiming at improving the QMNC, in 2015 WHO developed a framework which defines the key components of quality hospital services for the mother and the newborn.¹¹ The WHO framework identifies two key dimensions of quality: 'provision of care'—including evidence-based practices, efficient information and referral systems and 'experience of care'—including effective communication, respect, dignity and emotional support. The cross-cutting areas of the framework include the availability of competent, motivated human resources and of the physical resources, identified as prerequisites for good quality of care in health facilities.¹¹ In 2016, based on this framework, a list of WHO 'Standards for improving maternal and newborn care in health facilities' was released.¹² The WHO standards define what healthcare planners, managers and care providers should ensure in order to guarantee high-quality care around the time of birth.¹² The WHO standards are declined

into 31 quality statements. For each quality statement a sets of quality measures is provided, for a total of 318 quality measures, including measures of inputs, output and outcomes.¹² The standards are to be used according the 'Plan Do Study Act' model, that is, conducting a baseline situation analysis, defining priorities for actions and interventions to improve care, monitoring progresses and refining the strategy.¹²

Currently, there is little experience on the use of the WHO standards, and detailed guidance on their implementation has not been released yet. WHO recommends that 'ideas for implementing the standards should be based on each country's experience and on adaptive learning within and between countries'. Local adaptation of the standards is also envisaged.¹² However, the precise source of information to be used for each quality measure, and the tool to be used to collect such information, are not clarified yet. The aim of this study was to explore as pilot experience methods for using the WHO standards for collecting information on the hospital QMNC from both service users (ie, mothers) and service providers (ie, hospital staff) and for reaching the stage of developing plans for improving QMNC in a participative manner.

METHODS

Study design

The study was designed as a quality improvement study and is reported according to the Standards for Quality Improvement Reporting Excellence guideline V.2.0^{13–15} (online supplementary table 1).

Context

The study was conducted between May 2016 and May 2018 in a large public tertiary level university hospital in Northeast Italy. Every year about 1700–1800 mothers give birth in the hospital.¹⁶

Intervention

The intervention included three main phases. Phase I was a sensitisation and training phase, where hospital staff was informed on key concepts of respectful care and on the existence of the WHO standards.^{12 17} Phase II aimed at conducting a situation analysis, in the form of a survey, among both service users (ie, mothers) and service providers (ie, hospital staff) to explore direct experience on QMNC around time of childbirth, using the WHO standards.¹² Phase III, based on the results of the survey, aimed at the identification of priorities for action and the development of recommendations, with a participatory approach, to improve the hospital QMNC.

Phase I: sensitisation and training

The primary objective of this phase was to raise attention on the subject of QMNC and to increase participation to the following phases. Four editions of a 1 day training courses were planned to cover key contents and ensure adequate participation, including national credits of continuous education (ECM). The course was adequately

advertised. Participation to the training was free of charges and open, on a voluntary basis, to all type of staff, both from hospital and outpatient, working with mothers or newborn, including doctors, registrars, nurses, midwives and midwifery undergraduate students.

Key subjects for training included: human rights and key definitions relevant to maternal and newborn healthcare (such as disrespect and abuse during childbirth)¹⁸; the WHO standards to the improve the QMNC and related key literature^{12 19 20}; the Respectful Maternity Care Charter¹⁷; epidemiology^{19 21–23} and underlying causes²⁰ of mistreatment of women during childbirth; key examples of evidenced-based practices (mostly using the WHO guidelines); key legal aspects of maternal and newborn healthcare (eg, general responsibility during care, legal aspects related to the concepts of autonomy and self-determination and the importance of effective communication for the informed consent). A team of specialists in the QMNC, with senior experience in the WHO guidelines/standards, and a layer expert in women rights acted as trainer. Methods of training included lectures and small group work sessions for case-study discussion (four case-study were developed for this purpose). For the ECM courses evaluation procedures included: i) a multiple-choice questionnaire for assessing participants final knowledge; ii) a standard national form to assess the general quality, effectiveness and additional value of the training according to participants evaluation.

Phase II: assessment of the QMNC

The primary objective of this phase was to conduct an assessment on the hospital QMNC. Both service users (mothers) and service providers (hospital staff) were involved, using two different questionnaires.

For the survey among mothers, mothers who gave birth in the hospital from December 2016 to May 2018 were invited to participate. Exclusion criteria were: maternal death, perinatal death (including stillbirth), refuse to participate, psychiatric or psychosocial problems with inability to fill in the questionnaire and age under 18 years. Data were collected using a field-tested, anonymous, self-administrated questionnaire in the local language (Italian) (see online supplementary table 2 for procedures of validation). The questionnaire, as well as the overall objectives of the study, was presented to the mothers in the postdelivery period, during their stay the postdelivery ward (usually <3 days after delivery), by a trained independent research midwife, not involved in case management. Mothers were enrolled from Monday to Saturday, and they could return the filled questionnaires directly to the operator, or in a dedicated box available in the ward 24/24hours and 7/7 days.

Data from the hospital staff were collected in the period from September to October 2017. All clinical staff working in the maternal and neonatal wards was included, with the exception of those absent from work on the long term (eg, maternity leave or long-term sick

leave) and those who refused to participate. Data were collected with the same procedures as for the mothers' questionnaire, using an anonymous, self-administrated questionnaire (see online supplementary table 2 for procedures of validation).

The two questionnaires accounted respectively for 120 questions (mothers questionnaire) and 121 questions (hospital staff questionnaire); all were multiple-choice apart from two final open questions. Overall, the two questionnaires included 29/31 (93.5%) of the WHO quality statements, for a total of 179/318 (56.3%) of the WHO quality measures. Overall, 16 quality statements were assessed using both the perspective of the service users and the service providers (see online supplementary table 3), but few quality measures were directly comparable.

Criteria used for the selection of the WHO quality standards are reported in online supplementary table 3. Briefly, they included relevance to the local context (ie, high-income country, with low maternal and newborn mortality); level of care provided (ie, tertiary level referral hospital); the expected feasibility and reliability of collecting the information from either service users or service providers. Other items included in the questionnaire aimed at collecting sociodemographic information on the individual (eg, age, education, etc) and at exploring more in-depth key aspects of respectful care (eg, informed consent, non-evidence-based interventions). Inclusion of these items in the questionnaires was guided by a review of existing literature.^{21–26}

Phase III: development of recommendations to improve the quality of care

The primary objective of this phase was the development of recommendations, with a participatory approach, to improve QMNC.

A 1-day workshop was organised in order to present results of the survey, identify main gaps in the QMNC and agree actions for improvement. Participants to this meeting included clinical and managerial staff, mostly those in the position to be decision-makers (eg, director general, executive director, scientific director, chiefs of department, chief nurses). Overall, 38 potential participants were preidentified, and actively sensitised to participate at the workshop for its full duration.

The agenda and the objectives of the workshop were clarified to participants in the weeks immediately before the start of the workshop, and at its start.

During the workshop, an action-oriented, participatory, non-blaming and supportive approach was chosen for building a problem-solving attitude among attenders, and for allowing a wide involvement of all type of staff. Data from similar studies in Italy and in other countries^{21–27} were presented to facilitate discussion, and to increase commitment through comparison with other experiences. In presenting the data, some information provided by the survey (eg, availability of local protocols according to staff) were commented through triangulation of

information from other sources (eg, direct evaluation of the availability of the protocols).

A predefined template for prioritisation of actions for quality improvement, containing also the instructions on how to fill it (see online supplementary table 4), was distributed at the beginning of the workshop and any related query was clarified. The template was developed in dialogue with the general direction, in order to include the following domains (in five columns): identified priorities, underlying causes, targets, proposed actions, organisational level responsible to implement the action and timelines. It was emphasised that the proposed actions for quality improvement had to be Specific, Measurable, Achievable, Realistic, Time-bound,²⁸ and had to include actions to be implemented in the following 2 years.

During the workshop the results of assessment of the QMNC were presented and time was allowed for plenary discussion. Participants were instructed to start filling the template (online supplementary table 4) individually during the presentation of the results of the survey. After the presentation, participants were divided into three working groups (maternal clinical staff, neonatal clinical staff and managerial staff). Hard copies of the survey results were provided. Each group was supported by an experienced group moderator, who facilitated team dynamics. A facilitator and a rapporteur were appointed at the start of the group work. Groups were allowed time for agreeing a group copy of the template. The summary of each group discussion was presented and discussed in plenary. After the workshop, few weeks were allowed to refine the final list of the recommendations developed by each group, which was circulated and approved by email.

Outcomes

According to the study phases the outcomes were identified as follows: phase I: number of staff successfully trained; phase II: prevalence of key indicators of QMNC; phase III: number of recommendations agreed to improve the QMNC.

Data analysis

Phase I main results were reported in text in a narrative manner.

During phase II data from the surveys were double entered by two trained researchers (BC, MC) on a dedicated Microsoft Office Excel database and any discrepancy was corrected in real time. The database was developed with a format very similar to those of the questionnaires, in order to minimise data entering errors. Interim analyses were performed monthly using Microsoft Office Excel. The enrolment rate was calculated, and the characteristics of missing cases were analysed (for the mothers' questionnaire these parameters were monitored monthly, extracted information on the missing variables from the labour ward register). Categorical variables were presented as absolute numbers and percentages. Continuous variables were expressed as means and ranges. Subgroup analyses were performed to evaluate

differences in the answers provided by hospital staff, by professional groups (ie, staff of the maternal area vs staff of the neonatal area). Unpaired categorical variables were compared with the Fisher's exact test or Yates corrected χ^2 , as appropriate. All statistical tests were two-sided. A p value <0.05 was considered to be statistically significant.

Results of phase III were reported in a narrative manner, in table and text.

Ethical considerations

Participants to the survey were informed about the objectives and methods of the study, including their rights in declining participation, and signed an informed consent before responding the questionnaires. Anonymity in data collection during the survey phase was ensured by not collecting any information that could disclose participants' identity.

Patient and public involvement statement

During the study design, a group of mothers, selected on a voluntary basis among women with a recent pregnancy, were involved in the construct validation of the questionnaire to be used for the survey among mothers (online supplementary table 2). In that phase, women had the opportunity to provide feedback on the questionnaire, and express freely their priorities, experience and preferences on the content of the questionnaire, including their views on its acceptability (eg, time needed to fill it, proposed methods of data collection). Inputs received from mothers were used to revise the content of the questionnaire, including reducing its length to improve

acceptability. During phase II of the study, mothers were involved as responders to the survey. Beside multichoice questions exploring mothers views, the questionnaire included open text questions, to capture additional aspect of women experience.

RESULTS

Phase I: sensitisation and training

Four editions of a 1-day training course were delivered from May to September 2016. Overall, 104 local health professionals attended the training course. Of these, 101 (97.1%) participants successfully completed assessment procedures and certification process, which include, according to the current Italian system, a postcourse verification of knowledge. The educational quality of the courses was rated as 'good/excellent' by 91 (87.5%) participants and as 'satisfactory' by the remaining. The educational content was rated as 'effective or very effective' in promoting substantial changes in clinical practice by 79 (75.9%) participants and as 'partially effective' by the remaining.

Phase II: assessment of the QMNC

Participants characteristics

Overall, 1050 mothers and 105 hospital staff responded the survey. Enrolment rate among the eligible was 50.5% for mothers and 77.2% for hospital staff (figure 1). The participants' characteristics are shown in table 1.

Among mothers, the median age was 33 years (range=18–59) and 91.0% had an Italian nationality. More than half

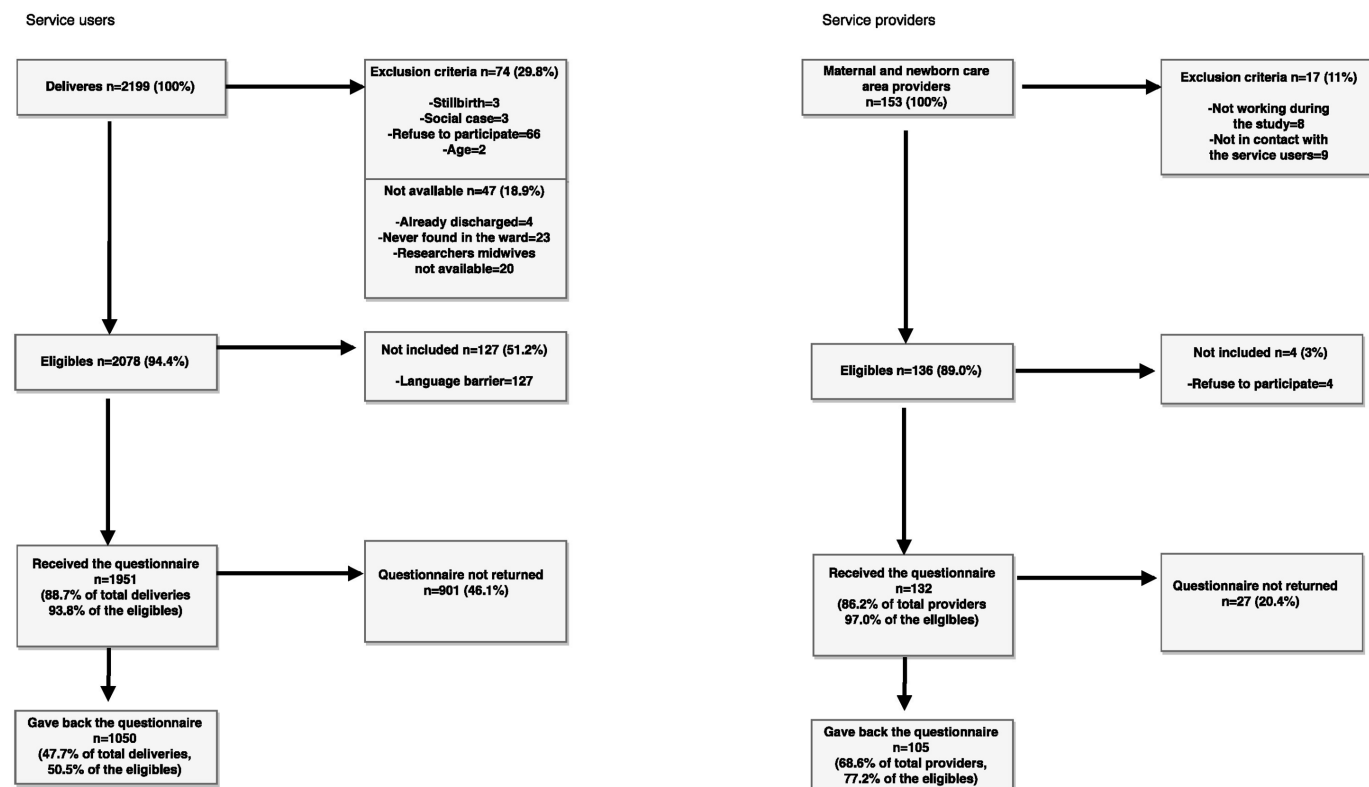


Figure 1 Flow diagram of service users and service providers.

Table 1 Characteristics of the survey respondents

	n	
	(n=1050)	%
Mothers		
Age, median (range)	33 (18–59)	
Education		
No formal education	1	0.1
Elementary school	3	0.3
Junior high school	85	8.1
High school	410	39.0
Bachelor's degree	387	36.9
Specialist degree	164	15.6
Italian nationality	956	91.0
Primiparous	540	51.4
Multiple pregnancy	15	1.4
Hospital staff	(n=105)	
Sex		
Female	93	88.6
Male	12	11.4
Occupation		
Midwife	36	34.3
Nurse	27	25.7
Obstetrician	15	14.3
Neonatologist	9	8.6
Midwifery student	9	8.6
Obstetrician resident	6	5.7
Neonatologist resident	3	2.9
Years of work in maternal and newborn care		
<1	7	6.7
<5	29	27.9
<10	14	13.5
>10	54	51.9

of mothers (51.4%) were primiparous, and 52.5% were highly educated (Bachelor's degree or specialist degree). Nearly all (98.6%) had a single pregnancy.

Among hospital staff, midwives and nurses accounted for 60.0% of the total sample, which was represented mostly (88.6%) by women. A significant proportion of staff (51.9%) had >10 years of work experience in maternal and newborn healthcare.

When compared with missing cases, the enrolled sample of mothers was similar (online supplementary table 5), except for a higher prevalence of multiparous women ($p=0.01$). There staff sample had a significant lower prevalence of obstetricians compared with missing cases ($p=0.01$).

Findings on quality of care

Table 2 presents key indicators collected with the mothers' questionnaire. The majority of mothers

(86.3%) reported timely care at hospital arrival and about two-thirds (65.2%) affirmed that had received clear information on arrival about what was happening. Almost one-third (28.4%) received more than five vaginal examinations and informed consent was asked in 83.5% of those procedures. Continuous cardiotocography during labour was performed in a high percentage (73.7%) of mothers, while about half (46.5%) declared restrictions to free movements during labour. Epidural analgesia was performed in 40.6% of women and the most frequent reason for not receiving it (46.7%) was absence of women request (despite knowing that there was the possibility of requesting one). Non-pharmacological analgesia was performed in 75.1%. Overall, 28.3% of mothers reported induction of labour. Caesarean section (CS) rate was 23.1%, with nearly all (98.8%) mothers reporting to have received proper explanation regarding reasons for CS, but only 88.9% declaring to have signed an informed consent. Kristeller manoeuvre was performed in 13.1% of women, while 18.3% received an episiotomy. The reasons for those procedures were properly explained for 51.9% and 77.7% of mothers, respectively. Restrictions to free movements during vaginal birth was reported by 24.0% of mothers and 69.3% reported that birth occurred in lithotomy position due to staff choice.

Regarding postpartum care, skin-to-skin contact, early breast feeding and rooming-in were reported by 80.8%, 67.2% and 88.1% of mothers, respectively. Exclusive breast feeding was reported by 78.0% of mothers and 65.8% received counselling and support. Only 47.2% of women felt adequately informed about newborn danger signs. Mothers reported that the informed consent before routine procedures of neonatal prophylaxis (conjunctivitis and neonatal haemorrhagic disease) was delivered in <15% of cases, while the consent for the screening for metabolic diseases was offered much more often (89.5%).

Regarding indicators of experience of care, 93.4% were always or often treated with dignity and respect, 90.7% had always or often their privacy and confidentiality preserved and 89.1% of mothers declared that always or often had an efficient communication with hospital staff. Coercion to accept proposed care, discrimination and abuse (verbal, physical or emotional) were reported as occurring always or often by 6.7%, 1.2% and 0.7% of women, respectively. Overall, about half mothers declared that had always or often a partner/companion with them during the whole process of care (50.7%).

In terms of physical structure, mothers rated the toilets, the basic infrastructure of the ward, illumination and general room comfort as excellent or good in 50.6%, 57.0%, 57.2% and 58.2%, respectively. General cleanliness was excellent or good for more than two-thirds of mothers (72.8%) and only 7.8% rated the spaces for caring the baby as inadequate.

Overall, 68.8% of mothers declared themselves highly satisfied with the health service and 79.3% would recommend it to friends and family.

**Table 2** Key indicators from mothers' questionnaire

Labour	N	%
Timely care at hospital arrival*	906	86.3
Clear information about what was happening*	685	65.2
Vaginal examination		
Number (≥5)	264	28.4
Informed consent*	776	83.5
Continuous CTG	685	73.7
Restrictions to free movements during labour*	432	46.5
Epidural analgesia*	377	40.6
Non-pharmacological analgesia in labour*	698	75.1
Labour induction	263	28.3
Birth		
Spontaneous vaginal birth*	703	66.9
Caesarean section*	243	23.1
Instrumental delivery*		
Vacuum extraction	91	8.8
Forceps	13	1.2
Invasive practices		
Kristeller manoeuvre	106	13.1
Episiotomy*	148	18.3
Reasons/risks and benefits/consent explained* for:		
Caesarean section*	240/211/216	98.8/86.8/88.9
Instrumental delivery*	83/43/50	79.8/41.3/48.1
Kristeller manoeuvre*	55/24/32	51.9/22.6/30.2
Episiotomy*	115/59/66	77.7/39.8/44.6
Restrictions to free movements during birth*	223	24
Lithotomy position at birth due to staff's request*	393	69.3
Postpartum care		
Skin to skin*	848	80.8
Early breast feeding*	706	67.2
Rooming-in*	925	88.1
Neonatal feeding during hospital stay*:		
Exclusive breast feeding	819	78
Counselling and support	691	65.8
Adequately informed about newborn danger signs*	496	47.2
Informed consent for:		
Neonatal conjunctivitis prophylaxis *	109	10.4
Neonatal haemorrhagic disease prophylaxis (vitamin K)*	143	13.6
Screening for metabolic diseases *	940	89.5
Experience of care* (always/often)		
Privacy and confidentiality respected*	952	90.7
Treated with dignity and respect*	981	93.4
Efficient communication*	936	89.1
Timely care*	912	86.9
Cultural and religious needs respected*	945	84.2

Continued

Table 2 Continued

Experience of care* (always/often)	N	%
Suffered from hunger or thirst*	859	81.8
Received emotional support*	849	80.9
Efficient handover*	828	78.9
Operators empathetic*	820	78.1
Adequately involved in the decision-making process*	788	75
Operators introduced themselves*	705	67.1
Partner/companion allowed during all hospital stay*	534	50.7
Felt coerced into accepting care suggested*	70	6.7
Felt discriminated*	13	1.2
Suffered abuse (verbal/physical/emotional)*	7	0.7
Physical structure	N	%
Excellent or good/fair/inadequate:		
Basic infrastructure of the ward*	598/288/164	57.0/27.4/15.6
Toilets*	532/288/230	50.6/27.4/21.9
Illumination*	600/327/123	57.2/31.1/11.7
General cleanliness*	765/209/76	72.8/20.0/7.2
General room comfort*	611/316/123	58.2/30.1/11.7
Area for caring the baby*	672/296/82	64.0/28.2/7.8
General satisfaction	N	%
Satisfied with the health service* (highly satisfied ≥ 8 in a proposed range from 1 to 10)	722	68.8
Would recommend childbirth in that facility*	833	79.3

*WHO quality standard.
 †CTG, cardiotocography.

Results on the survey on the hospital staff perspective are summarised in tables 3 and 4. Table 3 presents the frequency of non-evidence-based medicine (non-EBM) practices according to staff perspective. On these items there were significant differences on perceptions by type of professionals (online supplementary table 6), with professional for the neonatal area reporting overall a lower frequency of non-EBM interventions, except for routine newborn suctioning, mother/newborn separation and early bathing and removal of the vernix within 6 hours of birth.

As reported in table 4, perception of staff in regard to the availability of clinical protocols and training was overall poor. The percentage of staff reporting that updated clinical protocols and regular training were respectively available was: 22.3% and 5.9% for low-risk deliveries, 34.6% and 14.4% for low-risk newborn, 40.8% and 10.7% for obstetrics emergencies and 52.9% and 25.0% for neonatology emergencies. Simulation trainings (ie, skills and drills) were reported as rarely conducted: 9.7% for the skills related to the newborn at low risk, and 2.9% and 15.4% for the obstetrics and neonatology emergencies, respectively. However, significant differences were observed among staff groups in charge for mother or neonatal care (online supplementary table 6). The

physical structure was rate as appropriate by 26.2% of staff for the care of low-risk deliveries, and by 31.7% of staff for newborn at low risk.

Overall, 18.4% of staff reported that a health information system with regular data collection was available, and according to 16.3%, data were used for quality improvement purposes.

Regarding communication with mothers and families, 26.2% of hospital staff considered it adequate. Reasons for an inadequate communication are reported in online supplementary table 6. According to respectively 9.7%, 9.7%, 25.9% and 5.8% of staff regular training, updated protocols, health education materials and in-service supervision on communication skills were available. Handover was considered adequate by 43.3% of hospital staff. The availability of updated protocols for handover was reported by 11.5% of participants (significantly better for neonatal area staff) (online supplementary table 6).

In regard to respect and dignity during care, privacy and confidentiality of mothers was preserved according to 22.8% of hospital staff. Protocols to ensure privacy during care and protocols to prevent mistreatment and abuse were available according to 18.4% and 6.9%. Existence of in-service training and supportive supervision regarding women rights was reported by 8.3% of staff while 14.4%

Table 3 Non-EBM practices by area of care

	Always/often/sometimes N (%)	Never/rarely N (%)
Obstetric care		
Continuous CTG in low-risk pregnancy	57 (55.4)†	19 (18.4)
Restrictions to freedom of movement during labour	54 (52.4)†	32 (31.0)
Restrictions to position of women choice during birth	56 (54.9)†	24 (23.5)
Restrictions to oral intake (food, water) during labour without caesarean section risk*	43 (41.7)†	38 (36.9)
Labour augmentation*	47 (46.5)†	23 (22.8)
Instrumental delivery without indication*	46 (44.7)†	36 (35.0)
Episiotomy without indication*	44 (42.7)†	35 (34.0)
Kristeller manoeuvre	48 (46.6)†	30 (29.1)
Caesarean section without indication*	36 (35.0)	45 (43.7)
Routine pubic or perineal shaving*	13 (12.7)†	62 (60.8)
Enemas*	6 (5.9)	71 (69.6)
Neonatal care		
Immediate cord clamping (before 1–3 min) without neonatal emergency*	42 (40.7)†	49 (47.6)
Routine newborn suctioning*	48 (46.2)	43 (41.3)
Early bathing and removal of the vernix within 6 hours of birth*	72 (69.2)	19 (18.3)
Mother/newborn separation*	51 (50.0)	48 (47.1)
Formula feeding without medical indication*	41 (39.4)†	54 (52.0)

*WHO quality standard.

† Significant difference ($p < 0.05$) by professional type in the subgroup analysis (see online supplementary table 6).
CTG, cardiotocography; EBM, evidence-based medicine.

reported events of physical or verbal abuse from staff to mothers.

More than two-thirds (69.6%) reported that informed consent protocols were available, but one-third (32.4%) reported the availability of in-service training and supportive supervision on informed consent procedures. According to 38.2% of hospital staff choices and women preferences were respected (significantly better for neonatal area staff) (online supplementary table 6).

Overall, emotional support during birth was adequately provided to mothers according to 19.6% of staff. Training or in-service refresher sessions in providing emotional support or in-service training in pain relief (non-pharmacological or pharmacological) were reported by 5.9% and 15.7% of staff, respectively.

In terms of human resources management, 6.8% reported that the hospital had sufficient number of health professionals available while 11.8% reported that the institution encourages collaborative working practices (significantly better for neonatal area staff) (online supplementary table 6).

The existence of mechanisms for regular collection of provider satisfaction information was recognised by 2.9% of hospital staff. Most of hospital staff (62.0%) was satisfied with their job; 41.4% was considering changing job or hospital.

The majoring of staff stated that improving the QMNC, under different aspect (organisational issues, use of data, training, etc), was crucial (online supplementary table 7).

Findings on key WHO quality measures¹² explored from both mothers and hospital staff perspective are reported in online supplementary table 8. Significant differences were observed in the perception of staff (ie, the experience of delivering care) and mothers (ie, experience of receiving care), with staff overall perceiving the QMNC as worst compared with mothers.

Phase III: development of recommendations to improve the quality of care

Overall, 35 (92.1%) of the decision makers preidentified participated to the workshop for its full duration. The workshop run smoothly with a large active participation.

Table 5 reports the identified priority areas for actions and the 55 recommendations agreed to improve the QMNC, synthesised according the WHO Quality of Care framework for maternal and newborn health.^{11 12} Overall, recommendations developed covered all domains of the WHO framework. The number of recommendations developed by each group was similar. All groups prioritised actions related both to provision of care and experience of care, under the following domains: evidence-based practices; referral systems (continuity

Table 4 Key indicators from hospital staff questionnaire

Evidence-based practices	Care of low-risk birth N (%)	Care of low-risk newborn N (%)	Obstetrics emergencies N (%)	Neonatology emergencies N (%)
Perceived availability of updated clinical protocols*	23 (22.3)	36 (34.6)†	42 (40.8)‡	55 (52.9)†
Regular training*	6 (5.9)	15 (14.4)†	11 (1.7)	26 (25.0)
Proper equipment and supplies*	54 (52.9)	63 (61.2)	71 (68.9)‡	89 (85.6)
Adequate physical structure*	27 (26.2)	33 (31.7)	–	–
Skills and drills/in-service training*	–	10 (9.7)†	3 (2.9)	16 (15.4)
Health information system			N (%)	
Regular data collection*			19 (18.4)	
Use of data for quality improvement*			17 (16.3)	
Maternal/perinatal deaths and near miss review meetings*			24 (27.6)	
Communication				
Adequate communication with mothers and families*			27 (26.2)	
Regular training*			10 (9.7)	
Updated protocols for interpersonal communication*			10 (9.7)	
Health education materials*			22 (25.9)	
In-service supervision*			6 (5.8)	
Adequate handover*			45 (43.3)	
Handover protocols*			12 (11.5)†	
Adequate communication system for multiprofessional care*			27 (26.5)	
Respect and dignity during care				
Physical structure for privacy and confidentiality*			23 (22.8)	
Protocols to ensure privacy*			19 (18.4)	
Mechanisms to identify event of violation of privacy*			15 (14.6)	
Protocols to prevent mistreatment and abuse*			7 (6.9)	
In-service training and supportive supervision regarding women rights*			6 (8.3)	
Mechanisms to identify an event of mistreatment*			35 (34.7)	
Events of physical or verbal abuse*			14 (14.4)	
Informed consent protocols*			71 (69.6)	
Standard informed consent forms*			82 (79.6)	
In-service training and supportive supervision for informed consent procedures*			33 (32.4)	
Mechanisms to identify an event of denied informed choice*			21 (21.6)	
Choices and preferences respected*			39 (38.2)†	
Partner/companion of woman choice encouraged*			62 (60.8)	
Training or in-service refresher sessions in providing emotional support*			6 (5.9)	
Emotional support*			20 (19.6)	
In-service training in pain relief (non-pharmacological or pharmacological)*			16 (15.7)	
Human resources management				
Sufficient number*			7 (6.8)	
Continuing professional and skills development programme*			16 (15.5)	
Mechanisms for evaluation and for recognising good performance*			4 (3.9)	
Encouragement to collaborative group practices*			12 (11.8)†	
Received a clear job description*			26 (25.7)	
General satisfaction				
Mechanisms for regular collection of provider satisfaction information*			3 (2.9)	
Mechanisms for regular collection of patient satisfaction information*			24 (23.1)	
Highly satisfied*			15 (14.3)	

Continued

Table 4 Continued

General satisfaction

Satisfied*	65 (62.0)
Considering change job or hospital*	43 (41.4)

*WHO quality standard.

†Significant difference ($p < 0.05$) by professional type (bigger from neonatal area—see online supplementary table 6).

‡Significant difference ($p < 0.05$) by professional type (bigger from maternal care area—see online supplementary table 6).

of care); effective communication, respect and dignity; emotional support. As expected for the instructions given (online supplementary table 4), few recommendations related to human resources or physical resources. Many of the recommendations developed implied training (ie, on evidence-based practices, effective communication, respect and dignity, emotional support).

In order to implement the recommendations developed, it was proposed to establish technical working groups, and to use the recommendations agreed to inform the development of the official hospital working plan for the next biennium.

DISCUSSION

To our knowledge, this is the first study reporting on the practical use of the WHO standards for improving the QMNC. The study shows that, in the given setting, it was feasible to collect many of the WHO quality measures, using both service users and service providers as sources of data. The complementary views of service users and service providers are both relevant to build an informative picture of the QMNC. Including both perspectives may increase local ownership, participation and commitment to change among both hospital staff and the community. Other authors recognised the importance of monitoring quality along the continuum of care using different perspectives.^{29–31}

Most importantly, the study showed that the WHO standards can be effectively used to develop recommendations to improve quality of care. Most recent studies only captured few aspects of the ‘experience of care’ and none explicitly used findings to improve hospital practices.^{32–35} This pilot study is an example of how, using the WHO standards, a large amount of data can be collected and used for quality improvement purpose.

In regard to quality of care indicators, our overall findings are not surprising. As reported in a recent systematic review, mistreatment around the time of childbirth has been reported in many different settings.¹⁹ Large surveys in the USA, the UK and Brazil showed frequent gaps in the QMNC.^{21 23 36 37} According to last UK NHS (National Health Service) maternity services survey, around 30% of mothers were not free to move and could not choose the most comfortable position during labour.³⁶ In the USA only 60% of women reported ‘rooming-in’ during hospital stay, and only 50% reported feeding their babies with breast milk 1 week after giving birth.²¹ Previous assessment in Italy also showed quality gaps despite some

improvements of practices in recent years, that is, episiotomy are current in a reduction trend (in 2002, 69%; in 2011, 42% of vaginal births).^{24–26} However, in Italy, the WHO standards were never comprehensively evaluated before.

Of notice, it is important to remember that the surveys reported the ‘opinion’ of people, and not necessarily this is the objective true. For example, despite staff reported a low availability of clinical protocols, it was verified that protocols in most cases were actually available; the survey aimed at collecting information on the level of diffusion of the protocols and on staff awareness, rather than the actual protocol existence. In particular in projects aiming at changing behaviours, gathering information about opinions and view of key actors can be equally important as true facts. Opinions of both service users and service providers cannot be dismissed, even if not consistent with reality.

Interestingly, opinions of service users and service provider were not always consistent. For example, indicators of the experience of care among mothers were actually better than what perceived by health staff (online supplementary table 8). The perception of the quality of care delivered can affect staff motivation and a misperception of low quality of care can actually negatively affect team performance and dynamics. We suggest that the experience of delivering care should be added in the WHO Quality of Care framework for maternal and newborn health,¹¹ and it should be more explored in future studies. To conclude, when aiming at collecting a comprehensive picture on the hospital QMNC, we recommended to ensure triangulation of data from multiple sources (such as, data from service users, service provider and objective data from direct evaluation for the assessment of facility resources (ie, protocols, availability of training and physical structure). This will provide a comprehensive picture of the QMNC.

When interpreting results of this survey, as of similar surveys conducted in other settings, we believe it is important to avoid blaming of single individuals or groups of people. There is a large range of underlying reasons that may determine the actual practices observed. A recent systematic review showed that there are at least three levels of factors influencing the attitudes and behaviours of maternal and neonatal care providers and, subsequently, affecting the QMNC and the final health outcomes: (1) an individual level (eg,

Table 5 Recommendations and actions agreed to improve quality of hospital care

Key recommendations and actions agreed		Obstetrics	Managers
Domains of QMNC	Neonatology		
Provision of care			
Evidence-based practices	<p>Staff training</p> <ol style="list-style-type: none"> 1. Organise regular high fidelity certified simulation training, with skills and drills and clinical case discussion, on the care of both newborn emergencies and low-risk newborn. 2. Develop mechanisms to ensure that training is mandatory for all staff in charge of newborn care. 3. Offer retraining course on a regular basis (every 6 months) to retain skills. 4. Implement the regional course on breast feeding, (delivered according the problem-based learning methodology). 5. Create a specific prescription system for formula milk: (a) only on medical prescription; (b) if on maternal request, undersigned by the mother; (c) monitor that all formula prescriptions by doctors are according to justified medical reasons. 6. Mandatory course for all staff working in the delivery room on the immediate postpartum care (including skin-to-skin, etc). 	<ol style="list-style-type: none"> 1. Implementation of a monitoring system to assess and ensure health professionals' skills and competence acquisition linked to continuous education. 2. Protected time for training, with a more stringent application of the national legislation. 3. Training of staff using the problem-based learning methodology. 	
	Local protocols		
	ND	<ol style="list-style-type: none"> 6. Create working group with protected time for protocols development and equal distribution of duties. 7. Develop a protocol for the care of physiological pregnancy and define responsibilities by type of professionals. 	<ol style="list-style-type: none"> 4. Internal inquire on existent protocols (content, date of last update). 5. Definition of standards and mechanisms for the development and for the diffusion of protocols. 6. Implementation of new methods for protocols diffusion (ie, use on clinical audits).
	Research		
	ND	ND	7. Activation of research networks/studies on quality of maternal and neonatal care.
Actionable information systems	Data collecting system	<ol style="list-style-type: none"> 8. Implement the use of the same patient information file in the obstetrics and neonatal wards. 9. Define working group with dedicated time for monitoring data with quality improvement purposes (mixed professionals, for clinical units, epidemiology, directions). 10. Maternal and neonatal mortality audits. 11. Organise regular meetings to discuss statistics and their use for quality improvement. 	<ol style="list-style-type: none"> 8. Review of existent databases and harmonisation among different databases. 9. Regular structured meetings to discussion database findings.
Referral systems	Continuity of care	<ol style="list-style-type: none"> 7. Shared protocols with outpatient health services. 8. Information folders and posters for mothers, developed in collaboration with antenatal outpatient services, to be diffused both a outpatient level (ie, antenatal courses), and inpatient level (US control, hospital website). 9. Participation of hospital staff to the delivery of the antenatal training courses for mothers at outpatient level. 	<ol style="list-style-type: none"> 10. Implement regional network on high-risk pregnancies. 11. Improve collaboration with outpatient care service on creating systems for emotional support of women.

Continued

Table 5 Continued

Key recommendations and actions agreed		Obstetrics	Managers
Domains of QMNC	Neonatology		
Human resources	Availability of skilled professionals 10. Rearrange distribution of human resources (doctors and nurses) within the hospital. Supportive systems ND	ND 13. Periodic (every 3 months) appraisal with a supervisor to monitor the achievement of the professional goals. 14. Regular meetings for discussing mechanism to ensure professional growth of staff and career development.	ND 12. Implementation of multiple communication strategies (face-to-face, email, poster, WhatsApp) to improve internal communication among professionals. 13. Clear identification from each unit of specific quality improvement activities as goal for the budget of the incoming year.
Physical resources	ND	ND	
Experience of care			
Effective communication	Staff training 11. Training for all staff on counselling and communication.	15. Define working group to develop strategies to improve effectiveness in professional communication. 16. Training events and in-service training on strategies to overcome common communication gaps, within year 2018. 17. Monitoring of effectiveness of the training with a before and after questionnaire for both service providers and users. 18. Regular use of techniques such as staff filming to evaluate, discuss with a non-blaming attitude, the quality of communication.	See recommendations #12.
Respect and dignity	Supportive information to mothers 12. See recommendations #8 and #9. 13. Information video for mothers. 14. Reactive guided visits for pregnant women to healthy newborn ward. 15. Develop written information on newborn danger sign, to be distributed together with discharge letter and on the hospital website. Develop information folders for mothers, and checklists on the correct information for staff on high-risk conditions during pregnancies.	19. Develop information folders for mothers, and checklists on the correct information for staff on high risk conditions during pregnancies. 20. Organise, every 2 months, meetings with mothers to inform them regarding key procedure associated with emergency obstetric care (eg, informed consent for operative delivery, epidural analgesia). 21. Organise weekly meetings open to pregnant women on key aspects of antenatal diagnosis.	14. Development and diffusion of informative video for mothers and families (eg, antenatal care practices, labour and postpartum care) within year 2018.
Emotional support	Staff training See recommendations #11. Other ND Staff training See recommendations #6. Other aspects of organisation of care 16. Add a clinical psychologist in the neonatal team composition (from antenatal to postpartum care).	See recommendations #15 to #18. ND See recommendations #5. See recommendations #5.	15. Training of staff on women/patient rights. 16. Curtain's installation between beds on puerperium wards. See recommendations #3. See recommendations #12: 17. Collaboration with local peer-to-peer women's support group.

Continued

Table 5 Continued

Key recommendations and actions agreed			
Domains of QMNC	Neonatology	Obstetrics	Managers
Human resources	See recommendations #16.	ND	ND
Physical resources	General comfort of wards	ND	18. Improve acoustic and illumination in the wards.

ND, not directly discussed; QMNC, quality of maternal and newborn care; US, ultrasound.

stress, fatigue, training, motivation); (2) an organisational level (eg, workload, working hours, support supervision, public or private sector); (3) a societal level (eg, cultural beliefs and context).²⁰ Chancing these attitudes and behaviours required times, resources, effective leadership and coordination and a series of activities. Interestingly, the survey among staff revealed that staff actually perceived the need to improve QMNC (online supplementary table 7).

In terms of additional lessons learnt, we believe that sensitisation (training provided in phase I, and adequate sensitisation of decision makers before phase III) was a crucial aspect of the study, which cannot be dismissed in future similar projects. Request for additional training was also one of the most frequent point raised in the recommendations. In regard to the training, attention should be given to the importance to include all type of professionals, including doctors and decision makers. In delivering the training, the trainers should be aware of local context (eg, dominant cultural stereotypes) and able to manage possible related discussions. Providing a framework of underlying causes for women mistreatment²⁰ and recognising ‘system’ causes, was in our experience extremely helpful, to mitigate both resistance from health worker in recognising the problem, and a diffuse sense of guiltiness. On the other hand, we felt that recognising objective difficulties, providing a supportive approach and appreciating any positive attitude towards change was important, as for any quality improvement intervention. Finally, future surveys may consider a smaller sample size, and invest more in follow-up on the implementation of the recommendation.

We acknowledge a number of limitations of this study. This is a pilot study in one single facility, and it will be important to replicate similar studies in other settings to evaluate generalisability of findings. The mothers’ questionnaire could not be translated in any foreign language (in Italy there is a multitude of ethical minorities and costs associated were not negligible), thus the findings of the survey are not generalisable to the views of the non-Italian speakers’ mothers. An evaluation on the experience of care among immigrants’ non-Italian speaker mothers would deserve a dedicated study. Enrolment rate in the mothers’ survey (50.5% of the eligible), although it may appear low, was in general similar or even larger to other surveys (USA=45%, UK=37%).^{21 36} In regard to the slight imbalances in the characteristics of the sample when compared with missing data (online supplementary table 5) with a significant higher number of multiparous women among the enrolled cases, evidence do not associate the number of previous pregnancies with satisfaction with prenatal and delivery care in Italy.³⁸ On the other hand, it is possible that the relatively low number of obstetric physicians could have affected some results. We recommend, for future surveys, to put in place actions to mitigate any risk of selection bias.

Finally, we acknowledge as limitation that mothers' representatives were not invited to the final workshop for development of recommendations. Involvement of patients group is still not a common practice in Italy, and more should be done to increase their engagement in policy development. Although recommendations agreed to improve the QMNC of care did not cover all gaps identified, and not all recommendations were measurable or time-bounded,²⁸ the awareness of quality issues and the planning exercise conducted—providing to a relatively large number of high-level staff the opportunity of meet and discuss together problems and solutions on QMNC in a participatory manner—may have actually positively affected indirectly also other behaviours and institutional dynamics. Lastly, we fully acknowledge that this study included only one cycle of measurement (one of service users and one of staff), while it would be very useful to know if there is progress with implementation. However, on a practical basis, adequate time need to be allowed to implement the agreed recommendations. We believed that, given the lack of studies documenting the use of the WHO standards up to the stage we reached (ie, developing the recommendations), it is important to disseminate now the results achieved, as they may be an useful information for researcher and policy maker. If possible, we will seek to follow-up on this experience by documenting in another paper the number of recommendations effectively implemented, and the trends in the indicators measured.

Conclusion

This study reported a practical use of the WHO standards for improving quality of care in a hospital setting using both service users and service providers as sources of data. Data collected in this way proved to be useful for planning interventions to improve the QMNC in a proactive and participatory manner.

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